Programming Assignment #1 (due 23:59:59 10/10, 2014)

Course Website: http://54.68.45.250/~ec2-user/index.html

Problem: Prime Checker

RSA is one of the first practicable public-key cryptosystems and is widely used for secure data transmission. In such cryptosystems, primes play an important role. Hence, how to efficiently separate the primes from the composite numbers is a critical job in today's internet world.

In this assignment, you need to implement a function called the prime checker, which turns whether the input integer is a prime or not, by using C++.

Provided files: (1) main.cpp, (2) PrimeChecker.cpp, (3) PrimeChecker.h, (4) example

- **main.cpp** – it checks the answer of **PrimeChecker** and can be changed if necessary for you to debug.

```
int main(){
    //input file
    …
    //end input file
    //check
    while(input stream a number){
        total_num++;
        if( call PrimeChecker and check its answer ){ correct++; }
    }
    //end check
    cout<< correct/total_num << endl;
    cout<< runtime <<endl;
}
```

- **PrimeChecker.cpp, PrimeChecker.h** – it's the program file you need to implement. In these two files, it includes the targeted function **bool PrimeChecker(int);**
  The function **PrimeChecker** receives an integer, and turn 1 if the received integer is a prime and 0 if otherwise.

- **example** – it is an exemplary input test case, which can be used to test your program. You can modify the file for the use of debug.

A partial content of **example** is shown below:

Number	IsPrime
4046299	1
2336	0
100400	0
5139917	1
…	…

The numbers on the left are the input integers of the function **PrimeChecker**, and the numbers on the right are the golden answers of the returned value of the function **PrimeCheck()**, which will then be used in **main()** to compare the correctness of the function **PrimeChecker()**.
Note that the minimum and maximum of the input number is 2 and 2147483647 respectively. (2147483647 is the maximum number of signed integer in UNIX/Linux).

Platform
You may develop your software on UNIX/Linux.
Compile: $ g++ main.cpp PrimeChecker.cpp
Execution: $ ./a.out

Submission
Please update the following materials to **online judge system** on the course website by the deadline, specifying your account and check the leader board.

(1) PrimeChecker.h
(2) PrimeChecker.cpp

Grading

(1) example correct: 40%
(2) 100% accuracy: 20%
(3) leader board ranking: 20% (ranking priority: accuracy > run time)
(4) hidden cases ranking: 20% (ranking priority: accuracy > run time)