Homework #2

Data Structure (501324-3)

Fall 2023

Due: Saturday October 7, 2023, 11:59 pm via Blackboard

Required:

- Answer all the following questions.

- Implement and show the output of each question.

- In each code, add a comment // your name // your id.

- NO homework will be accepted without this comment.

- Put everything in one PDF file and upload it.

- NO LATE homework or excuses will be accepted. I gave you enough time to work on this homework.

Question 1:
Implement a C++ program that multiples two numbers using pointers.

For testing, do the following:
Enter the first integer: 8
Enter the second integer: 11

Expected output:
The multiplication of the two integers is: 88

Question 2:
Implement a C++ program that uses call by reference (in pointers) to multiply two numbers.

For testing, do the following:
Enter the first integer: 8
Enter the second integer: 11

Expected output:
The multiplication of the two integers is: 88

Question 3:
Implement a C++ program that uses call by reference to calculate the factorial of a given integer using pointers.

For testing, do the following:
Enter an integer: 4

Expected output:
The Factorial of 4 is: 24

Question 4:
Implement a C++ program that uses pointers to calculate sum of all elements in an array of integers.

For testing, do the following:
Enter the element # 1: 2
Enter the element # 2: 3
Enter the element # 3: 6
Enter the element # 4: 1
Enter the element # 5: 7

Expected output:
The sum of the array is: 19

Question 5:
Use structure data type to enter the marks of 5 students in Programming, Algorithms, and Math courses (each course grade is out of 100). Then calculate and print the percentage of each student.

That is, build a structure name StudentRecord that has five elements as follows:
- Number
- Name
- Programming_marks
- Algorithms_marks
- Math_marks

Then define an array of this structure, enter the data, and calculate and print the required.

Question 6:
Write a C++ program that contains a structure specification that includes four variables: student name (less than 20 characters), homework grades (an array of four elements; each is out of 100), test grades (an array of three elements; each is out of 100), final average (the weighted average of the homework grades and test grades). Call this structure Student.

- Declare an array of three elements named studentlist from Student.
- Enter name, homework marks, test marks, and then calculate the weighted average for each tuple.

Question 7:
Write a C++ program that contains a structure, named student, that includes three variables: name (less than 30 characters), roll number (integer type), and date of birth (structure type; i.e., use nested structure).

- Declare a variable named s from student.
- Enter the s's name, roll number, and date of birth.
- Dispaly the s's name, roll number, and date of birth.