

Java for Non Majors

CGS 3416: Fall 2019

Department of Computer Science, Florida State University

Homework 3: 100 points

Due date: 11:59 PM 10/04/2019

1 Objective

The objective for this assignment is to familiarize yourself with the way loops and selection statements work in Java. For this assignment, you're required to turn in two programs that involve loops on different levels. These programs don't require an IDE and are meant to be compiled on the terminal.

Please submit your files "`Primes.java`" and "`Powers.java`" to canvas

2 Program 1

This program is called "Powers.java".

Write a program to print all the powers of 2 below a certain number and calculate their sum . Make sure your program conforms to the following requirements:

1. Accept the upper limit from the user (as an integer).
2. These numbers grow very fast. Make sure the sum variable is of the "long" type. You can assume that the test output will be less than `LONG.MAX`.
3. Print all the numbers as a running sum, and finally print their sum. The input and output should match the sample run perfectly.

2.1 Sample Runs

There are 2 sample runs here.

Enter the upper limit: 500

`1 + 2 + 4 + 8 + 16 + 32 + 64 + 128 + 256 = 511`

Enter the upper limit: 1055

`1 + 2 + 4 + 8 + 16 + 32 + 64 + 128 + 256 + 512 + 1024 = 2047`

3 Program 2

This program is called "Primes.java".

Write a program to print all the prime numbers below a certain given number. A prime number is defined as a number that can only be divided by 1 and itself. For example, 2, 3, 17 and 41 are all prime numbers. Make sure your program conforms to the following requirements:

1. Accept the upper limit from the user (as an integer).
2. You can assume the user input will be positive and smaller than INT_MAX.
3. Go from 1 to the number. If you happen to find a number that is prime, print it. The input and output should match the sample run perfectly.

3.1 Sample Runs

There are 2 sample runs here.

Enter the upper limit: 25

The prime numbers are:

2, 3, 5, 7, 11, 13, 17, 19, 23

Enter the upper limit: 70

The prime numbers are:

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67

4 Generic Grading Guidelines

1. Please make sure you're only using the concepts already discussed in class. That is, please try and restrict yourself to loops, selection statements and calls to library methods, if necessary.
2. The first program is worth 40 points, the second is worth 60 points.
3. You need not perform any form of error checks.
4. Please make sure that you're conforming to specifications (program name, print statements, expected inputs and outputs etc.).
5. Please make sure your code is readable.
6. Please make sure you've compiled and run your program before you turn it in. Compilation errors can be quite costly.