

Homework #2

Data Structure (501324-3)

2022-2023 1st Trimester

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 multiplies 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.
- Display the s's name, roll number, and date of birth.