CSE108 – Computer Programming Lab

Week #4

Due Date: 13/03/2020

Part 1. Assume that you are given a text file named "integers.txt" which has at least 30 lines and at each line at least 20 numbers separated by a space. Write a function that takes two integers as arguments "i" and "j". This function reads total of "i" lines from the file and at each line "j" numbers. It averages the sum of all these numbers and returns it. Your program should check if "i" and "j" are less than or equal to 30 and 20 respectively. (20 pts)

Part 2. [35pts] Write a complete program that reads two integer numbers from the user and calls the following function:

```
void generate_primes(int n1, int n2, int *nump, int *numsemp);
```

This will take the given two numbers n1 and n2 and find all the primes and semi-primes in between (both ends are included). A semi-prime number is a number that have only two prime divisors. The function will return two numbers:

nump: the number of primes found,

numsemp: the number of semi primes found

Your program will output these two numbers as well.

For example, if the user enters 2 and 10, your program should output the following:

```
2 is Prime
3 is Prime
4 is Semi-prime
5 is Prime
6 is  Semi-prime
7 is  Prime
9 is  Semi-prime
10 is Semi-prime
Num primes: 2
Num semi-primes: 1
```

You are encouraged to write helper functions to find if the number is prime or a semi-prime.

Part 3. You will take an integer from user. You will design a loop that performs the following. At each step: check whether the given integer is even or odd. If the integer is even then you will divide it by two, else you will multiply it by three and add one. Furthermore, you will calculate both number of primes and number of relative primes to that integer at each step. You will print current step, integer, number of primes and relative primes and restart the loop. Your loop will stop after when the calculated value becomes 1.(45 pts)

Ex:

Step	Value	No of Primes	No of co-Primes
1	3	1	1
2	10	4	3
3	16	6	15
4	5	3	2
	.....		
		.....	
N	1	0	0