Fall 2015

BBM 103: Introduction to Programming Laboratory I

PROGRAMMING ASSIGNMENT 2

Subject: Printing shapes by using asterisks,

Finding Prime Numbers & Calculating combination of two numbers

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Due Date: 05.11.2015

Part I: Printing shapes by using asterisks

In this part, you will develop an application which supports the following operations;

1. Printing a square by using asterisks, depending on row number
2. Printing a rectangle by using asterisks, depending on row and column number
3. Printing a triangle by using asterisks, depending on row number

Also, application must wait input from user until user enters 'E' character.
The example below shows the outputs and input commands which define a square with 3 rows, a rectangle with 5 rows and 11 columns, a triangle with 4 rows.

```
S 3
***
***
***
R 5 11
***********
***********
***********
***********
***********
T U 4
*
**
***
****
E
```

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Part II: Finding Prime Numbers & Calculating combination of two numbers

Two problems that you should solve are as follows:

1. Finding Prime Numbers
2. Calculating combination of two numbers.

At the start of your program, a menu will be displayed to the user. The user will make a selection and the program will do the selected operation.

Program Operations

1. **Prime numbers**: A natural number (i.e. 1, 2, 3, 4, 5, 6, etc.) is called a prime or a prime number if it has exactly two positive divisors, 1 and the number itself. Among the numbers 1 to 6, the numbers 2, 3, and 5 are the prime numbers, while 1, 4, and 6 are not prime.

Your program should find the prime numbers till n value given by user. For example, say n=40, prime numbers are: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37.

2. **Combinations:** Your program should calculate Combinations according to user inputs, n and r are the input values.

$$\boldsymbol{C(n,r)} = \binom{\boldsymbol{n}}{\boldsymbol{r}} = \frac{\boldsymbol{n}!}{\boldsymbol{r}!(\boldsymbol{n}-\boldsymbol{r})!}$$

3. Press E for Exit. If E key is pressed by the user, program will exit. Your program should run until exit option is selected. After each calculation, program should turn back to the initial menu.

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Notes

- Do not miss the deadline.
- Save all your work until the assignment is graded.
- The assignment must be original, individual work. Duplicate or very similar assignments are both going to be considered as cheating.
- You can ask your questions via Piazza (https://piazza.com/hacettepe.edu.tr/fall2015/bbm103) and you are supposed to be aware of everything discussed in Piazza.
- You will submit your work from https://submit.cs.hacettepe.edu.tr/index.php with the file hierarchy as below:

This file hierarchy must be zipped before submitted (Not .rar, only .zip files are supported by the system)

→ <student id>
  → part1.py
  → part2.py

This file hierarchy must be zipped before submitted (Not .rar , only .zip files are supported by the system).