

Download and Extract

An initial setup of files is provided to you via a shell script: [Download potd-q41](#)

Using a terminal, extract the initial files by running the shell script you just downloaded (you will need to navigate to the directory where you saved the file):

```
sh potd-q41.sh
```

Your files for this problem will be in the `potd-q41` directory.

The Problem

Task 1: Implement the Bernstein hash function

Today, we'll construct a more sophisticated hash function, called the Bernstein hash. For a string `str`, the Bernstein hash, `b_hash`, is computed by iterating over its characters. The pseudo-code is as shown below:

```
b_hash = 5381
for all character in str:
    b_hash *= 33 + character //use the ASCII value of the character here
```

The magic number 33 is used simply because it works! Why it works better than many other constants, prime or not, has never been adequately explained. Your task is to write a function `unsigned long int bernstein(string str)` that takes in a string as an input and returns its hash. Notice how quickly the hash grows with the length of the input string.

Task 2: Effect of character ordering on the Bernstein hash

We'll now test the hash function with various inputs. Recall that the additive hash (the one you implemented in the last POTD) is invariant to the ordering of the letters in a string. Thus, POTS and STOP have the same additive hash. This is usually not desirable. We'd first like to see if the Bernstein hash function is sensitive to the ordering of characters. To do so, we'll compare the hashes of a string and its reverse. Write a function `reverse()` to invert a string, and check if the Bernstein hash for a string changes if the string is inverted.

Example Output:

```
Bernstein hash of POTS with range 13 is: 6
Bernstein hash of the reverse of POTS - STOP - with range 13, is: 7
```

Compile and Test

A complete Makefile and a `main.cpp` file containing one simple test has been provided for you. To compile and run, run:

```
make
./main
```

Upload Solution

Drop files here or click to upload.

Only the files listed below will be accepted—others will be ignored.

POTD 41

Total points: 0/1

Score: 0%

Question

Value: 1

History:

Awarded points: 0/1

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Files

Hash.cpp
not uploaded

Hash.h
not uploaded

Save & Grade

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