Coin Change?

Problem Submissions Leaderboard Discussions

As a cashier, you often need to make change. But this is kind of a mindless activity (the computer tells you the best way to make change for a given amount), so you get bored. One day, you start to wonder how many ways you could make change for a particular amount.

A "way of making change" is a sequence C_1, C_2, ..., C_N, where C_i identifies the ith coin type given to the customer. Note that, for example, giving the customer a nickel followed by a dime is different than giving the customer a dime followed by a nickel: **order matters**! Note also that coin types can be repeated. So, to make 25 cents in change, you could give the customer five pennies, then a dime, and finally two nickels.

You have an unlimited number of pennies (1 cent), nickels (5 cents), dimes (10 cents), and quarters (25 cents). Given an amount X (in cents), how many ways are there to make change for that amount? **Since your answer may be large, print the remainder when your answer is divided by $10^9 + 7$.**

Hint:

Be careful when using the modulo operator! At every step of your computation, try to keep all your numbers reduced modulo $10^9 + 7$.

Note that $(a + b)\%M = ((a\%M) + (b\%M))\%M$, and $(a * b)\%M = ((a\%M) * (b\%M))\%M$.

Grading

Correctness & Efficiency: 80%

- Passes 43 test cases: 80%
- Passes 30 to 42 test cases: 60%
- Passes 20 to 29 test cases: 40%
- Passes 1 to 19 test cases: 20%
- Passes 0 test cases: 0%

Code Quality: 20%

Input Format

Each test case consists of a single line of input containing a single integer, X, the amount (in cents) for which you want to make change.

Constraints

$0 \leq X \leq 100,000$

Output Format

For each test case, print a single line of output containing the number of ways to make change for X. Since your answer may be large, print it modulo 10^9 + 7.

Sample Input 0

```
1
```

Sample Output 0

```
1
```

Explanation 0

There is only one way to make change for 1 cent: a single penny.

Sample Input 1

```
4
```

Sample Output 1

```
1
```

Explanation 1

There is only one way to make change for 4 cents: four pennies.

Sample Input 2

```
10
```

Sample Output 2

```
9
```

Explanation 2

There are nine ways to make change for 10 cents: a dime; two nickels; ten pennies; or any of the 6 orderings of a nickel and five pennies.

```cpp
#include <cmath>
#include <cstdio>
#include <vector>
#include <iostream>
#include <algorithm>
using namespace std;


int main() {
    /* Enter your code here. Read input from STDIN. Print output to STDOUT */
    return 0;
}

```

Line: 1 Col: 1

Upload Code as File Test against custom input Run Code Submit Code