National University of Computer & Emerging Sciences, Karachi

School of Computing

Fall-2021

CS1002 – Programming Fundamentals

Assignment # 4

Max Points: 100 **Due Date:** 06-Dec-2021

Carefully read the following instructions!

- It should be clear that your assignment would not get any credit if the assignment were submitted after the due date.
- Strict actions will be taken if submitted solution is copied from any other student.
- For any query, feel free to email at: murk.marvi@nu.edu.pk
- If you find any confusion in assignment (Question statement), please consult before the deadline. After the deadline no queries will be entertained in this regard.
- **Submission:** Submission will only be accepted through GOOGLE CLASSROOM. You can scan or even take pictures of all your paperwork. You are required to submit a doc. file containing all your paperwork. Before submission, rename your doc. file as your ID **"KXX-XXXX".**

Question 1: Write a function that accepts marks received by a student in 3 subjects and returns the average and percentage of these marks. Call this function from main ( ) and print the results in main ( ).

Question 2: A 5-digit positive integer is entered through the keyboard, write a function to calculate sum of digits of the 5-digit number using recursion.

Question 3: Write a recursive function to obtain the first 25 numbers of a Fibonacci sequence. In a Fibonacci sequence the sum of two successive terms gives the third term. Following are the first few terms of the Fibonacci sequence: 1 1 2 3 5 8 13 21 34 55 89.

Question 4: Create a function display () that accepts an integer array of 10 elements and return sum, min and max value from the function.

Question 5: Create a function sort () that accepts an integer array address and sort the array and return it back to main (). You can use any sorting algorithm.

Question 6: Write a function increment that increment the values of any integer array by 2.

Question 7: The area of a triangle can be computed by the sine law when 2 sides of the triangle and the angle between them are known. Area = (1 / 2) a.b sin (angle). Given the following 6 triangular pieces of land, write a program to find their area and determine which is largest,

Plot No.	a	b	angle
1	137.4	80.9	0.78
2	155.2	92.62	0.89
3	149.3	97.93	1.3
4	160.0	100.25	9.00
5	155.6	68.95	1.25
6	149.7	120.0	1.75

Question 8: Write a program that compares two given dates. To store date use structure say date that contains three members namely date, month and year. If the dates are equal then display message as "Equal" otherwise "Unequal".

Question 9: Write a menu driven program that depicts the working of a library. The menu options should be:

1. Add book information
2. Display book information
3. List all books of given author
4. List the title of specified book
5. List the count of books in the library
6. List the books in the order of accession number
7. Exit

Create a layout based on arrays to hold book number, title of the book, author name, price of the book, and flag indicating whether book is issued or not.

Salman
Zubair
Ahsan
Farah
Hassan
Kamran
Mariyum
75.5
80
64
78
65
54
60
1001
1002
1004
1005
1007
1008
1009

Question 10.

roll_no	std_names	std_marks

Suppose the above data is stored in an array where the index number is mapped for the record reference. For example the Roll number in index 0 of first array, corresponds to the name in index 0 of the second array and the student marks are placed in third array on the same index.

a. Write a function that will sort the data according to the marks obtained.
b. Write a function to search and print the data based on a roll number.
c. Write a function to search and print the data based on name.