Week 5: Static and Const member function, String object, Array object

** You have to implement these topics in the lab

Task 1

Create a class - Product that represents products in an inventory system. It has private data members- name, id, price, quantity, category and availability status. It may need other member data for following functions. Price and quantity should be 0 if not mentioned otherwise. Implement the following public member functions:

- Product()
- Product(name, id, price, quantity)
- void addToInventory(int added_quantity) – add a specified quantity to the product.
- void purchase(int purchased_quantity): – if the product is available, then purchase items of given quantity.
- applyCategoryDiscount(float percent)
- applyProductDiscount(float percent) – apply percent% discount to the price. However, if categoryDiscount is already applied, it'll not work.
- int updatePrice(int percent) – Add percent% to the current price.
- float displayInventoryValue() - Display the total value of a particular product in inventory (quantity * price)
- void getTotalInventoryValue () - Display the total value of all the available products in inventory.
- ~Product() - prints the details of the product.

Take input of at least 3 products each for 3 different categories and implement in a way that all the functions have been used. (If you need to use any private member, get the values using a function). Implement static and const member function where needed

Task 2

Create a Medicine class which has private data members - name, genericName, discountPercent, unitPrice, number of items. The default price will be 0 and discount rate - 5%. An object of a medicine class will have a unit price which is the maximum retail price. At any time a medicine can have a 0-45 % discount. It may need other member data for following functions. Implement the following member functions:

- Medicine ()
- Medicine (name, generic name, unit price)
- double updatedPrice(int percent) – return the updated price after applying discount.
- double getSellingPrice(int nos) - this member function returns the selling price of the medicine for given nos of unit price . Selling price = price - discount.
- double readjustedPrice()- after giving a discount readjust the price for remaining medicines, so that the loss is recovered. Example: you have initially 10items worth of 10tk

each. Total will be 100tk. After 1% discount you have sold 5 items for 45tk. Now you have to sell remaining 5 items for 55tk. Calculate the unit price of them (price of one item).

- void resetPrice(): reset to initial price and display the price
- ~ Medicine () - displays the information of a medicine object in the console.

Take input for at least 3 objects and implement in a way that all the functions have been used and also return the total price of the sold medicines. (If you need to use any private member, get the values using a function). Implement static and const member function where needed.

Task 3

Create a class to represent a Student information which has private data members- first name of the student, last name of the student, student id, birth year, course, and obtained marks, total number of students. Whenever a student object is created the total number of students will increase. Implement the following member functions (task of the function is written after a hyphen):

- Student(firstName, lastName, id)
- void enrollInCourses(string courseName) – students can enroll in multiple courses. Also set the initial obtained marks to 0.0
- void obtainedMarks(string courseName, float marks) – assign marks for each courses.
- float setGPAForEachCourse()- returns the gpa of the course.(You can follow the traditional grading system or make your own)
- float displayCGPA()- calculated the CGPA from GPA.
- void willGraduate() – prints whether the student will graduate or not with the current marks
- void applyForScholarship() – If the CGPA is higher than 3.8, then students can apply for scholarship.
- void participateInInternship(string company) – If the CGPA is higher than 3.0 and the student has taken “X” course, then s/he can do an internship at “Y” company.
- ~ Student () – prints student full name, id, email,courses, graduation status, scholarship status and internship status.

Take input for at least 3 students with minimum 3 courses and implement in a way that all the functions have been used and also return the average CGPA of the 3 students. (If you need to use any private member, get the values using a function). Implement static and const member function where needed.