#  <br> STARTER PROGRAMS 

FROM


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FOR
APPLE, ATARI, COMMODORE 64 and VIC-20, TI, TIMEX and TRS-80


# TABLE OF CONTENTS 

 1INTRODUCTION: STARTING TO PROGRAM
1
THE ABC's OF PROGRAMMING IN BASIC
APPLE PROGRAMS
15
ATARI PROGRAMS

# 28 <br> COMMODORE 64 AND VIC-20 PROGRAMS 

42
TEXAS INSTRUMENTS PROGRAMS
57
TIMEX PROGRAMS
TRS-80 PROGRAMS

## STARTING TO PROGRAM

You've probably heard that computers are dumb. In a sense they are-they don't know anything until a human comes along and tells them what to do. Telling a computer what to do is called programming. It's not hard to learn to program. One way is by learning BASIC, one of the many languages used by humans, to talk to computers. The programs in this book are all written in BASIC.

When you program, some keys and parts of your computer keyboard are especially important. Be sure you can locate the quotation mark and the semicolon, and that you know how to space both forward and backward.

The chart below tells you how to make your particular computer do certain things when you program. It also lists some common commands. Commands are the words you key in when you want to tell your computer to do something. It also lists what your computer will tell you to let you know you've made a mistake in your typing. The most important thing to keep in mind when you're talking to your computer is that you must be precise. The computer will try to do exactly what you tell it, so you must be careful to tell it exactly what you want it to do.

## THE ABCS OF PROGRAMMING IN BASIC

This chart tells you what to look for, what to key in, or what something on your screen means.

| THE SIGN OR DIRECTION | APPLE | TIMEX | TI | ATARI | commosiore | TRS-80 |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| Indication of next symbol | flashing <br> cursor | cursor | flashing <br> cursor | cursor | flashing <br> cursor | flashing <br> cursor |
| To correct | backspace | delete | backspace | delete/ <br> backspace | insert/ <br> delete | backspace |
| To enter a command | RETURN | ENTER | ENTER | RETURN | RETURN | ENTER |
| Mistake in command | SYNTAX <br> ERROR | SYNTAX <br> ERROR | INCORRECT <br> STATEMENT | ERROR | SYNTAX <br> ERROR | SYNTAX <br> ERROR |
| To clear screen | HOME | CLS | CALL <br> CLEAR | PRINT <br> CHR\$ (125) | PRINT <br> CHR\$ (147) | CLS |
| To indicate new program | NEW | NEW | NEW | NEW | NEW | NEW |
| To print something | PRINT | PRINT | PRINT | PRINT | PRINT | PRINT |
| To see all the commands in a program | LIST | LIST | LIST | LIST | LIST | LIST |
| To make the program do what <br> you've told it to | RUN | RUN | RUN | RUN | RUN | RUN |
| To indicate end of program | END | STOP | END | END | END | END |
| To stop program | CONTROL/ | BREAK | FUNCTION/ | BREAK | RUN/STOP | BREAK |

AFFIEE II FLUS AND AFFLEE IIe
Bonus Frogram \#1 CAFTOON FOBOT

Fiddle: What's sweet, but square: high tech, yet down to earth: and brilliant, with the I. 0 . of a doughnut?

Give up?
The answer is: The fabulous kISSING FOEOT.
You'll key in a program using FOF and NEXT to make a cartoon. The command FOF and NEXT are used for counting.

14 HOME


32 HOME
उ4 FFIINT "()***********()"
उ6 FRINT "** **"
Ⓑ FFiINT "** (口) (-) **"
40 FFiNT "** **"
42 FFint "** $v$ **"
44 FRINT "** **"
46 FFind "*****"
48 FOR $T=1$ TO 75: NEXT T
50 HOME
52 FFiINT "()***********()"
54 FFINT "** **"
56 FFiINT "** (0) (0) **"
58 FFiINT "***"
60 FFiINT "** $V$ **"
62 FFiINT "** **"
64 FFiINT "** $\quad$ * **"
66 FOF $T=1$ TO 75: NEXT T
68 GOTO 14

This program works like a real cartoon. The robot is printed on the screen, and erased, three times. Each time it is printed, there are small changes made, which give the illusion of movement. Line 68 GOTO 14 starts the entire process over again. The FOF/NEXT commands are used as time delays between pictures. You can change the speed of the cartoon by changing the 75 , in the FOF/NEXT lines, to a different number. Decreasing the number will make the cartoon faster.

AFFLE

Eonus Frogram \＃2 FAMILY DECISION MAKEEF

How would you like to use your home computer for solving
 Bobby？＂．．．or how about，＂Should we use the t．v．to watch a movie，or play with the computer？＂．The FAMILY DECISION MAKEE can help you solve these problems，and more．It will make the decision for you，by picking a random choice．All you have to do is to type in the options．

10 HOME
20 FFINT＂FAMILY DECISION MAKEF＂
30 FOF $T=1$ TO 1500：NEXT T
40 HOME
50 FFINT＂TYFE IN THE OFTIONS＂
6ロ FFINT＂AND THE COMFUTER WILL DECIDE＂
70 INFUT＂WHAT IS OFTION \＃1＂：O1丰
80．INFUT＂WHAT IS OFTION \＃2＂： $12 ⿻=2$
90 FFIINT＂I＇M THINKING IT OVEFi．．．．．．．＂
100 FOR $T=1$ TO SOQO：NEXT $T$
$110 \mathrm{C}=\mathrm{INT}(\mathrm{FND}(1) * 2)+1$
120 HOME
1ミ0 FFINT＂MY CHOICE IS：＂
140 IF $C=1$ THEN FRINT O1丰
150 IF $C=2$ THEN FFINT Q2丰

In this program the computer makes its choice in line 10. Lines 90 and 100 are where the computer is，＂thinking it over＂．You probably noticed that the computer isn＇t really ＂thinking it over＂．It＇s actually counting up to 3000 ，then executing line 110 ．The choice is printed on the screen in 1ines 130－150．

The VARIAELES are：
T＝time delay
C＝choice
O1：$=$＝option \＃1
02s＝option \＃2

AFFLE
Bonus Frogram \＃s FEACTION TIMER
Here is a program to test your reaction time．When the computer says＂GO！＂，you must hold down CONTFOL and press the RESET sey as quickly as you can．Compare your score with the chart in the program．Good luck！

10 HOME
20 FFINT＂TEST YOUR REACTION TIME＂
B FFINT＂AGAINST THE COMFUTEF．＂
40 FFINT＂WHEN THE COMFUTEF SAYS＇GO！＇＂
50 FREINT＂HOLD CONTROL \＆FRESS RESET KEY＂
60 FRTNT＂YOUF SCOFE IS THE HIGHEST NUMEER YOU SEE＂
70 FRINT：FFINT＂Q1－10＝LIGHTNIN＂ $10-20=0 U I C K!"$
80 FFINT＂20－30＝AVEFAGE $30-50=N A F F I N G "$
90 FRINT：FRINT：FRINT＂FRESS RETURN＂
100 FFINT＂WHEN YOU AFE READY＂
110 INFUT A⿻三丨⿻二丨冂刂
120 HOME：FFINT＂ON YOUF MARE＂
1 SO FOR T＝ 1 TO 1000：NEXT T：FRINT＂GET SET！＂
140 FOF：$T=1$ TO TNT（FND（1）＊5®00）：NEXT T
150 HOME：FRINT．＂GO！＂
160 FOR $T=1$ TO 50：FFINT T：NEXT T
170 FFINT＂SOMEONE WAKE THIS FERSON UF！＂
The VAFIAELE，of the FOF／NEXT statement in line 140 ，equals a FANDOM INTEGEF between one and five thousand．This causes the time delay to be different each time the program is fun． When you press the RESET key the computer may say，＂Break in 160＂．This is normal for the program．Your score is the highest number you see．Type FUN and press FETURN to play again．

AFPLEE

Eonus Frogram \#4 MaF.G. FECOFDEF
If you're like me, you never take the trouble to figure out your car's miles per gallon (M.F.G.). Even having a calculator handy has never helped, though there are only three basic numbers to calculate. This is one more instance in which wanting to use my computer motivates me to do the fairiy simple task: I've managed to ignore. My mechanic tells me that $I$ should check my. M.F.G. after every five fill-ups: That way, if my M.F.G. starts dropping, I can take my car in for a checkup...before it's too late.

10 HOME
20 FFINT "MFG CALCLILATOF"
$\Xi \because F O F T=1$ TO $T=00: N E X T T$
40 HOME
50 FFIINT "THIS IS A FFOGFAM TO FIGUFE OUT"
GO FFINT: "THE MILES FER GALLON YOUR CAFi GETS"
70 FFINT "HOW MANY MILES HAVE YOU DFIVEN"
80 FFIINT "DUFING THE FAST FIVE FILL-UFS"
90 INFUT M
100 FFIINT "HOW MANY GALLONS OF GAS DID YOU USE"
110 FFINT "IN THE FAST FIVE FILL-UFS"
120 INFUT $G$
$130 \mathrm{MFG}=M / G$
140 FFiINT "YOU HAVE EEEN GETTING "MFG
15ロ FFIINT "MILES FER GALLON"
Notice that we used $G$ as the VAFIAELE for gas, M as the VAFIABLE for miles, and MFG as the VAFIABLE for miles per gallon. In line $1 \leq \square, M F G=M / G$ means miles per gallon equals miles divided by gallons.
$A F^{\prime} F^{\prime} L E$

## Bonus Frogram \＃5 COUFON CALCULATOF

Computers are pretty good at solving problems and presenting the results in a manner which is easy to read． This program can be used to display the amount of money you will save with your shopping coupons．

10 HOME
20 FFINT＂COUFON CALCULATOF＂
SO FFINT：FRINT＂TO FIND OUT HOW MUCH YOU＇LL SAVE＂
40 FFIINT＂WITH YOUFF SHOFFING COLFONS＂
50 FFINT＂ANSWEFR THE FOLLOWING OUESTIONS＂
60 FFINT＂THEN FFESS THE FETUFN ドEY＂
$7 \square$ FFIINT：FFINT＂HOW MANY COUFONS DO YOU HAVE＂
80 INFUT C
90 FFINT：FFINT＂ENTEF THE AMOUNT OF A COUFON＂
$10 \square F F I N T$＂DON＇T USE A DOLLAF SIGN＂
110 FFINT＂DO USE A DECIMAL FOINT＂：FRINT
120 FOF E $=1$ TO C：FFINT＂ENTEF VALUE OF COLFON\＃＂E
13 INFUT A
$140 T=T+A$
150 NEXT E
160 FFIINT：FFIINT＂丰＂T＂．WILL EE SAVED＂
The VAFIABLES in this program are：
C＝number of coupons
$E=$ coupon\＃
$A=$ value of coupons
T＝total value of coupons
Line 140 adds up the total，each time a value is entered into the computer．Line 160 prints the total value to be saved．

AFFLE
Bonus Frogram \#6 SFOFTS FOFECASTEF
The SFORTS FORECASTER can be a handy program if you enjoy sports. This program will take a team's current record and project, based on winning percentage, what the team's record will be at the end of the season.

10 HOME
20 PRINT "SFPORTS FOFECASTEF"
30 FOF $Z=1$ TO 1500:NEXT Z:FRINT
40 FRINT "THIS FROGFiAM WILL FOFECAST A TEAM'S"
50 PRINT "FINAL WIN AND LOSS FECORD"
60 PRINT "BASED ON ITS CURFENT RECOFD"
70 PRINT:FRINT "ANSWER EACH QUESTION"
80 FRINT "THEN FFESS FETURN"
90 PFINT:PRINT "HOW MANY GAMES DOES THE TEAM FLAY"
100 INFUT T
110 FRINT:FFINT"HOW MANY WINS DO THEY HAVE NOW"
120 INFUT W
130 FRINT "HOW MANY LOSSES DO THEY HAVE NOW"
140 INPUT L
$150 \mathrm{~F}=\mathrm{W} /(W+L): Y=T * F: D=T-Y$
160 FRINT:FRINT "END OF THE SEASON FROJECTION: "
170 FRINT:FFINT "WINS="INT(Y)" LOSSES="INT(D) +1
The VAFIABLES are:
$Z=t i m e ~ d e l a y ~ v a r i a b l e ~$
T=total games in season
W=games won
L=games lost
$F=p e r c e n t a g e$ of games won
$Y=e n d$ of year games projected won
$\mathrm{D}=$ end of year games projected lost
The forecast is completed in line 150 when the winning percentage (F) is established by dividing the number of completed games ( $W+L$ ) into the total games won so far (W). The total wins for the year is estimated by multiplying the amount of games in the season ( $T$ ) by the winning percentage (F'). The year end losses are determined by subtracting the end of year projected games won ( $Y$ ) from the total games in the season ( $T$ ).

AFFLE

## Eorius Firogram \＃7 SHOWEF MONITOF

Getting into the shower，day after day，and finding cold water can be a drag．I＇m sure that large families know what I＇m talking about：Eonus Frogram \＃7 has been designed to whip，morning bathroom confusion．It＇s called the SHOWEF MONITOFi．You type in the names and the computer picks the shower order．

10 HOME
2ロ FFFINT＂SHOWEF MONITOF＂
$\Xi \square$ FOF $T=1$ TO 2ロロロ：NEXT T：HOME
4』＂FFIINT＂THIS FFIOGFAM IS DESIGNED TO HELF＂
Sロ FFIINT＂FAMILIES DECIDE，IN A FAIF WAY＂
GØ FFFINT＂THE DFDEF IN WHICH THE SHOWEF IS USED＂
70 FRINT＂IN THE MORNING．＂
8ロ FFIINT：FRINT＂EACH FEFSSON＇S NAME IS TYFED INTO THE＂
90 FFIINT＂COMFUTER．THEN THE COMFUTEF，FIANDOMLY，＂
1Øロ FFIINT＂CHOQSES THE OFIDEF（AS IF OUT OF A HAT）．＂
110 FFINT＂TYFE EACH ANSWEF，THEN FFESS FEETUFN．＂
120 FFIINT：FFIINT＂HOW MANY FEDFLE IN YOUF FAMILY＂
130 INFUT $F$
140 FFIINT：FFINT＂TYFE IN THE NAMES，ONE AT A TIME．＂
150 FFINT＂THEN FFEESS FETUFN．＂
$160 . F O F H=1$ TO $F$
170 INFUT N末（H）
180 NEXT H
190 HDME：FFIINT＂THIS IS THE SHOWEF OFDEFI TODAY：＂
2ロロ FFINT：FOF $F=1$ TO $F=$
$21 \emptyset X=I N T\left(F N N D(1) * F^{\prime}\right)+1$
220 IF N丰 $(X)="$ THEN 210
$2 \Xi$ FFIINT N丰（X）
240 N丰 $(X)=" "$
250 NEXT $F i$
260 GロTO 260

The VAFIIAELES are：
$F=$ number of people in family
H＝array parking lot\＃
$X=r$ andom number
$N \neq(X)=n a m e$ of person $X$ in array
$F$＝counting variable
You are probably wondering what an AFiFiAY is．An AFifiAY is a computer parking lot．In an AFifiAY you don＇t park cars． Fiather，you park：words and numbers．In this program we parked the name of each person in an AFFAY location（such as $N \neq(1)=" M o m ", N \neq(2)=" L a r r y ", N \neq(\Xi)=" F i c k ", e t c)$ ．The names are loaded into the AFFiAY in lines $160-180$ ．The FANDOM shower order is determined in lines 200－250．Can you figure out why a name isn＇t picked more than once？

AF＇F＇LE

## Eonus Firagram \＃8 NUMEEF GAMES FOF TWO

Computers are great for playing games．They can be programmed to make games，both unpredictable and exciting． Here is a super game for two people．The computer＂pulls a number out of its hat＂，and the players take turns trying to guess the number．The player with the most correct guesses， after seven rounds，is the champ：Switch sides after seven rounds．You will be surprised at the strategies involved．

10 HOME
20 FFINT＂THIS IS A NUMEEF GAME FOF TWO FEOFLE＂
$\because 0$ FFINT＂THE COMFUTEF FICFES A NUMEEF EETWEEN 1 AND $5 D O . "$
40 FFINT＂THE FLAYEFS TAFE TUFNS GUESSING THE NUMEEF＂
50 FFIINT＂UNTIL SOMEONE GUESSES THE NUMEEF＂
60 FFINT＂THE FLAYEF GUESSING THE MOST NUMEEFS，＂
70 FFINT＂AFTEF 7 FOUNDS，IS THE WINNEF＂
80 FFIINT：INFUT＂WHAT IS FLAYEF \＃1＇S NAME？＂；FI\＆
90 FFINT：INFUT＂WHAT IS FLAYER \＃2＇S NAME？＂F2． 2
$100 \mathrm{~F}=\mathrm{Fi}+1: N=I N T$（FND（1）＊500）＋1
110 IF F $\triangle 1$ THEN FFINT＂THE SCOFE IS＂F1束＂＝＂F1＂＂F2\＆＂＝＂F2
120 FOF $T=1$ TO $25 \square \square$ NEXT $T$
$130 \mathrm{IFF} \boldsymbol{\circ} \mathrm{F}$ THEN 260
$140 \mathrm{FOF} T=1 \mathrm{TO} 1000:$ NEXT $T$
150 HOME ：FFINT＂FIOUND＂F＂＂，＂FI末＂＇S TUFN＂
160 FFIINT：INFUT＂WHAT IS YOUF GUESS？＂：G1
170 IF G1 \＆N THEN FRINT＂TOO LOW，＂F1：末：GOTO 2ロ0
180 IF G1 $\geqslant \mathrm{N}$ THEN FFINT＂TOO HIGH＂：GO TO 2DO
190 FFIINT＂YOU GOT IT＂F1：：F1＝F1＋1：GOTO 100
20ロ FOF $T=1$ TO 1ロロロ：NEXT T
210 HOME：FFINT＂FOUND＂F＂，＂F2ま＂＇S TUFN＂
220 FFINT：INFUT＂WHAT IS YOUF GUESS？＂G2
2ロO IF G2 \＆N THEN FFINT＂TOO LOW＂』GOTO 140
240 IF G2 $\geqslant \mathrm{N}$ THEN FFINT＂TOO HIGH＂：GOTO 140
2SQ FFINT＂YOU GOT IT＂F2w：F2＝F2＋1：GOTD 1日も
260 HOME：FOF $T=1$ TO 1OOQ：NEXTT T
270 IF F1 $\%$ F2 THEN FRINT F1丰＂CFEAMED＂F2丰＂＂F1＂TO＂F2：END
2BD FFINT F2क＂WASTED＂FI丰＂＂F2＂TO＂F1
The VAFIAELES are：
Fiw＝player \＃1
F2＊＝player \＃2
Fi＝player 林 score
F2＝player \＃2 score
G1＝player \＃1 guess
G2＝player \＃2 quess
Fi＝round\＃
T＝time delay variable
$N=s e c r e t$ number
The secret number（N）is picked in line 100．To alter the
limits of the secret number，you can change the 500 to a
larger or smaller number：Try 10000，for instance．In
several places you may notice symbols lite this：$\quad$ or
this：＊The symbol $\because$ means＂greater than＂and ：
means＂less than＂．Can you make this game work with four
players？

AFF＇LE

Eonus Frogram \＃9 FFiACTICAL JOFEF：

Are you ready for some laughs？If so，Eonus Frogram \＃9 $i s$ the one for you．It＇s called the FFiACTICAL JOKE FROGFiAM． Here＇s how it worl：s：

You type the program into your computer while the victim isn＇t around．FUN the program．The computer will ask you questions about the victim．You answer all the questions until the computer says，＂FRESS ANY KEY TO STAFT THE JOKE＂． Fress a key and the joke is ready for the victim．When the victim comes back，the computer will seem to know all about him／her．Just say that you＇re hooked up to the MASTEFi COMPUTEF，and it knows EVEFYTHING！！！

10 HOME
2Ø F＇RINT＂FFiACTICAL JOKE FROGFIAM＂
$\Xi \square$ FOR $T=1$ TO 1ロロロ：NEXT T
40 HOME
50 INFUT＂WHAT IS THE VICTIM＇S NAME＂；N夆
6Ø INFUT＂IS THE VICTIM MALE OFi FEMALE＂：MF：
70．IF MF $\ddagger=$＂MALE＂DFi MF；$=$＝$M$＂THEN G $*=$＂HE＂：F＂丰＝＂HIS＂
8Ø IF MF：$=$＂FEMALE＂DF MF：$=$＂F＂THEN G丰＝＂SHE＂：F＂$=$＂HER＂
90 FFiINT＂WHAT CITY IS＂G丰＂FFOM？＂：INFUT C丰
100 FFIINT＂HOW OLD IS＂G丰＂NOW？＂：INFUT A
110 FFiINT＂WHAT IS＂F＂末＂FAVOFITE HOEEY＂：INFUT H丰
120 FFIINT＂WHAT IS＂F＂₹＂NICKNAME＂：INFUT NN：
1．$\because \square F F I N T$＂FFESS ANY KEY TO STAFT THE JOKE．＂
140 GET S丰：IF S＊＝＂＂THEN140
150 HOME
160 FFINT＂FFEESS A FEY AND I WILL TALK゙ TD YOU＂
170 GET S丰：IFS丰＝＂＂THEN170
180 FFINT＂HELLO，LET ME TFY TO GUESS YOUFi NAME：＂
190 FFINT＂I＇M THINKING．．．．＂
200 GOSUE 400
210 FFINT＂YOU LOOF：LIFKE SOME TYFE OF＂N末：GOSUE4ØØ
220 FFINT＂EUT I HOFE YOU WON＇T MIND IF I CALL YOU＂
2ङ FFFINT NN末：GOSUE4ロロ
240 FFIINT＂THE TOUCH OF YOUF FINGEFS＂：FFINT
250 FFIINT＂LEADS ME TO EELIEVE YOU AFE AT LEAST＂：FFIINT
260 FFINT $A^{\prime \prime}$ YEAFS OLD＂：GOSUE40Ø
270 FFIINT＂AND YOU SMELL LIFE A FEFSSON FFOM＂：FFFINT
28® FFIINT C末：GOSUB40』
290 FFINT＂THE CENTFAAL COMFUTEF TELLS ME YOU LIF゙E：＂：FFINT
تロロ FFIINT H末：GOSUB40ロ
310 FFIINT＂NOW，IT＇S YOUF TUFN TO ASKK ME A QUESTION＂
玉2Ø INFUT＂TYFE YOUF QUESTION，THEN FFFESS FETUFN＂：Q⿻三丨⿻二丨䒑口
ごも GOSUE400
340 FFiINT＂SOFiFiY，＂NN末＂THAT＇S TOD FEFSSONAL！＂
SSD FFIINT＂YOUFi ACCESS TO THE MASTEF COMFUTER HAS＂
$\leq 60$ FFIINT＂EEEN TEFIMINATED UNTIL 1999＂：END
400 FOF：$T=1$ TO 4ØDD：NEXTT：HOME：FETUFN
continued on next page．．．．．

AF＇FLE

FFIACTICAL JOKE con＇t．．．

In．the FRACTICAL JOKE program you are introduced to some new commands．Two are called GOSUE and FETURN（not the key）． GDSUE 40Ø means，＂goto the subroutine at 400＂．A SUEFOUTINE is litee a program，within a program．RETUFN means＂return to the main program＂．A SUEROUTINE always starts with GOSUB and ends with RETUFN．This SUEFOUTINE，line 400, causes a time delay and clears the screen．In 1 ines 140 and 170 is another，new command，called GET．GET $S$ 丰 tells the computer to wait for a key to be pressed．In line 140 ，if no key is pressed，the computer waits at 1 ine 140 ．When a key is pressed，the program proceeds on to line 150.

VAFIAELES are：
T＝time delay
N末＝＝victim＇s name
MF $\ddagger=m a l e$ or female
Gi＝＝he or she
Cも＝city
$A=$ age
His＝hobby
NNま＝nickname
F＇丰＝his or her
Q丰＝question
S丰＝get variable

AFF'LE
Eonus Frogram \#10 MATH SHAFiFENEF
This program is called the MATH SHARFENEF. I've been saving this program for the whiz kids. You must be one, or you wouldn't be reading this. The MATH SHAFFENEF has been designed to quiz both the beginner, and the advanced, on basic math skills. Don't use a scratch pad and I assure you, you'll get a work out. You will receive instructions when you FUN the program.

```
10 FEM***MATH SHAFFFENEF***
20 S=0:HOME
\XiO FFINT"THIS IS A FFOGRAM TO SHAFFEN YOUR MATH"
40 FRINT
50 FFINT "FICK#: 1)EASY 2)HARD, THEN FETURN"
6 0 ~ I N F U T ~ L ~
70 FFINT"THE SYMBOLS AFE:"
80 FFINT"+ ADD - SUBTFACT"
90 FFINT"* MULTIFLY / DIVIDE":FRINT
100 FFINT"EXAMFLES:"
110 FFINT"2+3=5 8-4=4"
120 FFRINT"2*4=8 9/S=3":FFINT
130 FFINT"FICE THE NUMBEF OF THE FUNCTION"
140 FFIINT"YOU WANT TO FRACTICE:":F'RINT
150 FFiINT"1)ADD"
160 FFFINT"2)SUBTRACT"
170 FFFINT"\Xi)MULTIFLY"
180 F'FINT"4)DIVIDE"
190 INF'UT D
200 HOME:FFINT"TYFE THE NUMEER OF QUESTIONS"
210 INFUT"YOU WANT, THEN FFESS FETUFNN ":0
220 FOF T=1 TO Q
2S0 FFINT"ANSWEF THE FFOBLEM, THEN FRESS RETUFN":FRINT
240 IF L=1 THEN A=INT(FND (1)*10) +1:B=INT (FND (1)*10)+1
250 IF L=2 THEN A=INT(FND (1)*200) +1:E=INT (FND (1)*200) +1
260 IF D=2 AND A<E THEN 240
270 IF D=4 AND A<B THEN 240
280 IF D=4 AND A/E <> INT (A/E) THEN240
290 IF A=B OF B=1 THEN 240
S00 IF D=1 THEN FRINT A"+"B"=";:INFUTC
310 IF D=2 THEN FFINT A"-"E"=";:INFUTC
320 IF D=3 AND L=1 THEN FRINT A"*"B"=";:INFUT C
SB| IF D=\Xi AND L=2 THEN FFINT INT(A/5)"*"INT(E/5)"="::INFUTC
S40 IF D=4 THEN FRINT A"/"E"=";:INFUTC
```

continued on next page...

AFF－LE

```
BSQ FFFINT
360 IF D=1 AND C=A+B THEN S=S+1:FFINT "ALFIIGHT:":GOTO490
\Im70 IF D=2 AND C=A-E THEN S=S+1: FRINT"RIGHT ON!":GOTO490
30 IF D=S AND L=1. AND C=A*E THEN S=S+1:Z=1
390 IF Z=1 THEN FFFINT "COFFECT!": Z=0:GOTO490
400 IF D=\Xi AND L=2 AND C=INT (A/S)*INT(E/5) THEN S=S+1:Z=2
410 IF }Z=2 THEN F'FINT "GFEAT!": Z=0:GOTO490
420 IF D=4 AND C=A/E THEN S=S+1:FFFINT"YOWSAH!":GOTO490
4.Ø FFINT"YOU GOOFED. THE ANSWEF WAS:":
440 IF D=1 THEN F'FIINT A+E
4 5 0 ~ I F ~ D = 2 ~ T H E N ~ F F I I N T ~ A - B ~
4 6 0 ~ I F ~ D = S ~ A N D ~ L = 1 ~ T H E N ~ F ' F I N T ~ A * B
47Ø IF D=\Xi AND L=2 THEN FFFINT INT(A/5)*INT(E/5)
480 IF D=4 THEN FFIINT A/E
490 FOFF W=1TG80D:NEXT W:HOME:NEXT T
500 FFINT"YOUF SCOFE IS:"S" OUT OF "Q" FiIGHT!"
510 FFINT"FFESS ANY KEEY TO CONTINUE"
520 GET A:= IF A:= ""THENSこ0
5.G GOTO 10
The VAFIAELES are:
L=easy/hard
D=function to practice
G=# of questions
T=question loop
A=random number 1
E=random number 2
C=choice (your answer)
W=delay
S=score
A⿻三丨\mp@code{qet variable}
Z=correct multiplication flag
If you have problems getting this program to work properly， double chect：lines 240－500．These are the lines where most of the mathematicel processing takes place．In this section，if \(D=1\) ，then you are adding：if \(D=2\) ，you are subtracting；\(D=\underset{\text { G }}{ }\) ，means multiplying：and \(D=4\) signifies division．If \(L=1\) ，then the quizzes are easy．If \(L=2\) ，then the quizzes are hard．Should you have the desire to make the program more difficult，you can increase the FANDOM NUMEEFS，in lines 240－250．
```

Atari 40ロ／800

Bonus Frogram \＃1 CAFTOON FOBOT

Riddle：What＇s sweet，but square；high tech，yet down to earth；and brilliant，with the I．O．of a doughnut？

Give up？
The answer is：The Fabulous KISSING FOBOT．
You＇ll key in a program using FOR and NEXT to make a cartoon．The command FOR and NEXT are used for counting．

```
14 FFINT CHRक(125)
16 FRINT "()************()"
18 PRINT "** **"
20 PRINT "** (口) (D) **"
2 2 ~ P R I N T ~ " * * * * * * * * * * * * )
24 FRINT "** V **"
26 PRINT "*****
28 PRINT "** --- **"
30 FOR T=1 TO 50:NEXT T
32 FRINT CHR$(125)
34 PRINT "()************()"
36 FRINT "** . **"
3B PRINT "** (O) (-) **"
40 FRINT "** **"
4 2 ~ F F i I N T ~ " * * * * * * * * * * * * * ) V ~ * * * * )
4 4 ~ F R I N T ~ " * * * * * * * * * * * * * * * )
46 PRINT "** 0 **"
48 FOR T = 1 TO 50: NEXT T
50 PRINT CHR急(125)
52 PRINT "()*************()"
```



```
5 6 ~ F R I N T ~ " * * ~ ( O ) ~ ( O ) ~ * * " '
```



```
60 FFIINT "** v **"
6 2 ~ F F I N T ~ " * * ~ * * " ~
6 4 ~ F R I N T ~ " * * ~ D ~ * * " ~
66 FOR T = 1 TO 50: NEXT T
68 GOTO 14
```

This program works like a real cartoon．The robot is printed on the screen，and erased，three times．Each time it is printed；there are small changes made，which give the illusion of movement．Line 68 GOTO 14 starts the entire process over again．The FOR／NEXT commands are used as time delays between pictures．You can change the speed of the cartoon by changing the＂50＂，in the FOF／NEXT lines，to a different number．Decreasing the number will make the cartoon faster．

ATAFI
Bonus Frogram \＃2 FAMILY DECISION MAKER
How would you like to use your home computer for solving problems like，＂Who will use the computer first，Jimmy or Bobby？＂．．．or how about，＂Should we use the $t . v$ ．to watch a movie，or play with the computer？＂．The FAMILY DECISION MAKER can help you solve these problems，and more．It will make the decision for you，by picking a random choice．All you have to do is to type in the options．

```
10 DIM O1末(50),02も(50):FFINT CHF末(125)
20 FRINT "FAMILY DECISION MAKER"
30 FOF T = 1 TO 1500:NEXT T
40 FRINT CHF:%(125)
50.FRINT "TYFE IN THE OFTIONS"
G| FFINT "AND THE COMFUTEF WILL DECIDE"
70 FFINT "WHAT IS OFTION #1"::INFUT O1F
80 FRINT "WHAT IS OFTION #2":INFUT O2%
90 FRINT "I'M THINKING IT OVEF:......"
100 FOR T = 1 TO S000:NEXT T
110 C=INT (FND (1)*2)+1
120 FRINT CHRF%(125)
130 FFINT "MY CHOICE IS:"
140 IF C = 1 THEN FRINT 01车
150 IF C = 2 THEN FFINT O2%
```

The computer makes its choice in line 110 ．Lines 90 and 100 are where the computer is，＂thinking it over＂．You probably noticed that the computer isn＇t really＂thinking it over＂． It＇s actually counting up to 3000 ，then executing line 110 ． The choice is printed on the screen in lines 130－150．DIM O1F（50），02丰（50）sets a maximum of fifty letters，in each choice．

The VARIABLES are：
T＝time delay
C＝choice
OL⿻三丨⿻二丨冂刂＝option \＃1
02丰＝option \＃2

## ATAFI

Bonus Frogram \＃S FEACTION TIMEF

Here is a program to test your reaction time．When the computer says＂GQ！＂，you must press the BFEAF key as quickiy as you．can．Compare your score with the chart in the program．Good luck：

10 DIM A丰（1）：FFINT CHF丰（125）
20 FFIINT＂TEST YOUFi FEACTION TIME＂
TO FFINT＂AGAINST THE COMFUTEF．＂
40 FFINT＂WHEN THE COMFUTEF＇SAYS＇GO！＇＂
5® FFINT＂FRESS THE EFEAKK KEY＂
GO FFINT＂YOUF SCOFE IS THE HIGHEST NUMEEF YOU SEE＂
70 FFINT：FFINT＂ $01-10=L I G H T N I N " 10-20=\square U I C k \in!"$
80 FFIINT＂2Ø－$\Xi \square=A V E F A G E \quad \Xi \emptyset-5 \emptyset=N A F F^{\prime} I N G "$
90 FRINT：FRINT：FFINT＂FFESS FETUFN＂
100 FFIINT，＂WHEN YOU AFE FEADY＂
110 INFUT A：
120 FFINT CHFi $⿻$（125）：FFINT＂ON YOUF MAFK゙＂
$1 \Xi O$ FOF $T=1$ TO 1OOQ：NEXT T：FRINT＂GET SET！＂
140 FOFi $T=1$ TO INT（FND（1）＊Sロロロ）：NEXT T
150 FFINT CHF＊丰（125）：FFINT＂GO！＂
160 FOF $T=1$ TO SO：FFIINT T：NEXT T
170 FFIINT＂SOMEONE WAKE THIS FEFSON UF！＂

The VAFIAELE，of the FOF／NEXT statement in line 140 ，equals a FANDOM INTEGEF between one and five thousand．This causes the time delay to be different each time the program is RUN． When you press the EFEAK key the computer will say，＂STOFFED AT $160 "$ ．This is normal for the program．Your score is the highest number you see．Type FUUN and press FiETUFN to play again．

ATAFI
Eonus Frogram \#4 M.Fig. FECOFDEFi
If you're like me, you never take the trouble to figure out your car's miles per gallon (M.F.G.). Even having a calculator handy has never helped, though there are only three basic numbers to calculate. This is one more instance in which wanting to use my computer motivates me to do the fairly simple task I've managed to ignore. My mechanic tells me that $I$ should check my M.F.G. after every five fill-ups. That way, if my MnF.G. starts dropping, I can take my car in for a checkup. : b before it's too late.

10 FFiNT CHFiま(125)
20 FFINT "MFG CALCULATOF"
30 FOR $T=1$ TO 1500: NEXT T
40 FRINT CHF: (125)
50 FRINT "THIS IS A FFOGRAM TO FIGURE OUT"
6Ø FFINT "THE MILES FEF GALLON YOUR CAF GETS"
70 FRINT "HOW MANY MILES HAVE YOU DFIVEN"
80 FRINT "DUFING THE FAST FIVE FILL-UFS"
90 INFUT M
100 FRINT "HOW MANY GALLONS OF GAS DID YOU USE"
110 FRINT "IN THE FAST FIVE FILL-UFS"
120 INFUT G
$1 \Xi 0 \mathrm{MFG}=\mathrm{M} / \mathrm{G}$
140 FRINT "YOU HAVE BEEN GETTING ":MFG
150 FRINT "MILES FER GALLON"
Notice that we used $G$ as the VAFIABLE for gas, M as the VAFIABLE for miles, and MFG as the VAFIABLE for miles per gallon. In line $1 \mathbb{Z} 0, \mathrm{MFG}=\mathrm{M} / \mathrm{G}$ means miles per gallon equals miles divided by gallons.

## ATARI

## Bonus Frogram \#5 COUFON CALCULATOF:

Computers are pretty good at solving problems and presenting the results in a manner which is easy to read. This program can be used to display the amount of money you will save with your shopping coupons.

10 PRINT CHR象(125)
20 FRINT "COUFON CALCULATOR"
30. PRINT:PRINT "TO FIND OUT HOW MUCH YOU'LL SAVE"

40 PRINT "WITH YOUR SHDFFING COUFONS"
50 PRINT "ANSWER THE FOLLOWING QUESTIONS"
60 PRINT "THEN FRESS THE RETURN KEY"
70 PRINT:PRINT "HOW MANY COUFONS DO YOU HAVE"
80 INFUT C
90 PRINT:FRINT "ENTEF THE AMOUNT OF A COUPON"
$10 \square$ FRINT "DON'T USE A DOLLAR SIGN"
110 FRINT "DO USE A DECIMAL FOINT":FRINT
120 FOF $E=1$ TO C: FRINT "ENTER VALUE OF COUPON \#";E
$1 \Xi 0$ INPUT $A$
$140 \mathrm{~T}=\mathrm{T}+\mathrm{A}$
150 NEXT E
160 FRINT:FRINT "末":T;" WILL BE SAVED"
The VAFIABLES in this program are:
$C$ =number of coupons
$E=$ coupon\#
A=value of coupons
T=total value of coupons
Line 140 adds up the total, each time a value is entered into the computer. Line 160 prints the total value to be saved.

ATARI
Bonus Frogram \#6 SFORTS FORCASTEF:
The SFORTS FORECASTER can be a handy program if you enjoy sports. This program will take a team's current record and project, based on winning percentage, what the team's record will be at the end of the season.

10 PRINT CHFक (125)
20 FRINT "SFORTS FORECASTER"
30 FOR $Z=1$ TO 1500:NEXT Z:FRINT
40 PRINT "THIS FROGRAM WILL FORECAST A TEAM'S"
50 FRINT "FINAL WIN AND LOSS RECORD"
60 PRINT "BASED ON ITS CURRENT RECORD"
70 FRINT:PRINT "ANSWER EACH QUESTION"
80 FRINT "THEN FFEESS FETURN"
90 PRINT:PRINT "HOW MANY. GAMES DOES THE TEAM PLAY"
100 INFUT T
110 FFINT:FRINT"HOW MANY WINS DO THEY HAVE NOW"
120 INFUT $W$
130 FRINT "HOW MANY LOSSES DO THEY HAVE NOW"
140 INFUT L
$150 \mathrm{~F}=\mathrm{W} /(W+L): Y=T * F: D=T-Y$
160 FRINT:FRINT "END OF THE SEASON PROJECTION:"
170 PRINT:FRINT "WINS="; INT (Y);" LOSSES=";INT(D)+1
The VARIABLES are:
Z=time delay variable
T=total games in season
$W=$ games won
L=games lost
F=percentage of games won
$Y=$ end of year games projected won
$D=e n d$ of year games projected lost
The forecast is completed in line 150 when the winning percentage ( $F$ ) is established by dividing the number of completed games $(W+L)$ into the total games won so far ( $W$ ). The total wins for the year is estimated by multiplying the amount of games in the season (T) by the winning percentage (F). The year end losses are determined by subtracting the end of year projected games won (Y) from the total games in the season. (T).

Eonus Firogram \＃7 ELECTION RETUFNS

Stage a mock primary，in which there are four candidates． Twenty five precincts report，one at a time．Fiunning totals are printed as each reports．When all the returns are in， the computer displays the winner．This is a great way to get a feel for computerized election returns．

10 DIM N1丰（15），N2丰（15），N3丰（15），N4丰（15）
20 PRINT CHF゙丰（125）
3Ø FRINT＂ELECTION RETUFNS＂
40 FDR $T=1$ TD 150ロ：NEXT T
50 FFiINT＂INFUT THE NAME OF CANDIDATE \＃1＂：：INFUT N1＊
60 FRIINT＂INFUT THE NAME OF CANDIDATE \＃2＂：：INFUT N2丰
$7 \emptyset$ FRINT＂INFUT THE NAME OF CANDIDATE \＃ड＂；：INPUT N3末
80 PRINT＂INFUT THE NAME OF CANDIDATE \＃4＂；：INFUT N4＊
90 PRINT CHFi＊（125）
10Ø PRINT＂THE FOLLS JUST CLOSED＂
110 PFINT＂AND THE RESULTS AFE COMING IN＂
120 FOR $P=1$ TO 25
13 $\mathrm{N} 1=\mathrm{I} N T(\operatorname{FND}(1) * 999): N 2=I N T($ RND（1）＊999）
140 N3 $3=I N T(R N D(1) * 999): N 4=I N T(F N D(1) * 999)$
150 FOR T＝1 TD 2000：NEXT T
160 FRINT CHR丰（125）
170 FFIINT＂FFECINCT\＃＂；F；＂FESULTS：＂
180 FRINT N1：＂－＂：N1丰：T1＝N1＋T1

2ロロ FFRINT N．S：＂－＂；NS丰：TS＝NS＋T3
210 FFINT N4；＂－＂；N4井：T4＝N4＋T4
220 FOR T＝1 TO 150』：NEXT T
230 PRINT
240 F＇RINT＂CUFIFENT TOTALS：＂
250 FFiINT T1：＂－＂：N1夆
26』 FRINT T2；＂－＂：N2＊
270 FRINT T3：＂－＂：NS丰
28』 FFiINT T4：＂－＂：N4丰
290 FDF $T=1$ Tロ 2ロロロ：NEXT T
3ロØ NEXT F
310 FFiINT＂ALL RETUFNS IN，AND＂
320 IF T1＞T2 AND T1＞TS AND T1＞T4 THEN PRINT N1＊
$33 \oslash$ IF T2＞T1 AND T2＞T3 AND T2＞T4 THEN FRINT N2丰
$34 \boxtimes$ IF $T 3>T 1$ AND TB＞T2 AND TS＞T4 THEN FRINT NS急
350 IF T4＞T1 AND T4＞T2 AND T4＞TS THEN FRIINT N4＊
さb® FFIINT＂IS THE WINNEF！！！！＂
continued on next page．．．

ATARI
Eonus Firogram \#7 continued...
The VAFIABLES are:
N1 $==$ candidate \#1 name
N2丰=candidate \#2 name
NS $=$ =candidate \#S name N4F=candidate \#4 name
N1=can. \#1 local votes
N2=can. \#2 local votes
NS=can. \#S local votes
N4=can. \#4 local votes
T1=can. \#1 total votes
T2=can. \#2 total votes
T3=can. \#3 total votes
T4=can. \#4 total votes
T=time delay
F'=precinct loop

The DIM statements, in line 10 , set the maximum number of letters in each candidate's name to fifteen. Changing line 120 will allow you to have more precincts. The $999^{\prime} \mathrm{s}$, in lines 130 and 140 , can be modified to produce a higher number of votes in each precinct. If the program runs too slow for you, just change the time delays in lines 150, 220, and 290. Try 1000, or maybe even 500, if you are a quick reader.

## ATARI

## Eonus Frogram \＃8 NUMEEFi GAMES FOF TWO

Computers are great for playing games．They can be programmed to mat：e games，both unpredictable and exciting． Here is a super game for two people．The computer＂pulls a number out of its hat＂，and the players tate turns trying to guess the number．The player with the most correct quesses， after seven rounds，is the champ．Switch sides after seven rounds．You will be surprised at the strategies involved．
10 DIM Fi1丰（15），F2丰（15）：FFINT CHFis（125）
20 FFINT＂THIS IS A NUMEEF GAME FOF TWO FEOFLE＂
$\therefore$ FFINT＂THE COMFUTEF FICトS A NUMEEF EETWEEN 1 AND SOD：＂
40 FFIINT＂THE FLAYEFS TAKE TUFNS GUESSING THE NUMEEF＂
SO FRINT＂UNTIL SOMEDNE GUESSES THE NUMEEF＂
60 FFINT＂THE FLLAYEF GUESSING THE MOST NUMEEFSS＂
70 FFIINT＂AFTEF 7 FIOUNDS，IS THE WINNEF＂
80 FFINT＂WHAT IS FLAYEF \＃1＇S NAME＂：INFUT Fi丰
90 FFINT＂WHAT IS FLLAYEF \＃2＇S NAME＂：INFUT F2ま
$100 \mathrm{~F}=\mathrm{FR}+1: N=\operatorname{INT}$（FND（1）＊50Ø）+1
110 IF $F>1$ THEN FFIINT＂THE SCOFE IS＂：Fi＊：＂m＂：Fi：＂
＂：F2丰：＂＝＂；${ }^{\circ}$
120 FOF $T=1 \mathrm{TO} 2500:$ NEXT $T$
130 IF $F>7$ THEN 260
140 FOF $T=1$ TO $1000:$ NEXT $T$
150 FRINT CHFi丰（125）：FFINT＂ROUND＂：Fig＂，＂：Fito＂S TUFN＂
160 FFIINT＂WHAT IS YOUF GUESS＂：INFUT G1
170 IF G1 \＆N THEN FRINT．＂TOO LOW＂FFi⿻三丨日GOTO 2ロロ
180 IF E1 $>\mathrm{N}$ THEN FFINT＂TOO HIGH＂：GO TO $2 \oslash 0$
190 FFINT＂YOU GOT IT＂：F1丰：F1＝F1＋1：GOTO 100
200 FOF $T=1$ TO 100ロ：NEXT T
210 FFINT CHFis（125）：FFIINT＂ROUND＂；Fi＂，＂FFま：＂：S TUFN＂
220 FFINT：FFINT＂WHAT IS YOUF GUESS＂：INFUT G工
$2 \mathrm{Z} \square$ IF G2 \＆N THEN FFINT＂TOO LOW＂：GOTO 140
240 IF G2 $>N$ THEN FFINT＂TOO HIGH＂：GOTO 140

260 FFiINT CHFi三（125）：FOF $T=1$ TO 1000：NEXT T
 ＂：F2：END

The VAFIABLES are：
Fit：＝player \＃1
F2：$=$ player $\# 2$
Fi＝player \＃1 score
F2＝player \＃2 score
G1＝player \＃1 guess
G2＝player \＃2 guess
Fi＝round $\#$
T＝time delay variable
$N=s e c r e t$ number
The secret number（N）is picted in line 100．To alter the limits of the secret number，you can change the 500 to a larger or smaller number．Try 10000 ，for instance．In several places you may notice symbols like this：or or this：$\because$＂The symbol $?$ means＂greater than＂and means＂less．than＂．Can you make this game work with four players？

ATAFI

Bonus Firogram \＃9 FFiACTICAL JOKEFi

Are you ready for some laughs？If 50 ，Bonus Frogram \＃9
is the one for you．It＇s called the F＇FiACTICAL JOKE FFOGRAM．
Here＇s how it works：

You type the program into your computer while the victim isn＇t around．RUN the program．The computer will ask you questions about the victim．You answer all the questions until the computer says，＂FRESS FETURN TO START THE JOKE＂． Fress a key and the joke is ready for the victim．When the victim comes back，the computer will seem to know all about
him／her．Just say that you＇re hooked up to the MASTER
COMPUTER，and it knows EVERYTHING！！！

1）， $\mathrm{Q}=(25), G \$(10), \mathrm{P}=(10)$
2ロ FRINT CHF゙丰（125）
3Ø FRINT＂FFAACTICAL JOKE FROGFAM＂

50 PFINT＂WHAT IS THE VICTIM＇S NAME＂：INFUT N\＄
60 FRINT＂IS THE VICTIM MALE OFi FEMALE＂；：INFUT MF $\$$

80 IF MF $=$＝＂FEMALE＂OF MF $\ddagger=$＂F＂THEN G $\ddagger=$＂SHE＂：P＊＝＂HER＂
90 FFINT＂WHAT CITY IS＂；G步：＂FFOM？＂：INPUT C＊
1®0 FFIINT＂HOW OLD IS＂：G丰：NOW？＂：INFUT A
110 FRINT＂WHAT IS＂：F₹；＂FAVORITE HOBEY＂：INPUT H
120 FRINT＂WHAT IS＂：F＂：＂NICKNAME＂：INFUT NN
130 FRINT＂PRESS FETUFN TO START THE JOKE．＂
140 INFUT 5丰
150 F•RINT CHFi＊（125）
160 FRINT＂FFESS FETUFN AND I WILL TALKK TD YOU＂
170 INPUT S丰
180 FFINT＂HELLO，LET ME TFY TO GUESS YOUR NAME．＂
190 FFiINT＂I＇M THINKING．．．＂
200 GロSUB 400
210 FRINT＂YOU LOOK゙ LIKEE SOME TYFE OF＂：N＊：GOSUE4DØ
220 PFINT＂BUT I HOFE YOU WON＇T MIND IF I CALL YOU＂
2ふロ FRINT NN丰：GOSUB4ØØ
240 FRINT＂THE TOUCH OF YOUF FINGEFS＂：FRINT
250 FFiINT＂LEADS ME TO EELIEVE YOU AFE AT LEAST＂：FFIINT
260 FRINT A：＂YEAFSS DLD＂：GOSUB40ロ
270 FFiINT＂AND YOU SMELL LIKE A FEFSSON FFOM＂：FFiINT
280 FFIINT C末三：GOSUB400
290 FRINT＂THE CENTFAL COMFUTEF TELLS ME YOU LIKE：＂：FRINT
30Ø FRINT HF：GOSUB400
310 FFIINT＂NOW，IT＇S YOUR TUFN TO ASK ME A QUESTION＂
320 PRINT＂TYPE YOUR QUESTION，THEN PRESS RETURN＂：：INFUT Q $\$$
330 GOSUB400
340 FRINT＂SDRFiY，＂！NN年：＂THAT＇S TOD FERSONAL！＂
350 PRINT＂YOUR ACCESS TD THE MASTER COMFUTER HAS＂
360 FRINT＂EEEN TERMINATED UNTIL 1999＂：END
$40 \emptyset F D R T=1$ TO 4ロロロ：NEXTT：FRINT CHR丰（125）：RETURN
continued on next page．．．．

## ATAFI

In the FFACTICAL JOKE program you are introduced to some new commands: Two are called GOSUE and RETURN (not the key). GOSUB 400 means, "goto the subroutine at. 400 ". A SUBROUTINE is like a program, within a program. FETUFN means "return to the main program". A SUBFOUTINE always starts with GOSUE and ends with RETURN. This SUBROUTINE, line 400 , causes a time delay and clears the screen.

VAFIAELES are:
T=time delay
N末=victim's name
MF $=$ =male or female
Gi:he or she
C $=$ =city
$A=a g e$
$\mathrm{H}=$ =hobby
NN: = ni ckname
FF=his or her


ATAFI

## Eonus Frogram \＃10 MATH SHARFENER

This program is called the MATH SHARFENEF．I＇ve been saving this program for the whiz kids．You must be one，or you wouldn＇t be reading this．The MATH SHARPENER has been designed to quiz both the beginner，and the advanced，on basic math skills．Don＇t use a scratch pad and I assure you，you＇ll get a work out．You will receive instructions when you FUN the program．

10 DIM Aま（1）
20 FRINT CHFま．（125）
Sロ FFINT＂THIS IS A FFOGFAM TO SHAFFEN YOUF MATH＂
40 FFIINT
50 FFINT＂CHOOSE：1）EASY 2）HAFD，THEN FRESS FETUFN＂
60 INFUT L
70 FFINT＂THE SYMBOLS AFE：＂
80 FFINT＂＋ADD－SUETRACT＂
90 FFiNT＂＊MULTIFLY／DIVIDE＂：FFINT
100 FRINT＂EXAMFLES：＂
110 FFINT $" 2+5=5 \quad 8-4=4 "$
120 FRINT $4 * 2=8 \quad 9 / \Xi=5 "$
150 FFINT＂FICK THE NUMBER OF THE FUNCTION＂
140 FFINT＂YOU WANT TO FRACTICE：＂：FRINT
150 FFINT＂1）ADD＂
160 FRINT＂2）SUBTRACT＂
170 FFINT＂ङ）MULTIFLY＂
180 FRINT＂4）DIVIDE＂
190 INFUT D
200 FFINT CHFi（125）：FRINT＂TYFE THE NUMEEF OF QUESTIONS＂
210 FRINT＂YOU WANT；THEN FRESS RETURN＂：：INFUT $Q$
220 FOF T＝1 TO 0
$2 \Xi 0$ FFINT＂ANSWEF THE FFIOELEM，THEN FRESS FETURN＂：FRINT
240 IF $L=1$ THEN $A=\operatorname{INT}(\operatorname{FND}(1) * 10)+1: E=\operatorname{INT}(\operatorname{FND}(1) * 10)+1$
250 IF $L=2$ THEN $A=\operatorname{INT}(\operatorname{FND}(1) * 200)+1: B=I N T \quad(\operatorname{FND}(1) * 200)+1$
260 IF $D=2$ AND $A<B$ THEN 240
270 IF $D=4$ AND $A<E$ THEN 240
280 IF $D=4$ AND $A / B<>\operatorname{INT}(A / B)$ THEN240
290 IF $A=E$ OF $E=1$ THEN 240
S00 IF $\mathrm{D}=1$ THEN FFINT $\mathrm{A}: "+" ; \mathrm{B} ; "=" ;:$ INFUTC
S10 IF D＝2 THEN FFINT A；＂－＂；B；＂＝＂；：INFUTC
S20 IF D＝S AND L＝1 THEN PFINT A；＂＊＂：E；＂＝＂：：INFUT C
$3 \Xi$ IF $D=3$ AND $L=2$ THEN FFiINT
INT（A／5）：＂＊＂；INT（E／5）：＂＝＂；：INFUTC
З40 IF D＝4 THEN FFINT A；＂／＂；B；＂＝＂；：INFUTC
continued on next page．．．

ATARI
S50 FRINT
360 IF $D=1$ AND $C=A+B$ THEN $S=S+1: F R I N T$ "ALFIGHT!":GOTO490
370 IF D=2 AND C=A-B THEN S=S+1: FFINT"RIGHT ON!":GOTO490
380 IF $D=S$ AND $L=1$ AND $C=A * E$ THEN $S=S+1: Z=1$
390 IF $\mathrm{Z}=1$ THEN FRINT "CORRECT!": $\mathrm{Z}=0:$ GOTO490
400 IF $D=3$ AND $L=2$ AND $C=I N T(A / 5) * I N T(B / 5)$ THEN $S=S+1: Z=2$
410 IF $\mathrm{Z}=2$ THEN FRINT "GREAT!": $\mathrm{Z}=0:$ GOTOSøD
420 IF $\mathrm{D}=4$ AND $\mathrm{C}=\mathrm{A} / \mathrm{E}$ THEN $\mathrm{S}=\mathrm{S}+1:$ FRINT"YOWSAH!":GOTO490
4ミ0 FRINT"YOU GOOFED. THE ANSWER WAS: ";
440 IF $D=1$ THEN FFiINT $A+B$
450 IF $D=2$ THEN FRIINT $A-B$
460 IF $D=3$ AND $L=1$ THEN PFINT $A * E$
470 IF $D=3$ AND $L=2$ THEN FRINT INT(A/S)*INT (E/S)
480 IF $\mathrm{D}=4$ THEN FRINT A/B
490 FOF $W=1$ TO800: NEXT W:FRINT CHR $\$$ (125): NEXT T
500 FRINT"YOUR SCORE IS: ":S;" OUT OF ":Q;" FIGHT!"
S10 FRINT"FRESS RETURN TO CONTINUE"
520 INFUT A
5s0 S=0:GOTO 20
The VAFIABLES are:
L=easy/hard
D=function to practice
Q=\# of questions
T=question loop
$A=r$ andom number 1
$\mathrm{B}=$ random number 2
$\mathrm{C}=$ choice (your answer)
W=delay
$\mathrm{S}=$ score
A $=$ =continue variable
$Z=c o r r e c t ~ m u l t i p l i c a t i o n ~ f l a g ~$
If you have problems getting this program to work properly, double check lines 240-500. These are the lines where most of the mathematical processing takes place. In this section, if $D=1$, then you are adding; if $D=2$, you are subtracting; $D=3$, means multiplying; and $D=4$ signifies division. If $L=1$, then the quizzes are easy. If $L=2$, then the quizzes are hard. Should you have the desire to make the program more difficult, you can increase the fANDOM NUMEEFS, in lines 240-250.

Fiddle: What's seet, but square; high tech, yet down to earth: and brilliant, with the I.Q. of a doughnut?

Give up?
The answer is: The fabulous k゙ISSING FOEDT
You'll key in a program uṣing FOF and NEXT to make a cartoon. The commands FOF and NEXT are used for counting.


This program works like a real cartoon. The robot is printed on the screen, and erased, three times. Each time it is printed, there are small changes made, which give the illusion of movement. Line 68 GOTO 14 starts the entire process over again. The FOFi/NEXT commands are used as time delays between pictures. You can change the speed of the cartoon by changing the 75, in the FOF/NEXT lines, to a different number. Decreasing the number will make the cartoon faster.

## COMIMODORE

## Bonlis Frogram \＃2 FAMILY DECISION MAKEF：

How would you like to use your home computer for solving problems like，＂Who will use the computer first，Jimmy or Bobby？＂．．．or how about，＂Should we use the t．v．to watch a movie，or play with the computer？＂．The FAMILY DECISION MAKER can help you solve these problems，and more．It will make the decision for you，by picking a random choice．All you have to do is to type in the options．

10 FFiNT CHFic（147）
20 FRINT＂FAMILY DECISION MAKEF＂
SO FOF T $=1$ TO 1500：NEXT T
40 FRINT CHR：（147）
50 FRINT＂TYFE IN THE OFTIONS＂
60 FFINT＂AND THE COMFUTER WILL DECIDE＂
70 INFUT＂WHAT IS OFTION \＃1＂：01丰
80 INFUT＂WHAT IS OFTION \＃2＂：02も
90 FFINT＂I＇M THINKING IT OVEF．．．．．．．．＂
100 FOR $T=1$ TO $3000: N E X T T$
$110 \mathrm{C}=\mathrm{INT}(\mathrm{FND}(1) * 2)+1$
120 FRINT CHR $=(147)$
$13 \square$ FRINT＂MY CHOICE IS：＂
140 IF $\mathrm{C}=1$ THEN FRINT O1 $⿻=1$
150 IF $\mathrm{C}=2$ THEN FRINT 02丰
In this program the computer makes its choice in line 110. Lines 90 and 100 are where the computer is，＂thinking it over＂．You probably noticed that the computer isn＇t really ＂thinking it over＂．It＇s actually counting up to 3000 ，then executing line 110．The choice is printed on the screen in lines $130-150$.

The VAFIABLES are：
T＝time delay
C＝choice
01：$=$ option \＃1
02．s＝option \＃2

COMMODORE

Eonus Frogram \＃．FiEACTION TIMEFi

Here is a program to test your reaction time．When the computer says＂GO！＂，you must press the RUN／STOF key as quickly as you can．Compare your score with the chart in the program．Good luck！

```
10 FFFINT CHF夆(147)
2』 FFiINT "TEST YOUFi FEACTION TIME"
30 FRIINT "AGAINST THE COMPUTEFF."
40 FFFINT "WHEN THE COMFUTER SAYS 'GD!""
50 FRIINT "FRESS THE FUN/STOF KEY"
60 FRINT "YOUF SCOFE IS THE HIGHEST NUMEER YOU SEE"
70 FRINT:FRINT "\emptyset1-10=LIGHTNIN" 10-20=OUICK!"
8| FFRINT "2Ø- 
90 PRINT:F'RINT:FRINT "FFESS FEETURN"
1Ø\emptyset FFIINT "WHEN YOU AFEE FEEADY"
110 INFUT A琫
120 FFIINT CHFi丰(147):FRIINT "ON YOUFi MAFKK"
130 FOR T = 1 TO 1ØØØ:NEXT T:FFINT "GET SET!"
140 FDF T = 1 TO INT (FND (1)*5000):NEXT T
150 F'FiINT CHF゙丰(147):FFINT "GO!"
160 FOFi T = 1 TO 50:FRINT T:NEXT T
170 FRINT "SOMEONE WAKE THIS FEFSSON UF"!"
```

The VAFiIABLE，of the FOFi／NEXT statement in line 140 ，equals a FANDOM INTEGEF between one and $f i v e$ thousand．This causes the time delay to be different each time the program is RUN． When you press the FUN／STOF key the computer will say， ＂Ereak：in 16Ø＂．This is normal for the program．Your score is the highest number you see．Type RUN and press FETURN to play again．

COIMIMODOFE
Eonus Frogram \#4 M.Fig. FECORDEFi
If you're like me, you never take the trouble to figure out your car's miles per gallon (M.F.G.). Even having a calculator handy has never helped, though there are only three basic numbers to calculate. This is one more instance in which wanting to use my computer motivates me to do the fairly simple task: I ve managed to ignore. My mechanic tells me that $I$ should check my MaF.G. after every five fill-ups. That way, if my M.F.G. starts dropping, I can take my car in for a checkup.n.before it's too late.

```
10 FFINT CHF*(147)
20 FFIINT "MFG CALCULATOR"
30 FOF T = 1 TO 1500:NEXT T
40 FRINT CHF:ま(147)
50 FRINT "THIS IS A FFOGRAM TO FIGUFE OUT"
60 FRINT "THE MILES FEF GALLON YOUR CAF GETS"
70 FFIINT "HOW MANY MILES HAVE YOU DRIVEN"
80 FRINT "DUFING THE FAST FIVE FILL--UFS"
90 INFUT M
100 FFINT "HOW MANY GALLONS OF GAS DID YOU USE"
110 FRINT "IN THE FAST FIVE FILL-UPS"
120 INFUT G
1S0 MPG=M/G
140 FFINT "YOU HAVE BEEN GETTING "MFG
150 FRINT "MILES FER GALLON"
```

Notice that we used $G$ as the VARIABLE for gas, M as the VAFIABLE for miles, and MFG as the VAFIABLE for miles per gallon. In line $1 \Xi \square, \mathrm{MFG}=\mathrm{M} / G$ means miles per gallon equals miles divided by gallons.

## COMMODORE

Bonus Frogram \#5 COUFON CALCULATOF
Computers are pretty good at solving problems and presenting the results in a manner which is easy to read. This program can be used to display the amount of money you will save with your shopping coupons.

10 FFiNT CHF: (147)
20 FFINT "COUFON CALCULATOF"
S0 FRINT:FRINT "TO FIND OUT HOW MUCH YOU'LL SAVE"
40 FRINT "WITH YOUR SHOFFING COUFONS"
50 FRINT "ANSWER THE FOLLOWING QUESTIONS"
60 FFind "THEN FRESS THE FETURN KEY"
70 FRINT: FRINT "HOW MANY COUFONS DO YOU HAVE"
80 INFUT C
90 FFINT:FFINT "ENTEF THE AMOUNT OF A COUFON"
100 FRINT "DON'T USE A DOLLAF SIGN"
$11 \oslash$ FFINT "DC USE A DECIMAL FOINT":FRINT
120 FOF E $=1$ TO C: FRINT "ENTER VALUE OF COUFON \#"E
130 INFUT A
$140 \mathrm{~T}=\mathrm{T}+\mathrm{A}$
150 NEXT E
160 FRINT:FFINT "丰"T" WILL BE SAVED"
The VAFIAELES in this program are:
C=number of coupons
E=coupon\#
A=value of coupons
T=total value of coupons
Line 140 adds up the total, each time a value is entered into the computer. Line 160 prints the total value to be saved.

## COMMODOFE

## Bonls Firogram \＃b SFOFTS FOFECASTEF

The SFOFTS FOFECASTEF c：an be a handy program if you enjoy sports．This program will take a team＇s current record and project，based on winning percentage，what the team＇s record will be at the end of the season．

10 FFIINT CHFi⿻三丨（147）
20 FFINT＂SFOFTS FOFECASTEF＂
$\because$ FOF $Z=1$ TO 15UQ：NEXT Z：FRINT
40 FFINT＂THIS FFROGFAM WILL FOFECAST A TEAM＇S＂
50 FFINT＂FINAL WIN AND LOSS FECORD＂
60 FFIINT＂EASED ON ITS CUFFENT FIECOFD．＂
70 FFINT：FFINT＂ANSWEF EACH OUESTION＂
BO FFINT＂THEN FFEESS FETUFN＂
90 FFINT：FFINT，＂HOW MANY GAMES DOES THE TEAM FLAY＂
100 INFUT T
110 FFIINT：FFFINT！HOW MANY WINS DO THEY HAVE NOW＂
120 INFUT W
1．$\because \quad F F I N T$＂HOW MANY LOSSES DO THEY HAVE NOW＂
140 INFUT L
$150 \mathrm{~F}=\mathrm{W} /(\mathrm{W}+\mathrm{L}): Y=\mathrm{T} * \mathrm{~F}: \mathrm{D}=\mathrm{T}-\mathrm{Y}$
16Ø FFINT：FFINT＂END OF THE SEASON FFOJECTION：＂
170 FFIINT：FFIINT＂WINS＝＂INT（Y）＂LOSSES＝＂INT（D）＋1
The VAFIABLES are：
$Z=t i m e ~ d e l a y ~ v a r i a b l e$
T＝total games in season
W＝games won
Legames lost
F＝percentage of games won
$Y=e n d$ of year games projected won
$\mathrm{D}=$ end of year gemes projected lost

The forecast is completed in line 150 when the winning percentage（F）is established by dividing the number of completed games（ $W+L$ ）into the total games won so far（W）． The total wins for the year is estimated by multiplying the amount of games in the season（T）by the winning percentage （F＇）：The year end losses are determined by subtracting the end of year projected games won（Y）from the total games in the season（T）．

## COMMODOFE

## Eonus Frogram \＃7 SHOWEF MONITOF

Getting into the shower，day after day，and finding cold water can be a drag．I＇m sure that large families know what I＇m talking about．Bonus Frogram \＃7 has been designed to whip morning bathroom confusion．It＇s called the SHOWEFi MONITOR．You type in the names and the computer pict：s the shower order．

10 FFINT CHF゙丰（147）
20 FFINT＂SHOWEF MONITOF＂
$\Xi \square F O F T=1$ TO $2 \triangle O Q: N E X T$ T：FFINT CHF丰（147）
40 FFIINT＂THIS FFOGFAM IS DESIGNED TO HELF＂
50 FFINT＂FAMILIES DECIDE，IN A FAIF WAY＂
60 FFIINT＂THE OFDEF IN WHICH THE SHOWEF IS USED＂
70 FFINT＂IN THE MOFNING＂＂
80 FFINT：FFINT＂EACH FEFSON＇S NAME IS TYFED INTO THE＂
90 FFINT＂COMFUTEF：THEN THE COMFUTEF FANDOMLY＂
$10 \square$ FFIINT＂CHODSES THE OFDEF（AS IF OUT OF A HAT）．＂
110 FFIINT＂TYFE EACH ANSWER，THEN FFESS FETUFN．＂
120 FFINT：FFINT＂HOW MANY FEOFLE IN YOUF FAMILY＂
$1 \Xi 0$ INFUT $F$
140 FFIINT：FFINT＂TYFE IN THE NAMES，ONE AT A TIME．＂
150 FFINT＂THEN FFESS FETUFN．＂
160 FOF $H=1 \mathrm{TOF}$
170 INFUT NF（H）
180 NEXT H
190 FFIINT CHFi丰（147）：FFINT＂THIS IS THE SHOWEF：OFDEF TODAY：＂
2OQ FRINT：FOR $F=1$ TQ F
$210 X=I N T$（FND（1）＊F＇）+1
220 IF N＊$(X)=" " T H E N 210$
ごロ FFiINT Nま（X）
240 N丰（X）＝＂＂
250 NEXT Fi
260 GOTO 260

The VAFIIAELES are：
F＝number of people in family
$H=a r r a y$ parking lot\＃
$X=r$ andom number
No $(X)=n a m e$ of person $X$ in array
Fi＝counting variable

You are probably wondering what an AFifiAY is．An AFifiAY is a computer parking lot．In an AFifAY you don＇t park cars：
Fiather，you park：words and numbers．In this program we parked the name of each person in an AFFFAY location（such as
 loaded into the AFFAY in lines 160－180．The FANDOM shower order is determined in 1 ines $200-250$ ．Can you figure out why a name $i s n ' t$ picked more than once？

COMIMODOFE
Bonus Frogram \＃B NUMEEF GAME FOR TWO
Computers are great for playing games．They can be programmed to make games，both unpredictable and exciting． Here is a super game for two people．The computer＂pulls a number out of its hat＂，and the players take turns trying to guess the number．The player with the most correct guesses， after seven rounds，is the champ．Switch sides after seven rounds．You will be surprised at the strategies involved．
10 FRINT CHFB（147）
20 FFINT＂THIS IS A NUMEEF GAME FOF TWO FEOFLE＂
$3 \triangle$ FRINT＂THE COMFUTEF FICKS A NUMEEF EETWEEN 1 AND 500．＂
40 FRINT＂THE FLAYEFS TAKE TURNS GUESSING THE NUMEEF＂
SO FRINT＂UNTIL SOMEONE GUESSES THE NUMEER＂
GO FRINT＂THE FLAYEF GUESSING THE MOST NUMBEFS，＂
70 FRINT＂AFTEF 7 ROUNDS，IS THE WINNEF＂
80 FRINT：INFUT＂WHAT IS FLAYEF \＃1＇S NAME＂：F1末
90 FRINT：INFUT＂WHAT IS FLAYER \＃2＇S NAME＂：FZZ
$100 \mathrm{~F}=\mathrm{F}+1: \mathrm{N}=\mathrm{INT}$（FND（1）＊500）+1
110 IF F＞1 THEN FRINT＂THE SCOFE IS＂F1中＂＝＂F1＂＂F2\＃＂＝＂F2
120 FOF $T=1$ TO 2500：NEXT T
130 IF $\mathrm{F} \geqslant 7$ THEN 260
140 FOF ${ }^{\top}=1$ TO 1000：NEXT $T$
150 FFIINT CHFiz（147）：FRINT＂FOUND＂R＂，＂Fi⿻三丨＂S TUFIN＂
160 FRINT：INFUT＂WHAT IS YOUF GUESS＂：G1
170 IF G1 \＆N THEN FFINT＂TOO LOW＂F1： 1 ：GOTO 200
180 IF G1＞N THEN FRINT＂TOO HIGH＂：GO TO 200
190 FFINT＂YOU GOT IT＂F1末：F1＝F1＋1：GOTO 100
200 FOF $T=1$ TO 1000：NEXT T
210．FRINT CHK末（147）：FRINT＂ROUND＂F＂，＂F2丰＂＇S TURN＂
220 FFIINT：INFUT＂WHAT IS YOUR GUESS＂：G2
230 IF G2 \＆N THEN FRINT＂TOO LOW＂：GOTO 140
240 IF G2＞N THEN FRINT＂TOO HIGH＂：GOTO 140
250 FRINT＂YOU GOT IT＂F2事：F2＝F2＋1：GOTO 100
260 FFINT CHF末（147）：FOF：$T=1$ TO 1000：NEXT T
270 IF F1＞F2 THEN FRINT F1韦＂CREAMED＂F2丰＂＂F1＂TO＂F2：END
280 FRINT F2き＂WASTED＂F1丰＂＂FZ＂TO＂FI．
The VARIABLES are：
Fit＝player \＃1
$\mathrm{F} 2 \mathrm{~F}=\mathrm{pl}$ ayer \＃2
Fi＝player \＃1 score
FZ＝player \＃2 score
G1＝player \＃1 guess
G2＝player \＃2 guess
$\mathrm{F}=\mathrm{r}$－ound\＃
T＝time delay variable
$N=s e c r e t$ number
The secret number（N）is picked in line 100．To alter the limits of the secret number，you can change the 500 to a larger or smaller number．Try 10000, for instance．In several places you may notice symbols like this：$\quad$ or this：\＆．The symbol $>$ means＂greater than＂and＜ means＂less than＂Can you make this game work with four players？

COMMODOFE

Bonus Frogram \＃9 FFiACTICAL JOFEEFi
Are you ready for some laughs？If so，Bonus Frogram \＃9 is the one for you．It＇s called the F＇FiACTICAL JOKE FROGRAM． Here＇s how it works：

You type the program into your computer while the victim isn＇t around．RUN the program．The computer will ask you questions about the victim．You answer all the questions until the computer says，＂FRESS ANY K゙EY TO START THE JOKE＂． Fress a key and the joke is ready for the victim．When the victim comes back，the computer will seem to know all about him／her．Just say that you＇re hooked up to the MASTER COMPUTEF，and it knows EVEFYTHING！！！

10 FRINT CHR丰（147）
20 PRINT＂PRACTICAL JOKE FFOGRAM＂
30 FOF $T=1$ TO $10 \square \emptyset:$ NEXT $T$
40 FRINT CHFi丰（147）
50 INFUT＂WHAT IS THE VICTIM＇S NAME＂；N丰
60 INFUUT＂IS THE VICTIM MALE OF FEMALE＂：MF：
70 IF MF $\ddagger=$ MALE＂DFi MF $==$ MM＂THEN G末＝＂HE＂：F末＝＂HIS＂
80 IF MF丰：＂FEMALE＂OF MF：$=$＂F＂THEN G必 $=$＂SHE＂：F果＝＂HER＂
90 FRINT＂WHAT CITY IS＂Gき＂FFOM？＂：INFUT C丰
100 FRIINT＂HOW OLD IS＂G末＂NOW？＂：INFUT A
110 FFIINT＂WHAT IS＂F＂丰＂FAVOFITE HOEEY＂：INFUT H丰
120 FFINT＂WHAT IS＂F末＂NICKNAME＂：INFUT NN\＆
130 FRINT＂FFESS ANY KEY TO STAFT THE JOKEE．＂
140 GET S丰：IF S丰＝＂＂THEN140
150 FFFINT CHFi三（147）
160 FFIINT＂FRESS A KEEY AND I WILL TALK゙ TO YOU＂
170 GET S丰：IFS＊＝＂＂THEN170
180 FFIINT＂HELLO，LET ME TFYY TO GUESS YOUF NAME．＂
190 F＇FiINT＂I＇M THINK゙ING．．．＂
20ロ GロSUB 4ロロ
210 FFINT＂YOU LOOF：LIKEE SOME TYFE OF＂N末：GOSUB40』
220 FFIINT＂EUT I HOFE YOU WON＇T MIND IF I CALL YOU＂
23ด F＇FIINT NN末：GOSUE40Ø
240 FFIINT＂THE TOUCH OF YOUF FINGEFS＂：FFINT
250 FFiINT＂LEADS ME TO EELIEVE YOU ARE AT LEAST＂：FRINT
260 FRINT A＂YEAFS OLD＂：GOSUB40』
270 FFiINT＂AND YOU SMELL LIK゙E A FEFSSON FFOM＂：FFFINT
280 FFINT C丰：GOSUB400
290 FRINT＂THE CENTFAL COMFUTEF TELLS ME YOU LIKE：＂：FRINT
300 FRINT HF：GOSUB400
310 FFiINT＂NOW，IT＇S YOUF TUFN TO ASK゙ ME A QUESTION＂
S2Ø INFUT＂TYFE YOUR QUESTION，THEN FFESS FEETURN＂：Q
उड GOSUB40』
340 PRINT＂SOFFRY，＂NN末＂THAT＇S TOO FEFSSONAL！＂
క50 FRINT＂YOUF ACCESS TO THE MASTER COMFUTER HAS＂
క6Ø FFIINT＂BEEN TEFMINATED UNTIL 1999＂：END
400 FOF $T=1$ TO 4ØØD：NEXTT：FFIINT CHF＊（147）：RETURN
continued on next page．．．．

## COMMODOFE

In the FFACTICAL JOKE program you are introduced to some new commands．Two are called GOSUE and FETUFN（not the key）． GOSUE 4DO means，＂goto the subroutine at 400＂：A SUBFOUTINE is like a program，within a program．FETUFN means＂return to the main program＂：A SUBFOUTINE always starts with GOSUE and ends with FETUFN．This SUEFOUTINE，line $40 \square, ~ c a u s e s ~ a ~$ time delay and clears the screen．In lines 140 and 170 is another，new command，called GET．GET S丰 tells the computer to wait for a key to be pressed．In line 140 ，if no key is pressed，the computer waits at line 140．When a key is pressed，the program proceeds on to line 150.

VAFIAELES are：
$T=t i m e ~ d e l a y$ N末＝victim＇s name MF：＝male or female Gi＝he or she
C丰＝city
$\mathrm{A}=\mathrm{age}$
How＝hobby
NN：＝＝nick：name
F＇末＝his or her
Q：$:=$ question
S央＝get variable

COMMODOFE
Eonus Frogram \#10 MATH SHARFENEF:
This program is called the MATH SHARFENER. I've been saving this program for the whiz kids. You must be one, or you wouldn't be reading this. The MATH SHAFiFENER has been designed to quiz both the beginner, and the advanced, on basic math skills. Don't use a scratch pad and I assure you, you'll get a work out. You will receive instructions when you FUN the program.

10 FEEM***MATH SHAFiFENEF***
20 FFiNT CHFま (147)
S0 FFiINT"THIS IS A FFROGRAM TO SHARFEN YOUR MATH"
40 PRINT
5Ø FRINT "CHOOSE:1)EASY 2)HARD, THEN FRESS FETUFN"
60 INFUT L
70 FFinNT"THE SYMEOLS ARE:"
80 PRINT"+ ADD - SUBTRACT"
90 PRINT"* MULTIFLY / DIVIDE":FRINT
100 FRINT"EXAMFLES: "
110 FRINT"2+3=5 8-4=4"
120 FFINT"2*4=8 9/3=3":FRINT
$1 \Xi 0$ FRINT"FICK THE NUMEEF OF THE FUNCTION"
140 FRINT"YOU WANT TO FRACTICE: ":FRINT
150 FRINT"1)ADD"
160 FFiINT"2)SUBTRACT"
170 FRINT"З)MULTIFLY"
180 FFINT"4)DIVIDE"
190 INFUT D
200 FFiINT CHFi三(147):FRINT"TYFE THE NUMEER OF QUESTIONS"
210 INFUT"YOU WANT, THEN FRESS RETURN": 0
220 FOF T=1 TO ©
2S0 FFINT"ANSWEF THE FROELEM, THEN FRESS RETURN":FFIINT
240 IF $L=1$ THEN $A=\operatorname{INT}(\operatorname{FND}(1) * 1 \varnothing)+1: B=\operatorname{INT}(\operatorname{FND}(1) * 10)+1$
250 IF $L=2$ THEN $A=I N T(F N D(1) * 200)+1: B=I N T(F N D(1) * 200)+1$
260 IF $D=2$ AND $A<B$ THEN 240
270 IF $D=4$ AND $A<B$ THEN 240
280 IF $D=4$ AND $A / B<>\operatorname{INT}(A / B)$ THEN240
290 IF $A=E$ OF $B=1$ THEN 240
S00 IF D=1 THEN FRINT A"+"B"=":: INFUTC
310 IF D=2 THEN FRINT A"-"E"=";:INFUTC
320 IF $D=3$ AND L=1 THEN FRINT A"*"B"=";:INFUT C
3Sర IF D=3 AND L=2 THEN FRINT INT (A/5)"*"INT (E/5)"=":: INFUTC
340 IF D=4 THEN FRINT A"/"B"=";: INFUTC
continued on next page...

## COMMODOFE

```
S0 F'FIINT
360 IF D=1 AND C=A+E THEN S=S+1:FFFINT "ALFIIGHT!":GOTO490
Z70 IF D=2 AND C=A-E THEN S=S+1: FFINT"RIGHT ON!":GOTO490
380 IF D=S AND L=1 AND C=A*E THEN S=S+1:Z=1
390 IF Z=1 THEN FFIINT "CORFECT!": }\textrm{Z}=0:GOTO49
40| IF D=\Xi AND L=2 AND C=INT (A/5)*INT (B/5) THEN S=5+1:Z=2
410 IF }Z=2 THEN FFIINT "GREAT!": Z=|:GOTOSDQ
420 IF D=4 AND C=A/E THEN S=S+1:FFIINT"YOWSAH!":GOTO490
43\oslash FFRINT"YOU GOOFED. THE ANSWER WAS:";
440 IF D=1 THEN FFIINT A+E
450 IF D=2 THEN FRINT A-B
460 IF D=\Xi AND L=1 THEN FFFINT A*E
470 IF D=3 AND L=2 THEN FFFINT INT (A/5)*INT (B/5)
480 IF D=4 THEN FFIINT A/E
490 FOF W=1TO800:NEXT W:FFINT CHF*&(147):NEXT T
50@ FFRINT"YOUF SCOFE IS: "S" OUT OF "G" FIGHT!"
510 FFINT"FFESS ANY ドEY TO CONTINUE"
520 GET A⿻三: IF A*= ""THENS20
5.30 S=0:GOTO 10
The VAFIABLES are:
L=easy/hard
D=function to practice
Q=# of questions
T=question loop
A=random number 1
E=r andom number 2
C=choice (your answer)
W=delay
S=score
A⿻三丨=get variable
Z=correct multiplication flag
If you have problems getting this program to work properly， double check lines 240－500．These are the lines where most of the mathematical processing takes place．In this section，if \(D=1\) ，then you are adding；if \(D=2\) ，you are subtracting；\(D=\Sigma\) ，means multiplying：and \(D=4\) signifies division．If \(L=1\) ，then the quizzes are easy．If \(L=2\) ，then the quizzes are hard．Should you have the desire to make the program more difficult，you can increase the fiANDOM NUMEEFS，in lines 240－250．
```

TI 99／4A

Eonus Frogram \＃1 CAFTOON FOBOT
ELAST OFF！is a computer cartoon in which the count down and blast off of a rocket takes place on your $t . v$ ．screen．

10 CALL CLEAF
20 FOF C＝10 TO 1 STEF－ 1
ミ FFINT C
40 FOF T＝1 TO 200
$5 \square$ NEXT T
60 CALL CLEAF
70 NEXT C
80 CALL CLEAFi
90 FFiINT＂BLAST OFF！！！！＂
100 FOF $T=1$ TO 200
110 NEXT T
The above lines tell the computer to count down，from 10 to 1 then print，＂ELASTOFF！＂．

Now add these to the lines above：

120 CALL CLEAF
$13 \square$ FRINT＂ヘ＂
140 FFINT＂／\＂
150 FFiNT＂！！＂
160 FFiNT＂！U！＂
170 FFINT＂！！＂
180 FFINT＂！5！＂
190 FFINT＂！！＂
200 FFINT＂！A！＂
210 FFINT＂！！＂
2ミロ FFINT＂
240 FFINT：：：：：：：：：：：：：：：：：：：：：：

To make the nose cone on the rocket，hold down the SHIFT key and press the NUMEEF 6 key．The slanted lines，on the right side of the rocket，are created by holding down the FCTN key and pressing $Z$ key．The slanted lines on the left side of the rocket can be printed by pressing the $/$ key（just above the ENTEF key）．In line 240 you need to make at least twenty－five COLONS．Each COLON tells the computer to print a blank line．Type FUUN，then press ENTEF to see the rocket BLAST OFF！

## Bonus Frogram \＃2 FAMILY DECISION MAKER

How would you like to use your home computer for solving problems like，＂Who will use the computer first，Jimmy or Eobby？＂．．．or how about，＂Should we use the $t$ ．$v$ ．to watch a movie，or play with the computer？＂．The FAMILY DECISION MAEEF can help you solve these problems，and more．It will make the decision for you，by picking a random choice．All you have to do is to type in the options．

10 FANDOMIZE
20 call cleaf
30 FFINT＂FAMILY DECISION MAKEF＂
40 FOR $T=1$ TO 1500
50 NEXT T
60 CALL CLEAR
70 FFINT＂TYFE IN THE OFTIONS AND＂
80 FRINT＂THE COMFUTER WILL DECIDE．＂
90 FRINT＂WHAT IS OFTION \＃1＂
100 INFUT 01韦
110 FRINT＂WHAT IS OFTION \＃2＂
120 INFUT 02丰
130 FFINT＂I＇M THINKING IT QVEF．．．．．．＂
140 FOR $T=1$ TO 1000
150 NEXT T
$160 \mathrm{C}=\mathrm{INT}($ RND $* 2)+1$
170 CALL CLEAF
180 FRINT＂MY CHOICE IS：＂
190 IF $\mathrm{C}=2$ THEN 220
200 PRINT 01韦
210 END
220 FRINT 02＊

In this program the computer makes its choice in line 160. Lines 180 to 150 are where the computer is，＂thinking it over＂．You probably noticed that the computer isn＇t really ＂thinking it over＂．It＇s actually counting up to 1000, then executing line 160 ．The choice is printed on the screen in lines 180－220．

The VARIABLES are：
T＝time delay
C＝choice
01．$=$ ooption＇\＃1
02丰＝option \＃2

TI 99/4A
Bonus Frogram \#3 MıF.G: FECORDEF
If you're like me, you never take the trouble to figure out your car's miles per gallon (M.Fi.G.). Even having a calculator handy has never helped, though there are only three basic numbers to calculate. This is one more instance in which wanting to use my computer motivates me to do the fairly simple task I've managed to ignore. My mechanic tells me that $I$ should check my M.F.G. after every five fill-ups. That way, if my M.F'G. starts dropping, I can take my car in for a checkup...before it's too late.

10 CALL CLEAF
20 FFint "MFG CALCULATOF"
$30 \mathrm{FOF} T=1$ TO 1500
40 NEXT T
50 CALL CLEAF
60 FRINT "THIS FFOGRAM DETEFMINES"
70 FRINT "THE MFG YOUF CAR GETS."
BØ FFINT "HOW MANY MILES DID YOU DFIVE"
90 FRINT "DURING THE FAST 5 FILL-UFS"
100 INFUT M
110 FRINT "HOW MANY GALLONS OF GAS DID YOU"
120 FRINT "USE IN THE FAST 5 FILL--UF'S"
130 INFUT G
$140 \mathrm{MPG}=\mathrm{M} / \mathrm{G}$
150 FRINT "YOU HAVE EEEN GETTING":MFG
160 FFINT "MILES FEF GALLON"
Notice that we used $G$ as the VAFIABLE for gas, M as the VAFIABLE for miles, and MFG as the VARIABLE for miles per gallon. In line $140, \operatorname{MFG} \mathrm{M} / \mathrm{G}$ means miles per gallon equals miles divided by gallons.

Eonus Frogram \＃4 COUFON CALCULATOFi
Computers are pretty good at solving problems and presenting the results in a manner which is easy to read． This program can be used to display the amount of money you will save with your shopping coupons．

10 CALL CLEAFi
20 FFiINT＂COUFON CALCULATOF＂
S F FRINT
40 FRINT＂FIND OUT WHAT YOU＇LL SAVE＂
50 FFIINT＂WITH YOUF SHOFFING COUFONS＂
6Ø FFFINT＂ANSWEF THE QUESTION＂
70 FFiINT＂THEN FFiESS THE ENTEF ドEY＂
80 FFIINT
90 FFIINT＂HOW MANY COUFONS DO YOU HAVE＂
100 INFUT C
110 FFIINT
12Ø FFFINT＂TO ENTEFi VALUE OF A COUFON＂
$1 \Xi 0$ FFIINT＂DON＇T USE A DOLLAF SIGN＂
140 FFIINT＂DO USE A DECIMAL FOINT＂
150 FFiINT
160 FQF $E=1 \mathrm{TO} \mathrm{C}$
170 FFIINT＂ENTEF VALUE OF CDUFON \＃＂：E
180 INFUT A
$190 \mathrm{~T}=\mathrm{T}+\mathrm{A}$
こロロ NEXT E
210 F＇FINT
ごコロ FFiINT＂末＂：T；＂WILL EE SAVED＂

The VAFIAELES in this program are：
C＝number of coupons
E＝coupon\＃
$A=$ value of coupons
T＝total value of coupons

Line 190 adds up the total，each time a value is entered into the computer．Line z20 prints the total value to be saved．

TI 99/4A
Bonus Frogram \#5 SFOFTS FDFECASTEFi
The SFOFTS FOFECASTEF can be a handy program if you enjoy sports. This program will take a team's current record and project, based on winning percentage, what the team's record will be at the end of the season.

10 CALL CLEAF
20 FFINT "SFOFTS FOFECASTEF"
Zロ FOF $Z=1$ TO $50 \square$
40 NEXT Z
50 FFINT
60 FFIINT "TO FORECAST A TEAM‘S"
70 FFiNT "FINAL WIN AND LOSS FECORD"
80 FFINT "EASED ON ITS CUFFENT FECORD"
90 FRINT
100 FFINT "ANSWEF THE QUESTION"
1.10 FRINT "THEN FFESS ENTEF"

120 FFiINT
$1 \Xi 0$ FFINT "ENTEF TOTAL GAMES TEAM FLAYS"
140 INFUT T
150 FFINT
160 FFint "HOW MANY WINS DO THEY HAVE"
170 INFUT $W$
180 FFind "HOW MANY LOSSES DO THEY HAVE"
190 INFUT L
$200 \mathrm{~F}=\mathrm{W} /(W+\mathrm{L})$
$210 \mathrm{Y}=\mathrm{T} * \mathrm{~F}$
$220 \mathrm{D}=\mathrm{T}-\mathrm{Y}$
2SØ FFiINT "END OF THE SEASON FFROJECTION"
240 FFINT
250 FRINT "WINS=":INT(Y):"LOSSES="; INT(D)+1
The VARIABLES are:
$Z=t i m e ~ d e l a y ~ v a r i a b l e ~$
T=total games in season
$W=$ games won
L=games lost
$\mathrm{F}=$ =percentage of games won
$Y=e n d$ of year games projected won
$\mathrm{D}=$ end of year games projected lost
The forecast is completed in line 200 when the winning percentage ( $F$ ) is established by dividing the number of completed games ( $W+L$ ) into the total games won so far (W). The total wins for the year is estimated by multiplying the amount of games in the season (T) by the winning percentage (F). The year end losses are determined by subtracting the end of year projected games won (Y) from the total games in the season ( $T$ ).

## Eonus Frogram \＃6 SHDWEF MONITOF

Getting into the shower，day after day，and finding cold water can be a drag．I＇m sure that large families know what I＇m talking about．Eonus Frogram \＃7 has been designed to whip，morning bathroom confusion．It＇s called the SHOWEF MONITOR．You type in the names and the computer pict：s the shower order．

10 FANDOMIZE
20 CALL CLEAFi
30 FFiINT＂SHOWEF MONITOF＂
40 FDF $T=1$ Tロ 2ロロロ
50 NEXT T
60 CALL CLEAFi
70 FFiINT＂THIS FFOGFAM WILL HELF＂
80 FFiINT＂DECIDE，IN A FAIF WAY＂
90 FFIINT＂THE MOFNING SHOWEF OFDER＂
100 FFFINT
110 PFINT＂TYFE ANSWEF THEN ENTEF＂＂
120 FFINT＂HOW．MANY IN YOUF FAMILY＂
$1 \Xi \square$ INFUT $F^{\prime}$
140 FFIINT
150 FFINT＂TYFE IN THE NAMES，DNE AT＂
160 FFIINT＂A TIME．THEN FFESS ENTEF＂
170 FQF $H=1$ TO $\mathrm{F}^{\prime}$
180 INFUT N末（H）
190 NEXT H
20ロ CALL CLEAR
210 FRINT＂THIS IS THE SHOWEF OFDEF：＂
220 FOF $R=1$ TD F
$2 \Xi \quad X=I N T(F N D * F)+1$
240 IF N丰 $(X)="$ THEN 2डロ
250 FFFINT NF：（X）
260 N丰（X）＝＂＂
270 NEXT Fi
280 GOTO 280

The VAFIABLES are：
$F=$ number of people in family
$H=a r r a y ~ p a r k i n g ~ l o t \#$
$X=r$ andom number
$N \neq(X)=$ name of person $X$ in array
$F$＝counting variable

You are probably wondering what an AFiFiAY is．An AFiFiAY is a computer parking lot．In an AFifAY you don＇t park cars．
Fiather，you park：words and numbers．In this program we
parked the name of each person in an AFiFAY location（such as
 loaded into the AFFiAY in．lines 170－190．The FiANDOM shower order is determined in lines 210－220．Can you figure out why a name isn＇t picked more than once？

TI 99／4A

## Eonus Firogram \＃7 ELECTION RETUFiN

Stage a mock：primary with four candidates．Twenty－five precincts report，one at a time．Funning totals are printed as each reports．When all the returns are in，the computer displays the final results．

10 CALL CLEAR
20 FRINT＂ELECTION RETURNS＂
$\Xi \square$ FOF $A=1$ TO 1500
40 NEXT A
50 FOR $X=1$ TO 4
60 FRINT＂INFUT NAME OF CANDIDATE \＃＂： X
70 INFUT Nま（X）
80 NEXT X
90 CALL CLEAF
100 FFinN＂THE FOLLS JUST CLOSED＂
110 FFINT＂$\%$ THE FESULTS AFE COMING IN＂
114 FOF $Y=1$ TO 500
118 NEXT Y
120 FOF $F=1$ TO 25
130 FOR $X=1$ TO 4
140 FANDOMIZE
$150 N(X)=$ INT（FND＊999）+1
160 NEXT $X$
170 CALL CLEAF
180 FRIINT＂FFECINCT \＃＂：F：＂RESULTS＂．
190 FOR $X=1$ TO 4
200 FRINT $N(x) ; "-" ; N \neq(x)$
$210 \mathrm{~T}(\mathrm{X})=\mathrm{N}(\mathrm{X})+\mathrm{T}(\mathrm{X})$
220 NEXT $X$
$2 \Xi 0 \mathrm{FOR} \mathrm{B}=1$ TO 1000
240 NEXT B
250 FFINT
260 FFINT＂CUFFENT TOTALS：＂
270 FOF $X=1$ TO 4
280 FRINT $T(X): "--" ; N \neq(X)$
290 NEXT X
300 FOF C＝1 TO 1000
310 NEXT C
320 NEXT F
30 CALL CLEAF
S40 FFINT＂ALL FETUFNS IN，AND＂
ङ50 FFint＂THESE ARE THE TOTALS：＂
360 FOF $X=1$ TO 4
370 FFiINT T（X）：＂一＂：Nま（X）
SBO NEXT $X$
continued on next page．．．．．

The VARIABLES are:
$N \neq(X)=$ candidates names $1-4$
$N(X)=$ votes per/precinct candidates $1-4$
$T(X)=$ votes total each candidate $1-4$
$A=t i m e ~ d e l a y 1$
$\mathrm{B}=\mathrm{time}$ delayz
$C=t i m e ~ d e l a y \underset{~}{\text { a }}$
F=precinct \#
$X=a r r a y s$ laading variable
In lines $50-80$ the candidates names are loaded into an array called $N \neq(X)$. The vote totals, for each precinct, are generated by 1 ine 150 . The precinct totals and subtotals
 final results.

TI 99／4A
Eonus Frogram \＃B FFiACTICAL JOKEFi
Are you ready for some laughs？If so，Bonus Frogram \＃8 is the one for you．It＇s called the FFiACTICAL JOKE FROGRAM． Here＇s how it works：

You type the program into your computer while the victim isn＇t around：FUN the program．The computer will ask you questions about the victim．You answer all the questions until the computer says，＂FRESS ANY KEY TO START THE JOKE＂． Fress a key and the joke is ready for the victim．When the victim comes back，the computer will seem to know all about him／her．Just say that you＇re hooked up to the MASTEF COMFUTEF，and it knows EVEFIYTHING！！！

10 CALL CLEAF
20 FFind＂FFiACTICAL JOKE FROGRAM＂
30 FOF T＝ 1 TO 1000
40 NEXT T
50 CALL CLEAF
60 FRINT＂WHAT IS THE VICTIM＇S NAME＂：
70 INFUT Nま
80 FRINT＂IS THE VICTIM MALE OF FEMALE＂：
90 INFUT MFま
100 IF MF $==$ MMALE＂THEN 120 ELSE 110
110 IF MF $==" M "$ THEN 120 ELSE 140
$120 \mathrm{G} \ddagger=$＂HE＂
$130 \mathrm{~F} \ddagger=$＂HIS＂
140 IF MF $=$＝＂FEMALE＂THEN 160 ELSE 150
150 IF MF末＝＂F＂THEN 160 ELSE 180
160 G末＝＂SHE＂
170 F ：$=$＂HEF＂
180 FRINT＂WHAT CITY IS＂：Gき：＂FFOM＂：
190 INFUT C ©
200 FFINT＂HOW OLD IS＂：G末：＂NOW＂：
210 INFUT A
220 FFint＂WHAT IS＂：F゙：$"$ FAVORITE HOEBY＂；
230 INFUT H ：
240 FFint＂WHAT IS＂：Fis：＂NICKNAME＂：
250 INFUT NN末
260 FRINT＂FFEESS ENTER TO EEGIN JOKE．＂：
270 INFUT S
280 CALL CLEAF
290 FFINT＂FFEESS ENTER KEY \＆I＇LL TALK＂
30』 INFUT S
310 FRINT＂I CAN GUESS YOUF NAME＂
玉20 FRINT＂I＇M THINKING．．．＂
350 GOSUB 700
340 FFiINT＂YOU LOOK LIKE＂：N＊；
350 GOSUE 700
S60 FFint＂I＇LL JUST CALL YOU＂：
370 FRINT NN
SBD FFiINT＂IF THAT＇S OKAY＂
390 GOSUB 700
continued on next page．．．．．．

TI 99／4A

```
400 FFINT "THE TOUCH OF YOUF FINGERS"
410 FRINT
420 FRINT "TELLS ME YOU AFE"
4.30 PRINT
440 FFiINT A:"YEARS OLD"
450 GOSUB 700
460 FRINT "YOU SMELL LIKE A FEFISON FFOM"
470 FFIINT C*
480 FFIINT
490 GOSUB 700
500 FRINT "COMFUTER CENTRAL TELLS ME"
510 FFINT "THAT YOU DIG"
520 FRINT H:
530 GOSUE 700
540 FRIINT "NOW, YOU ASK ME A QUESTION"
550 FRINT "TYFE OUESTION, THEN ENTER"
5 6 0 ~ I N F U T ~ Q \& ~
570 GOSUB 700
580 FRINT "THAT'S TOO FEFSONAL!!!"
5 9 0 ~ F R I N T ~ " Y O U F ~ A C C E S S . H A S " ~
600 FFiNNT "EEEN TEFMMINATED UNTIL 1999" .
610 END
700 FOR T=1 TO 3000
710 NEXT T
7 2 0 ~ C A L L ~ C L E A F :
7ミ0 FETURN
```

In the FRACTICAL JOKE program you are introduced to some new commands．Two are called GOSUB and FETURN（not the key）． GOSUB 700 means，＂goto the subroutine at 700 ．A SUEFOUTINE is like a program，within a program．RETURN means＂return to the main program＂．A SUBROUTINE always starts with GOSUB and ends with ENTEF．This SUBFOUTINE，bedinning at line 700 ，causes a time delay and clears the screen．
The command ELSE worts with IF and THEN．If the condition isn＇t met in an IF／THEN statement，ELSE gives an alternate line number to GOTO．

VAFIABLES are：
T＝time delay N $\ddagger=$＝victim＇s name
MFF＝male or female
GF＝he or she
C．$=$＝city
$\mathrm{A}=\mathrm{age}$
$\mathrm{H}=$＝hobby
NN：
P丰＝his or her
 S事＝continue

TI 99/4a

Eonus Frogram \#9 NUMEEF GAME FOF TWO
Computers are great for playing games: They can be programmed to make games, both unpredictable and exciting. Here is a super game for two people. The computer "pulls a number out of its hat", and the players take turns trying to guess the number: The player with the most correct guesses, after seven rounds, is the champ. Switch sides after seven rounds. You will be surprised at the strategies involved.

```
10 FIANDOMIZE
20 CALL CLEAF
SO FFIINT "WHAT IS FLAYEF # 1'S NAME"
40 INFUT F1车
5 0 ~ F F F I N T
60 FFIINT "WHAT IS FLLAYEF # 2'S NAME"
70 INFUT F2%
80 Fi=Fi+1
90 N=INT (RNND*S00) +1
100 IF F`1 THEN 110 ELSE 130
110 FFiNT "THE SCORE =":F1毒;"=":A;" ":F2&;"=":B
120 IF F>7 THEN 460
130 FOR T=1 TO 1000
140 NEXT T
150 CALL CLEAR
160 FFIINT "FOUND":F;", ";F1%:"'S TURN"
170 FFINT
180 FFINT "WHAT IS YOUF GUESS"
190 INFUT G1
200 IF G1&N THEN 210 ELSE 220
210 GOSUB 530
220 IF Gi<N THEN 290
230 IF G1>N THEN 240 ELSE 250
240 GOSUB 550
250 IF G1>N THEN 290
260 FFINT "YOU GOT IT"
270 A=A+1
280 GOTO 80
290 FOF T=1 TO 1000
300 NEXT T
310 CALL CLEAR
320 FRIINT "FOUND";F;", ";F2&:"'S TURN"
3S0 FFINT
340 FFINT "WHAT IS YOUF GUESS"
350 INFUT G2
$60 IF G2<N THEN 370 ELSE S80
370 GOSUB 530
380 IF G2<N THEN 130
390 IF G2>N THEN 400 ELSE 410
400 GOSUB 550
410 IF G2>N THEN 1SO
4 2 0 ~ F F I N T ~ " Y O U ~ G O T ~ I T " ,
4ड E=E+1
440 GOTO 80
continued on next page.....
```

TI 99／4A
450 CALL CLEAF
$460 \mathrm{FOF} \mathrm{T}=1 \mathrm{TO} 1000$
470 NEXT T
480 IF A＞E THEN 490 ELSE 510
490 FRINT Fit：＂CREAMED＂：F2末；＂＂：A：＂TO＂：B
500 END
510 FFINT FZ丰：＂WASTED＂：F1き：＂＂：B；＂TO＂：A
520 END
5ङØ FRINT＂TOO LOW＂
540 RETURN
550 PRINT＂TOO HIGH＂
560 RETURN
The VARIAELES are：
Fif＝player \＃1
F2丰＝player \＃2
A＝player \＃1 score
B＝player \＃2 score
G1＝player \＃1 guess
G2＝player \＃2 guess
$\mathrm{F}=$ round\＃
T＝time delay variable
$\mathrm{N}=$ secret number
The secret number（ $N$ ）is picked in line 90．To alter the limits of the secret number，you can change the 500 to a larger or smaller number．Flayer \＃1＇s turn occurs in lines 160－280．Flayer \＃2＇s turn takes place in $320-440$ ．The final results are displayed in $450-500$ ．In several places you may notice symbols like this：$>$ or this：＜．The symbol＞means＂greater than＂and \＆means＂less than＂． Can you make this game work with four players？

TI 99/4A

Eonus Firogram \#10 MATH SHAFiFENEFi
This program is called the MATH SHARFENER. I ve been saving this program for the whiz kids. You must be one, or you wouldn't be reading this. The MATH SHAFFENER has been designed to quiz both the beginner, and the advanced, on basic math skills. Don't use a scratch pad and. I assure you, you'll get a work out. You will receive instructions when you FiUN the program.
10 FANDOMIZE
$20 \mathrm{~S}=0$
EO CALL CLEAF
40 FFINT "MATH SHAFFENEF"
50 FRINT
60 FRINT "CHOOSE: 1)EASY 2)HAFD"
70 FFINT "THEN FRESS ENTER"
80 INFUT L
90 FFINT "THE SYMECLS AFE:"
100 FRINT "+ ADD - SUBTRACT"
110 FFINT "* MULTIFLY / DIVIDE"
120 FRINT
130 FFINT "EXAMFLES:"
140 FFiNT "2+3=5 8-4=4"
150 FFiINT $" 2 * 4=8 \quad 9 / 3=3 "$
160 FFiINT
170 FFiINT "FICK THE \# OF THE FUNCTION"
180 FRINT "YOU WANT TO FFACTICE"
190 FFiINT
200 FRINT "1)ADD"
210 FRINT "2)SUBTRACT"
220 FRINT "ङ)MULTIFLY"
230 FFINT "4)DIVIDE"
240 INFUT D
250 CALL CLEAF
260 FFiNT "TYFE THE \# OF QUESTIONS"
270 FRINT "YOU WANT. THEN FFESS ENTEF"
280 INFUT $\square$
290 FOF T=1 TO ©
300 PRINT "ANSWEF THE FFROELEM"
310 FRINT "THEN FRESS ENTEF"
320 FFiINT
3 S 0 IF $L=1$ THEN 340 ELSE 370
$340 \mathrm{~A}=\mathrm{INT}(\mathrm{FND} * 10)+1$
$350 B=I N T(F N D * 10)+1$
360 GOTO 390
$370 \mathrm{~A}=\mathrm{INT}(\mathrm{FND} * 200)+1$
$380 \mathrm{E}=\mathrm{INT}$ (FND*200) +1
390 IF $D=2$ THEN 400 ELSE 410
400 IF $A<B$ THEN SSD
410 IF $\mathrm{D}<>4$ THEN $4 \leq 0$
continued on next page.....

## TI 99/4A

```
420 IF A<B THEN S30
4\XiØ IF D=4 THEN 440 ELSE 450
440 IF A/E <> INT(A/E) THEN \Xi\Xi\emptyset
450 IF A=E THEN SOD
460 IF E=1 THEN \XiS0
470 IF D=1 THEN 480 ELSE 500
480 FFINT A;"+";E;"=";
490 INFUT C
500 IF D=2 THEN 510 ELSE 5.B0
510 FFFINT A;"-";E;"=";
520 INFUT C
5S0 IF D=\Xi THEN 540 ELSE 600
540 IF L=1 THEN 550 ELSE 570
550 FRFINT A; "*";B!"=";
560 INFUT C
570 IF L=2 THEN 580 ELSE 600
580 FFiINT INT(A/5):"*";INT(E/5):"=";
5 9 0 ~ I N F U T ~ C
600 IF D=4 THEN 610 ELSE 6SO
610 FFIINT A;"/";E;"=";
6こØ INFUT C
GOD FFIINT
640 IF D=1 THEN 650 ELSE 690
650 IF C=A+B THEN 660 ELSE 690
660 S=5+1
670 FFINT "ALFIGHT!"
680 GOTO 1060
690 IF D=2 THEN 700 ELSE 740
700 IF C=A-E THEN 710 ELSE 740
710 S=S+1
720 FFIINT "FIGHT ON!"
730 GOTO 1060
740 IF D=\Xi THEN 750 ELSE 850
750 IF L=1 THEN 760 ELSE 800
760 IF C=A*E THEN 770 ELSE 850
770 S=S+1
780 FFIINT "CDFFIECT!"
790 GOTO 1060
800 IF L=2 THEN 810 ELSE 850
810 IF C=INT(A/5)*INT(B/5) THEN 820 ELSE 850
820 S=S+1
8E FFIINT "UNEELIEVABLE!"
840 GOTD 1060
850 IF D=4. THEN 860 ELSE 900
860 IF C=A/B THEN 870 ELSE 900
870 S=5+1
880 FFIINT "YOWSAH!"
890 GOTO 1060
9DD FFFINT. "YOU GOOFED/THE ANSWEFI IS ":
910 IF D=1 THEN 920 ELSE 940
920 FFFIINT A+E
9`0 GOTO 1060
940 IF D=2 THEN 950 ELSE 970
```

continued on next page......

```
TI 99/4A
```

950 FFINT A-E
960 GOTO 1060
970 IF $\mathrm{D}=3$ THEN 980 ELSE 1040
980 IF $L=1$ THEN 990 ELSE 1010
990 FFINT A*B
1000 GOTO 1060
1010 IF L $=2$ THEN 1020 ELSE 1040
1020 FRINT INT (A/5) *INT (E/5)
1030 GOTO 1060
1040 IF $\mathrm{D}=4$ THEN 1050 ELSE 1060
1050 FFINT A/B
$1060 \mathrm{FOF} W=1$ TO 1000
1070 NEXT W
1080 CALL CLEAR
1090 NEXT T
1100 FFINT "YOUF SCOFE IS ":S
1110 FFINT " OUT OF ":日!" RIGHT!"
1120 FFINT "FFEESS ENTEF TO CONTINUE"
1130 INFUT AF
1140 GOTO 10

The VAFIABLES are:
L=easy/hard
D=function to practice
Q=\# of questions
T=question loop
A=random number 1
$\mathrm{E}=\mathrm{r}$ andom number 2
$\mathrm{C}=$ choice (your answer)
W=del ay
S=score
$A$ $⿻$ = continue
If you have problems getting this program to work properly, double check the lines mentioned in EFROR STATEMENTS.
Fietype the lines that look wrong. In this program, if $\mathrm{D}=1$, then you are adding: if $D=2$, you are subtracting; $\mathrm{D}=3$, means multiplying: and $D=4$ signifies division. If $L=1$, then the quizzes are easy. If $L=2$, then the quizzes are hard. Should you have the desire to make the program more difficult, you can increase the RANDOM NUMEEFS, in lines 340-380.

TIMEX

Eonus Frogram \#1 CAFTODN FIOEDT

Fiddle: What's sweet, but square: high tech, yet down to earth; and brilliant, with the I. Q. of a doughnut?

Give up?
The answer is: The Fantabulous kissing fobot
You'll key in a program using FOF and NEXT to make a cartoon. The commands FOF and NEXT are used for counting.

14 CLS
16 FRINT "()***********()"

30 FOF $T=1$ TO 10
31 NEXT T
32 CLS



38 FFiINT "** (0) (-) **"
40 FRINT "** **"
42 FFiINT ${ }^{\prime * *} \quad V \quad * * "$
44 FRINT "** **"
46 FRINT "** ***"
48 FOR T = 1 TO 10
49 NEXT T
50 CLS
52 FRINT "()***********()"
54 FFIINT "*****"
56 FFFINT "** (D) (D) **"
58 FFFINT "*****"
6』 FRIINT "** $V$ **"
62 FFIINT "** **"
64 FFIINT "** 0 **"
66 FOF $T=1$ TO 10
67 NEXT T
68 GOTO 14

This program work:s like a real cartoon. The robot is printed on the screen, and erased, three times. Each time it is printed, there are small changes madeq which give the illusion of movement. Line 68 GOTO 14 starts the entire process over again. The FDF/NEXT commands are used as time delays between pictures. You can change the speed of the cartoon by changing the 10 , in the FOF/NEXT lines, to a different number. Decreasing the number will make the cartoon faster.

TIMEX

Eonus Frogram \＃2 FAMILY DECISION MAFEFi

How would you like to use your home computer for solving problems 1 ike，＂Who will use the computer first，Jimmy or Eobby？＂：＂or how about，＂Should we use the $t: v$ to watch a movie，or play with the computer＂＂．The FAMILY DECISION MAFEF can help you solve these problems，and more．It will mat：e the decision for you，by picting a random choice．All you have to do is to type in the options．

```
10 CLS
Z0 FFINT "FAMILY DECISION MAKEEF""
SO FOF T=1 TO 200
40 NEXT T
50 CLS
60 FFIINT "TYFE IN THE OFTIONS AND"
70 FRINT "THE COMFUTEF WILL DECIDE."
80 FFIINT "WHAT IS OFTION NUMEEF 1?"
90 INFUT A车
10Q FFINT "WHAT IS OFTION NUMEEF 2?"
110 INFUT E车
12Ø FFIINT "I AM THINKIING IT DVEF::=:."
150 FOF T = 1 TO 175
140 NEXT T
150 LET C=INT (FNDN2)+1
160 FFIINT "MY CHOICE IS:"
170 IF C=2 THEN GOTO 20囚
180 FFIINT A丰
190 STOF
200 FFiINT E丰
```

（Hint：You must LIST long programs in sections．This is done by typing LIST followed by the LINE NUMEEF you want to LIST from．Example：LIST $100 . \quad$ This would LIST lines 100 and above，until the screen is full：）

In this program the computer makes its choice in 1 ine 150. Lines 120 to 140 are where the computer is，＂thinking it over＂：You probably noticed that the computer isn＇t really ＂thinking it over＂：It＇s actually counting up to 175 ，then executing lirie 160．The computer＇s choice is printed on the screen in lines $180-200$.

The VAFIABLES are：
T＝time delay
C＝choice
A丰＝option NUMEEF 1
B车＝option NUMEEF 2

## TIMEX

Eonus Frogram \#. M. F. G. FECDFDEF

If you're like me, you never take the trouble to figure out your car's miles per gallon (M.F.G.). Even having a calculator handy has never helped, though there are only three basic numbers to calculate. This is one instance in which wanting to use my computer motivates me to do the fairly simple task: I've managed to ignore. My mechanic tells me that I should check my M.F.G. after every five fill-ups. That way, if my M.F.G. starts dropping, I can take my car in for a chectrup. . $\quad$ before it's too late.

10 CLS
20 FFIINT "MFG CALCULATOF"
30 FOR $T=1$ TO 200
40 NEXT T
50 CLS
60 FFINT "THIS FFOGRAM DETEFMINES"
7® FFIINT "THE MFG YOUF CAF GETS."
80 FFIINT "HOW MANY MILES DID YOU DFIIVE"
90 FRINT "DUFING THE FAST 5 FILL-UFS?"
100 INFUT M
110 FFINT "HOW MANY GALLONS OF EAS DID YOU"
120 FRINT "USE IN THE FAST 5 FILL-UFS?"
$1 玉 0$ INFUT $G$
140 LET MFG=M/G
150 FFINT "YOU HAVE EEEN GETTING ":MFG 160 FRINT "MILES FER GALLON"

Notice that we used $G$ as the VARIABLE for gas, M as the VAFIAELE for miles, and MFG as the VARIAELE for miles per gallon. In line 140 , MFG=M/G means miles per gallon equals miles divided by gallons.

TIMEX
Bonus Frogram \#4 .COUFON CALCULATOR
Computers are pretty good at solving problems and presenting the results in a manner which is easy to read. This program can be used to display the amount of money you will save with your shopping coupons.

10 CLS
20 FFINT "COUFON CALCULATOR"
SO FRINT
40 FRINT "FIND OUT WHAT YOU WILL SAVE"
50 FRINT "WITH YOUR SHOPFING COUFONS"
60 FRINT "ANSWER THE QUESTION"
70. FFINT "THEN PRESS THE ENTEF KEY."

80 FRINT
90 FRINT "HOW MANY COUFONS DO YOU HAVE?"
100 INPUT C
110 FRINT
120 FFINT "TO ENTER VALUE OF A COUFON"
130 FRINT "DO NOT USE A DOLLAR SIGN"
140 FRINT "DO USE A DECIMAL FOINT"
150 FRINT
160 LET T=0
170 FOR E=1 TO C
180 FRINT "ENTER VALUE OF COUFON NUMBER ";E
190 INFUT $A$
200 LET $T=T+A$
210 NEXT E
220 FFiINT
230 FRINT "末";T;" WILL BE SAVED"
The VARIABLES in this program are:
$\mathrm{C}=$ number of coupons
$E=$ coupon\#
$A=$ value of coupons
$T=$ total value of coupons
(Hint: See Frogram \#2 if you forgot how to LIST a long program.)

Line 200 adds up the total, each time a value is entered into the computer. Line 230 prints the total value to be saved.

TIMEX

## Bonus Frogram \#5 SFORTS FORECASTEF

The SFORTS FORECASTER can be a handy program if you enjoy sports. This program will take a team's current record and project, based on winning percentage, what the team's record will be at the end of the season.

10 CLS
20 FRINT "SFORTS FORECASTER"
30 FOR $Z=1$ TO 200
40 NEXT Z
50 CLS
6』 FFint "TO FORECAST THE FINAL"
70 FRINT "WIN AND LOSS RECORD OF A TEAM"
80 FRINT "BASED ON CURFENT FECORD"
90 FRINT
100 FRINT "TYFE YOUF ANSWEF"
110 FRINT "THEN FRESS ENTER"
120 FRINT
130 FRINT "ENTEF TOTAL GAMES TEAM FLAYS"
140 INFUT T
150 FRINT
160 PRINT "HOW MANY WINS DO THEY HAVE?"
170 INFUT W
180 PRINT "HOW MANY LOSSES DO THEY HAVE?"
190 INFUT L
200 LET $F=W /(W+L)$
210 LET $Y=T * P$
220 LET D $=T-Y$
230 FFIINT "END OF SEASON FROJECTION"
240 FRINT
250 FRINT "WINS=":INT(Y);" LOSSES=";INT(D)+1
The VARIABLES are:
$Z=t i m e ~ d e l a y ~ v a r i a b l e ~$
T=total games in season
$W=$ games won
L=games lost
$F=$ percentage of games won
$Y=e n d$ of year games projected won
$\mathrm{D}=$ end of year games projected lost
The forecast is completed in line 200 when the winning percentage ( $F$ ) is established by dividing the number of completed games. ( $W+L$ ) into the total games won so far ( $W$ ). The total wins for the year is estimated by multiplying the amount of games in the season ( $T$ ) by the winning percentage ( $F$ ). The year end losses are determined by subtracting the end of year projected games won (Y) from the total games in the season ( $T$ ).

TIMEX
Eonus Frogram \#b SHOWER MONITOF
Getting into the shower, day after day, and finding cold water can be a drag. I'm sure that large families k:now what I'm talking about. Bonus Program \#6 has been designed to whip morning bathroom confusion. It's called the SHOWER MONITOR. You type in the names and the computer picks the shower order. (Hint: To make DIM press "D". DIM N: $(10,15)$ tells the computer that there will be a total of no more than 10 names with up to 15 letters each.)

10 DIM NF $(10,15)$
20 FFINT "SHOWER MONITOR"
$30 \mathrm{FOR} T=1$ TO 250
40 NEXT T
50 CLS
60 FFint "THIS FROGRAM WILL HELF"
70 FRINT "DECIDE, IN A FAIR WAY,"
80 FRINT "THE MOFNING SHOWER ORDEF"
90 FRINT
100 FFINT "TYFE ANSWEF, THEN FRESS ENTER"
110 FRINT "HOW MANY IN YOUR FAMILY?"
120 INFUT $F$
130 FRINT
140 FRINT "TYFE IN THE NAMES, ONE AT"
150 FRINT "A TIME. THEN FRESS ENTER"
160 FOR $H=1$ TO F
170 INFUT $\mathrm{N}=(\mathrm{H})$
180 NEXT H
190 CLS
200 FFINT "THIS IS THE SHOWER ORDEF:"
210 FOR $\mathrm{F}=1$ TO 20
220 LET H=INT (RND*F) +1
230 IF $N\left(\begin{array}{l}(H)=" " \text { THEN GOTO } 220\end{array}\right.$
240 FFiINT N $⿻$ (H)
250 LET $N *(H)=" "$
260 NEXT Fi
The VARIABLES are:
$F=$ number of people in family
H=array parking lot\#
$\mathrm{H}=\mathrm{r}$ andom number
$\mathrm{N} \ddagger(\mathrm{H})=$ name of person $H$ in array.
F=counting variable
You are probably wondering what an Afifiy is. An ARFAY is a computer parking lot. In an ARRAY you don't park cars. Fiather, you park words and numbers. In this program we parked the name of each person in an ARRAY location (such as $\mathrm{N} \ddagger(1)=$ Mom", $\mathrm{N} \ddagger(2)=$ "Larry", $\mathrm{N} \ddagger(3)=$ "Rick:", etc.). The names are loaded into the AFifiA in lines $160-180$. The RANDOM shower order is determined in lines 200-260. Can you figure out why a name isn't picked more than once?

TIMEX

Eonus Firogram \#7 ELECTJON FETURNS

Stage a mock primary with four candidates. Twenty-five precincts report, one at a time. Fiunning totals are printed as each reports. When all the returns are in, the computer displays the final results.

10 DIM N: (4, 15)
20 DIM N(4)
Z DIM T(4)
40 FFINT "ELECTION FESULTS"
50 FOF $T=1$ TO 150
60 NEXT T
70 FOF $X=1$ TO 4
80 FFIINT "INFUT NAME OF CANDIDATE NUMEEF ": $X$
90 INFUT N: $(X)$
$10 \square$ NEXT $X$
110 CLS
120 FFINT "THE FOLLS JUST CLOSED,"
130 FRINT "AND THE FESULTS AFE COMING IN"
$140 \mathrm{FOF} \mathrm{T}=1 \mathrm{TO} 50$
150 NEXT T
160 FOF $F=1$ TO 25
170 FOF $X=1$ TO 4
180 LET $N(X)=$ INT (FND*999) +1
190 NEXT $X$
20Ø CLS
210 FFINT "FFECINCT NUMEER ":F;" RESULTS"
220 FOF $X=1$ TO 4
2З 0 FFIINT $N(X): "-1: N \neq(X)$
240 LET $T(X)=N(X)+T(X)$
250 NEXT $X$
260 FOF $T=1$ TO 50
270 NEXT T
280 FFINT
290 FRINT "CUFFENT TOTALS:"
BOQ FOF $X=1$ TO 4
ミ10 FFINT T (X):"-"N: (X)
320 NEXT $X$
3 BO FOF $\mathrm{C}=1 \mathrm{TO} 50$
340 NEXT C
S5D NEXT $F$
360 CLS
370 FFINT "ALL FETUFNS IN, AND"
380 FFINT "THESE AFE THE TOTALS:"
390 FOF $X=1$ TO 4
4Ø日 FRINT T(X);"-":N* (X)
410 NEXT X

A list of VAFIABLES, and a program explanation, may be found on the next page.

## TIMEX

The VARIABLES are:
$N \neq(X)=$ candidates names 1-4
$N(X)=$ votes per precinct candidates 1-4
$T(X)=$ votes total each. candidate 1-4
T=time delay
F=precinct \#
$\mathrm{X}=\mathrm{arrays}$ loading variable

In lines 70-100 the candidates names are loaded into an array called $N(x)$. The vote totals, for each precinct, are generated by line 180. The precinct totals and subtotals are printed out in lines $160-350$. Lines $390-410$ print the final results.

TIMEX
Bonus Frogram \＃B FRACTICAL JOKEFi
Are you ready for some laughs？If so，Bonus Frogram \＃8 is the one for you．It＇s called the FFiACTICAL JOKE FROGRAM． Here＇s how it works：

You type the program into your computer while the victim isn＇t around．FUN the program．The computer will ask you questions about the victim．You answer all the questions until the computer says，＂FRESS ENTER TO START THE JOKE＂． Fress ENTEF and the jok：e is ready for the victim．When the victim comes back，the computer will seem to know all about him／her．Just say that you＇re hooked up to the MASTER COMPUTER，and it knows EVERYTHING！！！（Hints：Make GOSUB by pressing＂H＂．Make RETURN by pressing＂Y＂）

10 CLS
20 FRINT＂FRACTICAL JOKE PROGRAM＂
30 GOSUB 700
40 PRINT＂ANSWEF THE QUESTION＂
50 FRINT＂THEN FRESS ENTER．＂
6® FFiNT＂WHAT IS THE NAME OF THE VICTIM？＂
70 INFUT N＊
80 FRINT＂IS THE VICTIM MALE OR FEMALE？＂
90 INFUT M\＄
100 IF $M \ddagger=$＂MALE＂THEN GOTO 120
110 IF $M$＝＂M＂THEN GOTO 120
115 GOTO 140
120 LET G末＝＂HE＂
130 LET $\mathrm{P}=\mathrm{F}=$＂HIS＂
135 IF Gis＝＂HE＂THEN GOTO 180
140．IF M\＄＝＂FEMALE＂THEN GOTO 160
150 IF M＊$=$＂F＂THEN GOTO 160
155 GOTO 80
160 LET G $5=$＂SHE＂
170 LET F $=$＂HEF＂
180 FRINT＂WHAT CITY IS＂：G末：＂FFOM？＂
190 INFUT C
200 FRINT＂HOW OLD IS＂：G\＄
210 INFUT A
220 FRINT＂WHAT IS＂；Fi；＂FAVORITE HOBBY？＂
230 INFUT HF
240 FRINT＂WHAT IS＂：Fis；＂NICKNAME？＂
250 INFUT 0丰
260 FRINT＂FRESS ENTER TO START JOKE．＂；
270 INPUT S 5
280 CLS
290 FRINT＂FRESS ENTEFi SO I CAN TALK TO YOU＂
300 INFUT S
310 FRINT＂I CAN GUESS YOUR NAME＂
32Ø FFINT＂I AM THINKING．．．＂
3ミ0 GOSUB 700
S40 FRINT＂YOU LOOK LIKE＂：N
350 GOSUB 700
continued on next page．．．．．

TIMEX

| 360 | FRint＂I WILL JUST CALL YOU＂ |
| :---: | :---: |
| 370 | FRIINT 0 |
| 380 | FRINT＂IF THAT IS OK＂ |
| 390 | GOSUE 700 |
| 400 | FFiINT＂THE TOUCH OF YOUR FINGERS＂ |
| 410 | PRINT＂TELLS ME TH⿳⺈⿴囗十一日儿 Y You are＂ |
| 420 | FFint＂AT LEAST＂ |
| 430 | FRIINT A：＂YEARS OLD＂ |
| 440 | gosub 700 |
| 450 | PRINT＂YOU SMELL LIKE A＂ |
| 460 | FFiINT＂FFROGRAMMEF I MET FFOM＂ |
| 470 | FRFINT Co |
| 480 | GOSUB 700 |
| 490 | FRINT＂THE CENTFAL COMFUTEF＂ |
| 500 | FRRINT＂TELLS me that you like＂ |
| 510 | FRINT |
| 520 | FRINT H |
| 530 | GOSUE 700 |
| 540 | FRINT＂NOW，YOU ASk ME A QUESTION＂ |
| 550 | FRINT＂TYFE YOUR QUESTION＂ |
| 560 | FRINT＂THEN FRESS ENTEF＂ |
| 570 | INFUT Qt |
| 580 | GOSUE 700 |
| 590 | FFiINT＂THAT IS TOO FERSONAL＂ |
| 600 | PRINT O： |
| 610 | FRINT＂YOUF ACCESS TO THE＂ |
| 620 | FRINT＂MASTER COMFUTEF＂ |
| 630 | FFiINT＂HAS BEEN TEFMINATED＂ |
| 640 | FRINT＂UNTIL 1999＂ |
| 700 | FOF $T=1$ TO 75 |
| 710 | NEXT T |
| 720 | CLS |
| 730 | RETUFIN |

In the FFACTICAL JOKE program you are introduced to some new commands．Two are called GOSUE and FETUFN（not the key）．
GOSUB 700 means，＂goto the subroutine at 700 ＂．A SUBFOUTINE is like a program，within a program．RETURN means＂return to the main program＂．A SUBFOUTINE always starts with GOSUB and ends with ENTER．This SUBROUTINE，beginning at line 700 ，causes a time delay and clears the screen．

VAFIAELES are：
T＝time delay
No＝victim＇s name
Mi＝male or female
Git＝he or she
C丰＝city
A＝age
H：＝hobby
O：＝nickname
F：$=$＝his or her
$0:=q u e s t i o n$
S $=$ ：continue

TIMEX

## Bonus Frogram \＃9 NUMBER GAME FOR TWO

Computers are great for playing games．They can be programmed to make games，both unpredictable and exciting． Here is a super game for two people．The computer＂pulls a number out of its hat＂，and the players take turns trying to guess the number．The player with the most correct guesses， after seven rounds，is the champ．Switch sides after seven rounds．You will be surprised at the strategies involved．

10 FFINT＂WHAT IS THE NAME＂
20 FRINT＂DF FLAYEF NUWEEF 1？＂
SO INFUT A丰
40 FFINT＂WHAT IS THE NAME＂
5Ø FFINT＂OF FLAYEF NUMEEF 2？＂
60 INFUT E丰
70 LET $\mathrm{F}=0$
80 LET $A=\square$
$9 \square$ LET $B=\square$
$10 \square L E T N=I N T(F N D * 1 D D)+1$
110 LET Fi＝Fi＋1
120 FFIINT＂THE SCOFE IS：＂：A丰：＂＝＂：A！＂＂！E末：＂＝＂：E
130 IF R 77 THEN GOTO 460
140 FOF $T=1$ TO 75
150 NEXT T
160 CLS
170 FFIINT＂FOUUND＂ョFig＂，＂』A丰＂ 5 TUFiN＂
180 FFTNT
190 FFIINT＂WHAT IS YOUF GUESS：＂
2ロQ INFUT
210 IF $Y=N$ THEN GOTO 270
220 IF Y $\because N$ THEN GOTO 250
2ธ0 GOSLE 540
240 IF Y\＆N THEN GOTO IOO
250 GOSUE 560
260 IF Y N THEN GOTO SOD
270 FFINT＂YOU GOT IT．＂
280 LET $A=A+1$
290 GOTO 10ロ
300 FOF T＝1 TO 75
I 10 NEXT $T$
シ20 CLS

340 FFINT
ESQ FFINT＂WHAT IS YOUF GUESS？＂
360 INFUT Z
S70 IF Z＝N THEN GOTD 4．
צ80 IF Z ZN THEN GOTO 410
390 GOSUE 540
continued on next page．．．．

TIMEX

```
40| IF Z<N THEN GOTO 140
410 GOSUB 560
420 IF Z\N THEN GOTO 140
4.ED FFFINT "YOU GOT IT."
440 LET E=E+1
450 GOTO 100
460 CLS
470 FOF' T=1 TO 75
480 NEXT T
490 IF B>A THEN GOTO 520
500 FFIINT A各;" CREAMED ";B立;" ";A;" TD ";E
510 STOF
520 FFIINT B&:" WASTED ";A末;" ";E;" TO ";A
5S0 STOF
540 PFINT "TOD LOW"
550 FEETUFIN
560 FRINT "TOD HIGH"
570 FiETUFIN
```

The VAFIIABLES are:
A车:player \#1
E车=player \#2
A=player \#1 score
$\mathrm{B}=\mathrm{pl}$ ayer \#2 score
$Y=p l a y e r$ \#1 guess
$Z=p l a y e r$ \#2 guess
$\mathrm{F}=\mathrm{round}$ number
T=time delay variable
$N=s e c r e t$ number

The secret number（ $N$ ）is picked in line 100．To alter the limits of the secret number，you can try changing the 100 to a larger or smaller number．In several places you may notice symbols like this：$\rangle$ or this：\＆The symbol $\rangle$ means＂greater than＂and＜means＂less than＂．Can you make this game work：with four players？

TIMEX
Eonus Frogram \＃10 MATH SHAFFENEFi

This program is called the MATH SHARFENER．It has been designed to help improve your math skills．It is set up for multiplication，but can easily be changed to work：with addition and subtraction．Don＇t use a scratch pad and I assure you，you＇ll get a work out．

10 FRINT＂THIS IS A FROGRAM＂
20 FRINT＂TO SHAFFEEN YOUR MATH＂
J FRINT
4■ FFINT＂HOW MANY QUESTIONS DO YOU WANT？＂
50 INFUT 6
60 CLS
70 LET $S=0$
80 FOF $T=1$ TO 0
90 LET $A=I N T(F N D * 20)+1$
100 LET $B=I N T($ RND $* 20)+1$
110 CLS
120 FFIINT＂ANSWEFi THE QUESTION＂
1．$\square$ PFINT＂THEN FFESSS ENTER＂
140 F＇FiINT
150 FRINT A：＂＊＂：E：＂＝？＂
160 INFUT C
170 FFINT
180 IF $C=A * E$ THEN GOTO 26ロ
190 FFINT
2ロロ FRINT＂YOU GODFED，THE ANSWEFi IS：＂：
210 FRINT $A * B$
220 FOF $X=1$ TO 75
23＠NEXT $X$
240 NEXT T
250 GOTO 310
260 FFINT＂YOU GOT IT＂
270 FOF $X=1$ TO 75
280 NEXT X
290 LET $S=S+1$
Sロロ NEXT T
310 CLS
320 FFiINT＂SCOFE＝＂：5；＂－RIGHT＂：G－S；＂－WRONG＂
330 FRINT
340 FFINT＂TD FLLAY AGAIN＂
350 FRIINT＂FRESS THE ENTEF KEY＂
360 INFUT F＇丰：
370 CLS
380 GOTO 40

A list of VAFIABLES and program information are on the next page．．．．．

TIMEX

The VAFIIABLES are:
Q=number of questions
S=score
T=question loop
$A=r$ andom number 1
$B=r$ andom number 2
C=response
$X=$ delay variable
F丰=play again

Lines 90 and $10 \square$ are where the FiANDOM NUMEEFS for the questions are decided. Increase these numbers to make the quiz harder. To mak:e the quiz work with addition, you must change all the multiplication symbols (*) to addition symbols (+). Subtraction can be accomplished in this fashion also.

Bonus Frogram \＃1 CARTOON FOBOT

Riddle：What＇s sweet，but square；high tech，yet down to earth；and brilliant，with the I．. ．of a doughnut？

Give up？

The answer is：The fabulous KISSING FOEOT

You＇ll key in a program using FOR and NEXT to make a cartoon．The commands FDR and NEXT are used for counting．

14 CLS
16 PRINT＂（）${ }^{*} * * * * * * * * * *() "$
18 FRINT＂＊＊＊＊＂
2ロ FFiINT＂＊＊（D）（D）＊＊＂
22 PRINT＂＊＊＊＊＂
24 F＇RINT＂＊＊V $* * "$
26 FRINT＂＊＊＊＊＂
28 PRINT＂＊＊－－－＊＊＂
30 FOF T $=1$ Tロ 75：NEXT T
32 CLS
34 PRINT＂（）${ }^{3} * * * * * * * * * *() "$
36 FRINT＂＊＊＊＊＂
38 FRINT＂＊＊（口）（一）＊＊＂
4』 FRINT＂＊＊＊＊＂
42 PRINT＂＊＊$V$＊＊＂
44 PRINT＂＊＊＊＊＊＂
46 Fifint＂＊＊$\quad$＊${ }^{* \prime \prime}$
48．FOR $T=1$ TO 75：NEXT T
50 CLS
52 FRINT＂（）$* * * * * * * * * * *() "$
54 PRINT＂＊＊＊＊＊＂
56 FRINT＂＊＊（D）（口）＊＊＂
58 PFiINT＂＊＊＊＊＊＂
6』 FFINT＂＊＊$V$＊＊＂
62 PRINT＂＊＊＊＊＂
64 FRINT $1 * *$ ロ $\quad$＊＊＂
66 FOR $T=1$ TO 75：NEXT T
68 GOTD 14

This program works like a real cartoon．The robot is printed on the screen，and erased，three times．Each time it is printed，there are small changes made，which give the illusion of movement．Line 68 GOTO 14 starts the entire process over again．The FOR／NEXT commands are used as time delays between pictures．You can change the speed of the cartoon by changing the 75，in the FOR／NEXT lines，to a different number．Decreasing the number will make the cartoon faster．

TFSS－80
Eonus Frogram \＃2 FAMILY DECISION MAKER
How would you like to use your home computer for solving problems like；＂Who will use the computer first，Jimmy or Eobby？＂．．．or how about，＂Should we use the $t . v$ ．to watch a movie，or play with the computer？＂．The FAMILY DECISION MAKEF can help you solve these problems，and more．It will make the decision for you，by picking a random choice．All you have to do is to type in the options．

```
10 CLS
20 FRINT "FAMILY DECISION MAKEF"
S0 FOR T = 1 TO 1500:NEXT T
4 0 ~ C L S ~
50 FFINT "TYFE IN THE OFTIONS"
GO FFINT. "AND THE COMFUTER WILL DECIDE"
70 INFUT "WHAT IS OFTION #1":OIF
80 INFUT "WHAT IS OPTION #2":O2⿻三丨口丨
90 FFINT "I'M THINKING IT OVEFi......"
100 FOR T = 1 TO S000:NEXT T
110 C=FNND(2)
120 CLS
1ङ0 FFINT "MY CHOICE IS:"
140 IF C = 1 THEN FRINT O1车
150 IF C = 2 THEN FRINT O2%
```

In this program the computer makes its choice in line 110. Lines 90 and 100 are where the computer is，＂thinking it over＂．You probably noticed that the computer isn＇t really ＂thinking it over＂．It＇s actually counting up to E 000 ，then executing line 110 ．The choice is printed on the screen in lines $130-150$ ．

The VARIABLES are：
T＝time delay
C＝choice
O1末＝option \＃1
02事＝option \＃2

TFS -80

## Bonus Frogram \#S FEACTION TIMEF

Here is a program to test your reaction time. When the computer says "GO!", you must press the BFEAk Eey as quickly as you can. Compare your score with the chart in the program. Good luck!

10 CLS
20 FFINT "TEST YOUF FEACTION TIME"
30 FFINT "AGAINST THE COMFUTER:"
40 FFIINT "WHEN THE COMFUTEF SAYS GQ!'"
50 FRINT "FFEESS THE BREAK KEY"
60 FFINT "YOUF SCOFE IS THE HIGHEST NUMEEF YOU SEE"
70 FFINT:FKINT " $\emptyset 1-10=L I G H T N I N ' 10-2 \emptyset=Q U I C K!"$
80 FFINT "20- $30=A V E F A G E \quad 30-50=N A F F I N G "$
90 FFINT:FRINT:FFINT "FRESS ENTEF"
$10 \square$ FRINT "WHEN YOU AFE READY"
110 INFUT A
120 CLS:FFINT "ON YOUF MAFK"
130 FOR $T=1$ TO $1000:$ NEXT T:FRINT "GET SET!"
140 FOF $T=1$ TO FND (5000): NEXT T
150 CLS:FFINT "GO!"
160 FOR $T=1$ TO 50:FRINT T:NEXT T
170 FRINT "SOMEONE WAKE THIS FERSON UF!"
The VAFiIAELE, of the FOR/NEXT statement in line 140 , equals a FANDOM INTEGEF between one and five thousand. This causes the time delay to be different each time the program is $\mathrm{FUN}_{\mathrm{H}}$. When you press the EREAK key the computer will say, "Ereak in 160". This is normal for the program. your score is the highest number you see. Type fun and press ENTEF to play again.

TRS-80
Eonus Frogram \#4 M.F.G. RECORDEF
If you're like me, you never take the trouble to figure out your car's miles per gallon (M.F.G.). Even having a calculator handy has never helped, though there are only three basic numbers to calculate. This is one more instance in which wanting to use my computer motivates me to do the fairly simple task: I've managed to ignore. My mechanic tells me that I should check my M.F.G. after every five fill-ups. That way, if my M.F.G. starts dropping, I can take my car in for a checkup...before it's too late.

10 CLS
20 FFint "MPG CALCULATOR"
S0 FOR T = 1 TO 1500:NEXT T
40 CLS
50 FRINT "THIS IS A FROGRAM TO FIGURE OUT"
60 FRINT "THE MILES FER GALLON YOUR CAR GETS"
70 FRINT "HOW MANY MILES HAVE YOU DRIVEN"
80 FRINT "DURING THE FAST FIVE FILL-UPS"
90 INFUT M
100 FRINT "HOW MANY GALLONS OF GAS DID YOU USE"
110 FRINT "IN THE FAST FIVE FILL-UPS"
120 INFUT G
$130 \mathrm{MFG}=\mathrm{M} / \mathrm{G}$
140 FRINT "YOU HAVE EEEN GETTING "MFG
150 FRINT "MILES PER GALLON"
Notice that we used $G$ as the VAFIABLE for gas, $M$ as the VARIABLE for miles, and MF'G as the VARIABLE for miles per gallon. In line $1 \Xi 0, M F G=M / G$ means miles per gallon equals miles divided by gallons.

## Bonus Frogram \＃5 COUFON CALCULATOF

Computers are pretty good at solving problems and presenting the results in a manner which is easy to read． This program can be used to display the amount of money you will save with your shopping coupons．

## 10 CLS

20 FRINT＂COUFON CALCULATOF＂
3Ø FRINT：FRINT＂TO FIND OUT HOW MUCH YOU＇LL SAVE＂
40 FFIINT＂WITH YOUF SHOFFING COUFONS＂
50 PRINT＂ANSWEF THE FOLLOWING QUESTIONS＂
6® PFIINT＂THEN FFIESS THE ENTER KEY＂
7ロ PRINT：FRINT＂HOW MANY COUFONS DO YOU HAVE＂
80 INFUT C
90 PRINT：FRINT＂ENTER THE AMOUNT OF A COLFON＂
10ロ PRINT＂DON＇T USE A DOLLAR SIGN＂
110 FRINT＂DO USE A DECIMAL FOINT＂：FRINT
120 FOR $E=1$ TO $C:$ FRINT＂ENTER VALUE OF COLJFON \＃＂E
$1 \leq 0$ INFUT A
$140 T=T+A$
150 NEXT E
160 FRINT：FRINT＂丰＂T＂WILL EE SAVED＂

The VARIABLES in this program are：
C＝number of coupons
E＝coupon\＃
$A=$ value of coupons
$T=$ total value of coupons

Line 140 adds up the total，each time a value is entered into the computer．Line 160 prints the total value to be saved．

TRS-80
Bonus Program \#6 SFOFTS FORECASTER
The SPORTS FORECASTER can be a handy program if you enjoy sports. This program will take a team's current record and project, based on winning percentage, what the team's record will be at the end of the season.

10 CLS
20 FRINT "SFORTS FORECASTEF"
30 FOR Z = 1 TO 1500:NEXT Z:PRINT
40 PRINT "THIS PROGRAM WILL FORECAST A TEAM'S"
50 PRINT "FINAL WIN AND LOSS RECORD"
60 FRINT "BASED ON ITS CURFENT FECORD"
70 FRINT:PRINT "ANSWER EACH QUESTION"
80 PRINT "THEN PRESS ENTER"
90 PRINT:PRINT "HOW MANY GAMES DOES THE TEAM PLAY"
100 INFUT T
110 FRINT:FRINT"HOW MANY WINS DO THEY HAVE NOW"
120 INPUT W
130 PFint "How many losses do they have now"
140 INPUT L
$150 \mathrm{P}=\mathrm{W} /(W+L): Y=T * F \cdot \mathrm{D}=\mathrm{T}-\mathrm{Y}$
160 PRINT:FRINT "END OF THE SEASON PROJECTION:"
170 PRINT:FRINT "WINS="INT (Y)"LOSSES="INT (D) +1
The VARIABLES are:
$\mathrm{Z}=\mathrm{time}$ delay variable
T=total games in season
W=games won
L=games lost
F=percentage of games won
$Y=e n d$ of year games projected won
$\mathrm{D}=$ end of year games projected lost
The forecast is completed in line 150 when the winning percentage ( $F$ ) is established by dividing the number of completed games ( $W+L$ ) into the total games won so far (W). The total wins for the year is estimated by multiplying the amount of games in the season ( $T$ ) by the winning percentage (F). The year end losses are determined by subtracting the end of year projected games won ( $Y$ ) from the total games in the season ( $T$ ).

## Eonus Frogram \#7 SHOWEF MONITOF

Getting into the shower, day after day, and finding cold water can be a drag. I'm sure that large families know what I'm talking about. Bonus Frogram \#7 has been designed to whip, morning bathroom confusion. It's called the SHOWER MONITOR. You type in the names and the computer picks the shower order.

10 CLS
20 PRINT "SHOWER MONITOR"
30 FOR T= 1 TO 2000:NEXT T:CLS
40 PRINT "THIS PROGRAM IS DESIGNED TO HELF"
50 FRINT "FAMILIES DECIDE, IN A FAIR WAY"
60 FRINT "THE ORDEF IN WHICH THE SHOWEF IS USED"
70 PRINT "IN THE MORNING."
80 FRINT:PRINT "EACH PERSON'S NAME IS TYFED INTO THE"
90 PRINT "COMFUTER. THEN THE COMFUTER RANDOMLY"
100 FRINT "CHOOSES THE ORDER (AS IF OUT OF A HAT)."
110 PRINT "TYFE EACH ANSWER, THEN FRESS ENTER."
120 FFiINT:FRINT "HOW MANY PEDPLE IN YOUF FAMILY"
130 INPUT $F$
140 FRINT:FRINT "TYFE IN THE NAMES, ONE AT A TIME."
150 FRINT "THEN FRESS ENTER."
160 FOF $H=1$ TO F
170 INPUT $\mathrm{N}=(\mathrm{H})$
180 NEXT H
190 CLS:PRINT "THIS IS THE SHOWER ORDEF TODAY:"
200 PRINT:FOR $R=1$ TO $P$
$210 \mathrm{X}=\mathrm{RND}(\mathrm{F})$
220 IF $N \neq(X)="$ "THEN 210
230 PRINT N $\$(X)$
$240 \mathrm{~N}=(\mathrm{X})="$ "
250 NEXT R
260 GOTO 260
The VARIABLES are:
P=number of people in family
H=array parking lot\#
$X=r$ andom number
$N \neq(X)=$ name of person $X$ in array
$\mathrm{R}=$ counting variable
You are probably wondering what an Afifity is. An ARRAY is a computer parking lot. In an ARFiAY you don't park cars. Rather, you park words and numbers. In this program we parked the name of each person in an ARRAY location (such as $N \neq(1)=$ Mom", $N \neq(2)=$ "Larry", $N \neq(3)=" R i c k "$, etc). The names are loaded into the ARRAY in lines $160-180$. The RANDOM shower order is determined in lines 200-250. Can you figure out why a name isn't picked more than once?

Eonus Frogram \＃8 NUMEEFi GAME FOF TWO
Computers are great for playing games．They can be programmed to make games，both unpredictable and exciting． Here is a super game for two people．The computer＂pullsa number out of its hat＂，and the players take turns trying to guess the number．The player with the most correct guesses， after seven rounds，is the champ．Switch sides after seven rounds．You will be surprised at the strategies involved．

10 CLS
20．FFINT＂THIS IS A NUMEEF GAME FOF TWO FEOFLE＂
ロ FRINT＂THE COMFUTEF FICKS A NUMEEF BETWEEN 1 AND SDO．＂
40 FFINT＂THE FLAYEFS TAKE TUFNS GUESSING THE NUMEEF＂
50 FRINT＂UNTIL SDMEDNE GUESSES THE NUMEEF＂
6Ø FFFINT＂THE FLLAYEFI GUESSING THE MOST NUMEEFS，＂
70 FFINT＂AFTEF 7 ROUNDS，IS THE WINNEF＂
80 FFINT ：INFUT＂WHAT IS FLAYEF \＃1＇S NAME＂；F＇1末
90 FRINT：INFUT＂WHAT IS FLAYEF \＃2＇S NAME＂：F2t
$100 \mathrm{Fi}=\mathrm{Fi}+1: N=\mathrm{FiND}(50 \square)$
110 IF F $\quad 1$ THEN FFINT＂THE SCOFE IS＂Fi申＂＝＂F1＂＂F2も＂＝＂F2
120 FOF $T=1$ TO 25ดO：NEXT T
13 IF $F>7$ THEN 260
$140 \mathrm{FOF} \mathrm{T}=1 \mathrm{TO} 1$ ODO：NEXT $T$
150 CLS：FFINT＂FOUND＂F＂，＂F＇i⿻三丨＂＇S TUFN＂
16OFFINT：INFUT＂WHAT IS YOUR GUESS＂：G1
170 IF G1 \＆N THEN FFITNT＂TOD LOW，＂F1丰：GOTO 2DD
180 IF G1 $>N$ THEN FRINT＂TOU HIGH＂：GO TO 20ロ
190 FFIINT＂YOU GOT IT＂FI末：F1＝F＇1＋1：GOTO 1』0
200 FOF $T=1$ TO 1000：NEXT T
210 CLS：FFINT＂FOUND＂F＂，＂F2末＂＇S TUFN＂
220 FFINT：INFUT＂WHAT IS YOUF GUESS＂：G2
2ऽØ IF G2＜N THEN FFINT＂TOO LOW＂：GOTO 140
240 IF G2 $>\mathrm{N}$ THEN FRINT＂TOO HIGH＂：GOTO 140
250 FFiINT＂YOU GOT IT＂F2＂业：2＝F2＋1：GOTO 100
260 CLS：FOF T＝ 1 TO 1ロロ0：NEXT T
270 IF F＇1 $>$ F2 THEN FFINT Fi丰＂CFEAMED＂F2丰＂＂Fi＂TO＂FW：END 280 FFFINT F＇2丰＂WASTED＂F1丰＂＂F2＂TD＂F1

The VAFIABLES are：
F1本＝player \＃1
F2丰＝player \＃2
F1＝player \＃1 score
F2＝player \＃2 score
G1＝player \＃1 guess
G2＝player \＃2 guess
Fi＝round\＃
T＝time delay variable
$N=s e c r e t$ number
The secret number（N）is picked in line 100. To alter the limits of the secret number，you can change the 500 to a larger or smaller number．Try $100 \oslash 0$, for instance．In several places you may notice symbols like this： 3 or this：\＆The symbol $>$ mears＂greater than＂and $<$ means＂less than＂．Can you make this game work with four players？

TFS $\mathbf{S O}$
Bonus Frogram \＃9 FRACTICAL JOKEF
Are you ready for some laughs？If so，Bonus Frogram \＃9 is the one for you．It＇s called the FRACTICAL JOKE PROGRAM． Here＇s how it works：

You type the program into your computer while the victim isn＇t around．RUN the program．The computer will ask you questions about the victim．You answer all the questions until the computer says，＂PRESS ANY KEY TO START THE JOKE＂． Press a key and the joke is ready for the victim．When the victim comes back，the computer will seem to know all about him／her．Just say that you＇re hooked up to the MASTEF COMPUTER，and it knows EVERYTHING！！！

10 CLS
20 FRINT＂FRACTICAL JOKE FROGRAM＂
30 FOR $T=1$ TO 1000：NEXT T
40 CLS
50 INPUT＂WHAT IS THE VICTIM＇S NAME＂；N
60 INPUT＂IS THE VICTIM MALE OR FEMALE＂；MF $\$$
70 IF MF $\$=$ MALE＂OR MF $\$=$＂M＂THEN G $\$=$＂HE＂：P $\$=$＂HIS＂
80 IF MF $=$＝＂FEMALE＂OR MF $=$＝＂F＂THEN G $=$＝＂SHE＂：F $=$＝＂HER＂
90 PRINT＂WHAT CITY IS＂G末＂FROM？＂：INFUT C
100 PRINT＂HOW OLD IS＂G＊＂NOW？＂：INFUT A
110 FRINT＂WHAT IS＂F末＂FAVORITE HOBEY＂：INFUT H末
120 FRINT＂WHAT IS＂F末＂NICKNAME＂：INPUT NN
130 FRINT＂FRESS ANY KEY TO START THE JOKE．＂
140 S $\$=$ INKEY $\$$ ：IF S $\$=$＂THEN 140
150 CLS
160 FRINT＂FRESS A KEY AND I WILL TALK TO．YOU＂
170 S $=$ INKEY $\$$ ：IF $5 \$="$ THEN 170
180 PRINT＂HELLO，LET ME TF＇Y TO GUESS YOUR NAME．＂
190 PRINT＂I＇M THINKING．．．＂
200 GOSUB 400
210 PRINT＂YOU LOOK LIKE SOME TYPE OF＂N＊：GOSUB400
220 PRINT＂BUT I HOPE YOU WON＇T MIND IF I CALL YOU＂
230 FRINT NN $\$:$ GOSUB400
240．PRINT＂THE TOUCH OF YOUR FINGERS＂：PRINT
250 FRINT＂LEADS ME TO BELIEVE YOU ARE AT LEAST＂：FRINT
260 FRINT A＂YEARS OLD＂：GOSUB40』
270 FRINT＂AND YOU SMELL LIKE A FERSON FROM＂：FRINT
280 PRINT C ：：GOSUB40®
290 FFiNT＂THE CENTRAL COMFUTEF TELLS ME YOU LIKE：＂：PRINT
300 PRINT H\＄：GOSUB400
310 FRINT＂NOW，IT＇S YOUR TURN TO ASK ME A QUESTION＂
320 INFUT＂TYFE YOUR QUESTION，THEN FRESS ENTER＂：Q
330 GOSUB400
340 PRINT＂SORFY，＂NN末＂THAT＇S TOD FEFSONAL！＂
350 PRINT＂YOUR ACCESS TO THE MASTER COMPUTER HAS＂．
360 PRINT＂BEEN TERMINATED UNTIL 1999＂：END
400 FOR T＝ 1 TO 4000：NEXTT：CLS：RETURN
continued on next page．．．．

TRS-80

In the FFiACTICAL JOKE program you are introduced to some new commands. Two are called GOSUB and RETUFN (not the key). GOSUB 400 means, "goto the subroutine at 400". A SUBFOUTINE is like a program, within a program. RETUFN means "return to the main program". A SUBROUTINE always starts with GOSUB and ends with FETURN. This SUEFOUTINE, line 400 , causes a time delay and clears the screen. In lines 140 and 170 is another, new command, called INKEY. INKEY tells the computer to wait for a key to be pressed. In line 140, if no key is pressed, the computer waits at line 140. When a key is pressed, the program proceeds on to line 150.

VAFIAELES are:
T=time delay
N: =victim's name
MF $=$ =male or female
Gi=he or she
C $=$ =city
$A=$ age
$\mathrm{H}=$ =hobby
NN: $=$ nickname
F' $==$ his or her
Q 0 =question
S末=inkeyま

## TFS－80

Eonus Frogram \＃10 NATH SHAFFENEF
This program is called MATH SHAFFENEF：I ve been saving this program for the whiz kids．You must be one，or you wouldn＇t be reading this．The MATH SHAFFENEF has been designed to quiz both the beginner and the advanced on basic math sticils．Don＇t use a soratch pad and I assure you， you＇ll get a worl：out．You will receive instructions when you FUN the program．

10 FEM $* * *$ MATH SHAFIFENEFi＊＊＊
2ロ $5=\square: C L S$
ED FFINT＂THIS IS A FFOGFAM TO SHAFFEN YOUF MATH＂
40 FFFINT
5Ø FFIINT＂FICド井：1）EASY 2）HAFD，THEN ENTEF＂
6D INFUT L
70 FFINT＂THE SYMEOLS AFE：＂
80 FFINT＂＋ADD－SUETFAACT＂
90 FFIINT＂＊MLLLTIFLY／DIVIDE＂：FFiINT
100 FRINT＂EXANFLES：＂
110 FFINT＂2＋3＝5 $\quad 8-4=4 "$
120 FFINT＂2＊4＝8 $\quad 918=3 " F F I N T$
1 Ø FRINT＂FICド THE NUMEEF OF THE FUNCTION＂
140 FRINT＂YOU WANT TO FFACTICE：＂FFINT
150 FFINT＂1）ADD＂
160 FFINT＂2）SUETFACT＂
170 FFINT＂${ }^{\prime \prime}$ ）MULTIFLKY ${ }^{\prime \prime}$
180 FRINT＂4）DIVIDE＂
190 INFUT D
2ロロ CLS：FFFINT＂TYFE THE NUMEEF OF QUESTIONS＂
210 INFUT＂YOU WANT，THEN FRESS ENTEF＂：Q
$220 \mathrm{FOF} T=1 \mathrm{TO} 0$
2تØ FFINT＂ANSWEF THE FFOBLEM，THEN FFESS ENTEF＂：FFITNT
240 IF $L=1$ THEN $A=F N D(10): B=F N D(10)$
250 IF $L=2$ THEN $A=F W N D(200): E=F N D$（200）
260 IF $D=2$ AND A $B$ THEN 240
$27 \square$ IF $D=4$ AND $A=\square \quad \square F \quad E=\square$ THEN 240
280 IF $D=4$ AND A $\mathrm{A} E$ THEN 240
290 IF $D=4$ AND $A / E$ \＆INT（A／E）THEN240
$30 \square$ IF $A=E$ DF $E=1$ THEN 240
$\Xi 10$ IF $D=1$ THEN FFINT $A^{\prime \prime}+" E "=" ;$ INFUTC
Z20 IF D $=2$ THEN FFINT A＂－＂B＂＝＂：INFUTC
$\because \mathbb{B C}$ IF $D=3$ AND $L=1$ THEN FFINT A＂＊＂E＂＝＂：INFUT C
$\leq 40$ IF $D=\Xi$ AND L $=2$ THEN FRINT INT（A／S）＂＊＂INT（E／E）＂＝＂：INFUTC
$\Xi 5 \square$ IF $D=4$ THEN FFINT $A^{\prime \prime} / " E "=":$ INFUTC
continued on next page．．．

## TRS-80

```
360 IF D=1 AND C=A+B THEN S=S+1:PRINT "ALRIGHT!":GOTO490
370 IF D=2 AND C=A-B THEN S=S+1: FRINT"RIGHT ON!":GOTO490
380 IF D=S AND L=1 AND C=A*E THEN S=S+1:Z=1
390 IF Z=1 THEN FRINT "COFRECT!": Z=0:GOTO490
400 IF D=S AND L=2 AND C=INT (A/5)*INT (B/5) THEN S=S+1:Z=2
410 IF Z=2 THEN FFINT "GREAT!": Z=0:GOTO490
420 IF D=4 AND C=A/E THEN S=S+1:FRINT"YOWSAH!":GOTO490
430 FRINT"YOU GOOFED. THE ANSWER WAS:";
440 IF D=1 THEN FRIINT A+B
450 IF D=2 THEN FRINT A-B
460 IF D=3 AND L=1 THEN FFINT A*E
470 IF D=S AND L=2 THEN FRINT INT(A/5)*INT(B/5)
480 IF D=4 THEN FFINT A/B
490 FOR W=1TO800:NEXT W:CLS:NEXT T
500 PFINT"YOUR SCOFE IS: "S" OUT OF "Q" RIGHT!"
5 1 0 ~ F R I N T " P R E S S ~ A N Y ~ K E Y ~ T O ~ C O N T I N U E " ~
520 A =INKEY$:IF A*=""THEN 520
5.30 GOTO 10
```

The VAFiIAELES are:
L=easy/hard
$D=f$ unction to practice
Q=\# वf questions
$T=q u e s t i o n ~ l o o p$
$A=r$ andom number 1
$\mathrm{E}=\mathrm{r}$ andom number 2
C=choice (your answer)
W=delay
S=score
A末=get variable
$Z=c o r r e c t ~ m u l t i p l i c a t i o n ~ f l a g ~$

If you have problems getting this program to work properly, double check lines 240-50Ø. These are the lines where most of the mathematical processing takes place. In this section, if $D=1$, then you are adding; if $D=2$, you are subtracting; $D=3$, means multiplying; and $D=4$ signifies division. If $L=1$, then the quizzes are easy. If $L=2$, then the quizzes are hard. Should you have the desire to make the program more difficult, you can increase the FiANDOM NUMEERS, in lines 240-250.


