Object oriented programming (BS-SE, Morning + Afternoon) 18-9-2020

Total marks: 25 marks (5x5)

Instructions:

- **No compensation or makeup lab**
- **Don't discuss with peers.**
- **Cheating cases will be given ZERO.**
- **You can ask relevant queries from TAs only between 9 am – 12pm.**
- **However, you can submit the lab solution to TAs before 6pm (same day).**

Lab 1: Practice of PF concepts with multi-file programs

Task 1:

You are required to design a Calculator. Take two numbers a and b as an input from the user. You need to implement the following functions.
Assume that for functions 1-7, you hired clientA to implement the functions. The clientsA will provide the implementation in a header file named *clientA.h*. Fors function 8-10, you hired clientB to implement the functions. The clientsB will provide the implementation in a header file named *clientB.h*.

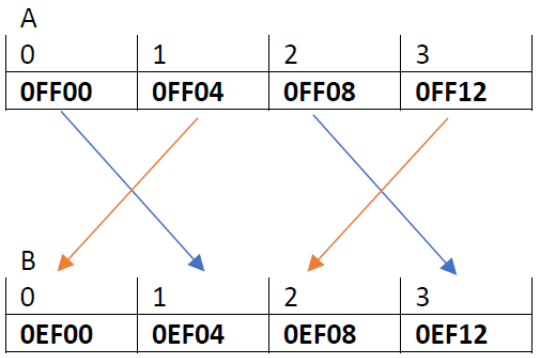
1. double Add(double a, double b); ***a+b***
2. double Subtract(double a, double b); ***a-b***
3. double Divide(double a, double b; ***a/b***
4. double Multiply(double a, double b); ***a*b***
5. double takeMod(int a, int b); ***a%b or a mod b***
6. double takePower(double a, double b); a_b
7. double takeSquareRoot(double a); √***a***
8. double takeSin(double a); ***sin(a)***
9. double takecos(double a); cos(a)
10. double taketan(double a); ***tan(a)***

Take input of two numbers in main() and then ask the user which function he wants to call. Keep running the logic till the user enters a character other than 'y'. You can take input from the user in character for this purpose. Include relevant header files/ library files.

Task 2:

In main(), call the function defined in separate **library file (.cpp).** The file will have a function to create a link between two memory locations as explained below.

Write a logic that declares an array of pointers with size as shown below. Print the address of location of cells of an array. Pls note that contents of this array would not be integer values, instead there will be addresses. Create an array of pointers to pointers (A) to create a following link between them. You can create a link / point locations to each other by using pointers concept. That is, A[0] is pointing towards B[1] and so on. At the end, display the contents of both the arrays.



Task 3:

Give an array of pointers of size N, task is to perform following:

1. Program should calculate unique numbers in array and print and their count on console. This should be done in a separate header file (**findUniqueNumber.h**). Main file should include this header file and call appropriate function defined in this header file.

2. Program should remove all repetitive elements in array and print the array after removing them. This should be done in a separate header file (**RemoveRepetitiveElements.h**). The main file should pass an array to appropriate function.

You can initialize the array by hardcoding it.

Task 4:

Write a script that finds the size of a specified file (in bytes). The logic should be implemented in a function defined in a separate header file (**FindSize.h**).

Task 5:

You are provided with file "dictionary.txt", read file and do following tasks. All the logic should be implemented in a function defined in a separate header files. Main should only call relevant functions from the header file(s).

1. Count no of words that have two A or a in them

2. Count statistics for all alphabets i.e. how many words starting with AA, BB, CC,...,ZZ. Words

may start from small letters as well, count both of them together. At the end display count of all

and sum total

3. For each five letter length word read, calculate a code for each word that is:

For first letter, subtract capital A or small a from each character to get character code

For second letter, add capital A or small a from each character to get character code

now apply formula: first letter * 10000 + second letter * 1000 + third letter * 100 + fourth letter *

10 + fifth letter

4. Count how many words do not have a repeated code.