**INSTRUCTIONS:**

* Please read each instruction carefully.
* Open book and lecture notes (additional material is not allowed).
* Use Visual Studio / Visual Studio Code software to solve the problems.
* Read the questions carefully and make sure that you answer all the parts of the questions.
* Insert your solution for each problem into the empty cells given below the questions. You may extend the cells when it is required.
* Save your answers (this file) often to avoid information loss!
* Save this document as “your\_id.docx” and submit it through Bilgi Learn before the end of the exam.
* Any late submissions will not be graded.
* Submissions through e-mail WILL NOT be graded (i.e., those submissions will get zero grades).  
  Only the submissions made to the Bilgi-Learn system will be taken into consideration.
* Any objections to system-based problems (like loss of internet connections at the last minute or submitting at the last second and not being able to catch the system deadline) will not be accepted.
* Please make sure that your program executes and meets all the requirements without error.

**Problem 1.** (50 pts)

Write a program in C that achieves the following tasks:

* Form a structure called OrderRecord with the following members: (10 pts)
  + Name (char array)
  + Surname (char array)
  + Product (char array)
  + Quantity (int)
  + Price (float)
* Create three instances of the structure with arbitrary order data. (10 pts)
* Write a function taking the structure as input and returning the new price after applying a user-defined discount amount to the previous (old) price. (15 pts)
* Write a function that saves the name, surname, product, quantity, discount, old price, and new price to a text file. The output format (in the text file) must be as given below. (15 pts)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Name | Surname | Product | Quantitiy | Old Price [$] | Discount [%] | New Price [$] |
| John | Doe | Laptop | 1 | 1000 | 5 | 950 |
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**Problem 2.** (50 pts)

Write a C++ program to do the following tasks:

* Create a Class called Force with the following private data members: (5 pts)
  + X (float type)
  + Y (float type)
  + Z (float type)
* Create the constructor methods for: (10 pts)
  + No input arguments (default values: X=3, Y=4, Z=5)
  + One input argument (default values: Y=10, Z=10)
  + Two input arguments (default values: Z=13)
* Create **set** and **get** class methods (class functions) for each member where: (10 pts)
  + The **get** method will return and print the value of the data member
  + The **set** method will change the value of the data member
* Create a **magnitude** class method that performs the following task: (10 pts)
  + Method should return the value of
* In the main function create an instance of the Vector class: (15 pts)
  + with no input arguments
  + with
  + with and . For this instance of the class, show the functionalities of **set**, **get**, and **magnitude** methods.

Note: Show the content of different files in a different table.

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