COS 120 – C++ Programming – Fall 2022

Homework 3

**If your Student ID is an even number, solve Task 1, if your Student ID is an odd number, solve Task 2.**

**Deliverables (via Canvas :** [**https://aubg.instructure.com/**](https://aubg.instructure.com/)**)**

1. **Zipped** **project folder** of your program.

2. Demonstration to me, on demand.

**Notes**

* Think carefully about the code in your programs – variable names, comments, etc.
* Programs must be fully commented – add a comment in the beginning describing what your program does and how! Also add any other comments where necessary.
* Do all of the calculations/validations of the data in the class that is created.
* Do not allow invalid data to be stored in the data items.
* For both tasks you should provide:
  + **Header** file with the class declaration
  + **Implementation** file (cpp) with the implementation of the class
  + **Test Diver** class (cpp) with main function

**Deadline**

The deadline for the homework can be checked in canvas.

**Late work will be accepted but penalized**.

**Task 1 – Student**

Create a class ***Student*** that has three **private** data items – *name, major, age*. Provide appropriate setters/getters for all of the data items, provide the necessary validations of the data if needed. Include default constructor and three-argument constructor. Provide additional ***gettingOlder*** method that increments the age with 1.

Provide also method ***display***, that would display the information about a student in the following format:

*Student: <name> with major <major> of age: <age>.*

Write a program to read a text file **students.txt** that contains information about students in the following format:

<student name>#<major> <age>

Read the file and for each student display the information using the display method from the class. Also find the youngest and oldest student and display their names.

***Example File Contents:***

*John Smith#COS 20*

*Tom Taylor#BUS 19*

*Ivan Markov#INF 21*

***Output:***

*Student: John Smith with major COS of age: 20.*

*Student: Tom Taylor with major BUS of age: 19.*

*Student: Ivan Markov with major INF of age: 21.*

*The youngest student is Tom Taylor and the oldest is Ivan Markov.*

**Task 2 – Products**

Create a class ***Product*** that has three **private** data items – *name, unitPrice, quantity*. Provide appropriate setters/getters for all of the data items, provide the necessary validations if needed. Include default constructor and three-argument constructor. Provide additional ***getTotalPrice*** method that calculates the total price – unitePrice \* quantity.

Provide also method ***display***, that would display the information about the product in the following format:

*<name> <quantity> x <unitePrice>, so the price is: <the calculated price>.*

Write a program to read a text file **products.txt** that contains information about products in our shopping cart in the following format:

<name>$ <unitPrice> <quantity>

Read the file and for each product display the information using the **display** method from the class. Also find the total price of our shopping cart represented by the products in the file.

***Example File Contents:***

*Coca cola$ 1.5 10*

*Water$ 2 23*

*Paper$ 20 2*

***Output:***

*Coca cola 10 x 1.5, so the price is: 15.*

*Water 23 x 2, so the price is: 46.*

*Paper 2 x 20, so the price is: 40.*

*The total amount we have to pay is 101.*