GEDIZUNIVERSITY

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Faculty of Engineering and Architecture

Computer Engineering Department

COM 101 – INTRODUCTION TO PROGRAMMING

Homework #4

Academic Year :   Fall 2015-2016
Due Date : December 18, 2015 hr.   5pm (Thursday)
Course Instructor : Inst. Gökhan Akyol
Course Assistants : Res.Asst. Arzum Karataş & Res. Asst. Feyza Galip

Question 1: (35 points)

Generate Frequency Bar chart :

Write a C program that calculates the frequencies of **an array** (it does not have to be same as seen in the sample output) elements, then prints the frequencies in form of bar chart as in the seen following figure.

Note that the **array** is **passed** a **function** that performs the task, and it must perform any integer array.

Sample Output:
```
*************************FREQUENCYMETER**********************
************************************************************************
Array elements = { 19,5, 13, 15, 5,7, 11, 19, 13, 5, 17, 5, 7, 11,13,13,5,11}
```

Value	Frequency	Bar chart
19	2	**
5	5	*****
13	4	****
15	1	*
7	2	**
11	3	***
19	2	**
17	1	*

Question 2: (25 points)

Write a C program that calculates n mod m without using mod operator(%). You are supposed to solve this problem by using a **recursive** function. **Note that** the n is the number and m is the modular base and they are passed to function as parameters.

Question 3: (40 points)

Write a C program to sort an array by following the steps.
- Assume that the array is imaginary(not really) divided into two parts as sorted and unsorted parts.
- Initially, sorted part is empty(because sort operation is not started yet) and unsorted part contains whole array elements.
- At each step, find minimum in the unsorted part and add it to the end of the sorted part.
- If the unsorted part is empty, stop. Otherwise, continue to just previous step (finding minimum and replace it correctly) up to unsorted part is empty.

Example: Sort {7, 4, 5, 9, 8, 2, 1}

You can see an illustrative example below to understand how the algorithm works Blue boxes represents the unsorted part while red ones sorted part. Arrows shows the replacement.
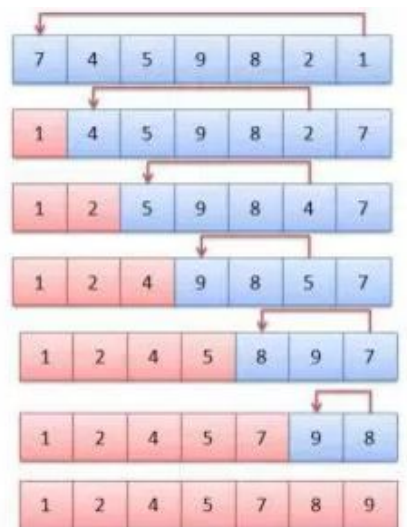
P.S.:

1. You are required to work alone. Teamwork is NOT allowed. Copy detection will done and it is punished strictly.

2. In your codes, you are expected to use good programming practices like naming conventions, indentations and comments. They will be graded, too.

3. Put your homework projects into **a** zipped folder(.zip or .rar are accepted). Do NOT send separate zip file for each question. Use the following convention for this folder.

    COM101_HmwX_StudentName.zip
    Ex: COM101_Hmw4_AliceBlack.zip

4. You should submit your homework to **gedizcom101lab@gmail.com**

5. Late submissions will be graded by using the formula $100 - 10*d^2$ where d is the number of late submission days.