Homework Assignment 1

Due Date: 18:30, March 10, 2016

1 Problem 1

Write a simple program to compute expression in postfix notation and output the result. You may use `std::stack` to implement the program. You only need to support elementary arithmetic of integers in this problem. All intergers will be in the range of -2^{31} and $2^{31} - 1$.

1.1 Input

The input is an expression in postfix notation. Literals in the input follow a character `i`.

1.2 Output

Output the value of the expression.

1.3 Sample Input

i 10 i 1 + i 4 * i 7 /

1.4 Sample Output

6

2 Problem 2

Template metaprogramming is a powerful technique to compute constant expression at compile-time. In this problem, you need to complete `p2.hpp` to compute Fibonacci numbers at compile-time. **Please note that TA will use another main.cpp to grade your code so any hardcoded return value is a bad idea.** Also, you may revise `main.cpp` to test the implementation.

`main.cpp`

```
#include <iostream>
#include <cstdint>
#include "p2.hpp"

int main(){

        constexpr uintmax_t N = 10;

        // It should output 55.
        std::cout << "fib(" << N << ") = "
                  << problem2::Fib<N>::Value << std::endl;

        return 0;

        }
```

`p2.hpp`

```
#include <cstdint>

namespace problem2{

        template<uintmax_t N>
        struct Fib{

                // Change this line
                constexpr static uintmax_t Value = 0;

                static_assert(Fib<N>::Value >= Fib<N-1>::Value,
                              "Overflow!");

                };

        // Fill code here

        }
```

3 How to submit the assignment?

1. Name the source code of each problem as following:
   - Problem 1: p1.cpp
   - Problem 2: p2.hpp
2. Do not rename the files or put them into any directory. Upload them directly to the **e-Campus (E3)** system. You will get no credit if you don't follow the rule. Note that the penalty for late homework is **15% per day**, and late homework will not be accepted after 3 days past the due date. In addition, homework assignments must be individual work. If I detect what I consider to be intentional plagiarism in any assignment, the assignment will receive **zero credit.**