National University of Computer and Emerging Sciences

Lab Manual # 8

Programming Fundamentals Lab

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Section	BCS-1K
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Objectives:

Students will practice:

- Sorting.
- Functions.
- Arrays and Char arrays.
- Binary search.

Instructions:
Use the provided switch case to write your programs in all Labs

Questions:

1. Write a program to implement a calculator using functions. Make functions sum, diff, div, prod, and mod. Your program should take input from the user for the operation and the values. Pass the values to the respective functions using the option. For div, the user should be prompted with an error message if denominator is zero.
2. Implement the following functions. The functions return a real number:

    a) Function Celsius returns the Celsius equivalent of a Fahrenheit temperature (Hint: 0 Celsius is equal to 32 Fahrenheit and 100 Celsius is equal to 212 Fahrenheit).

    b) Function Fahrenheit returns the Fahrenheit equivalent of a Celsius temperature. Use these functions to write a program that prints charts showing the Fahrenheit equivalent of all Celsius temperatures between 0 and 100 degrees, and the Celsius equivalent of all Fahrenheit temperatures between 32 and 212 degrees. Print the output neatly in a table (make neat rows and col using space new line and tab).

3. Write a program to declare an integer array of 10 elements:

    a) Write a function getArray() to get array input from the user that will be used to initialize the array by getting input from the user.

    b) Write a function FindEven() to find the total numbers of even numbers in the given array.

4. Write a program that takes 10 values from the user in an array and sorts them in descending order using Bubble sort.
   Input: 2 5 7 6 9 8 3 1 0 4
   Output: 9 8 7 6 5 4 3 2 1 0

5. Write a similar bubble sort program but instead of an integer take char input from the user in an array and sort in alphabetic order.
   Input: c f a b d e
   Output: a b c d e f

6. Write a function that finds the area of the rectangle by providing length and width. Get the Length & width from the user in main() Call the function area() Calculate the length and return the area Display the result in main().

7. Develop a program that swaps the two values using a function by reference i.e

	After swap
a = 22.2	a = 44.4
b = 44.4	b = 22.2

8. Write a binary search algorithm where the user is asked to enter 10 values in an array and a value to find in an array. Use binary search to find the value and print its index value to the user.
   Input: arr[] = {10, 20, 30, 50, 60, 80, 110, 130, 140, 170}, x = 110
   Output: 6

   Input: arr[] = {10, 20, 30, 40, 60, 110, 120, 130, 170}, x = 175
   Output: -1 or not found