FAST- National University of Computer & Emerging Sciences, Karachi.
School of Computing,
Mid Term Examination, Fall 2021
10th November, 2021, 8:00 am – 10:00 am

Course Code: CL-1004	Course Name: Object Oriented Programming Lab
Instructors: Nida Munawar, Abecha Sattar	
Student Roll No:	Section:

PAPER - A

Instructions:

- Except your Roll No and Section, DO NOT WRITE anything on this paper.
- Return the question paper after the exam.
- Read each question completely before answering it. There are **2 questions on 2 pages.**
- In case of any ambiguity, you may make assumptions but your assumption must not contradict any statement in the question paper.

Time Allowed: 120 minutes **Maximum Points:** 20

Question 01- Dynamic Memory Allocation, Constructors and Destructors [points: 10]

You are working for a library and they want to update the way that they manage their books. Create a class called **Book** which contains the following private attributes:

- Name → String
- ISBN → String (The ISBN is issued at the time of object creation and cannot be changed afterwards)
- Author → Char* (assume 30 characters)
- Genre → String
- Count → Keeps track of number of Book objects created

Your program should allow a user to input the number of books that they want to add, then create an array to store those books.

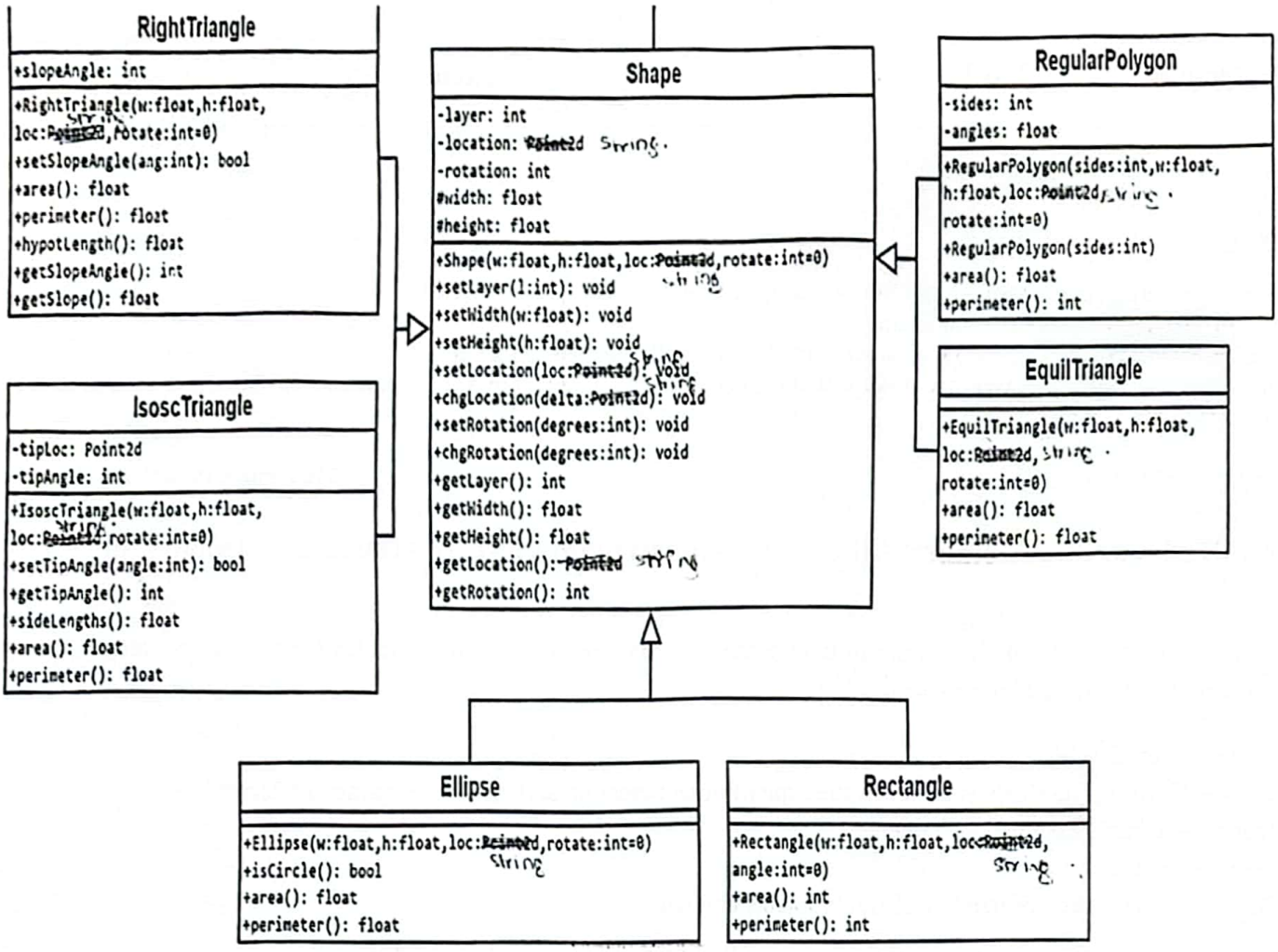
Your program should also fulfil the following criteria:

- Should be menu-driven
- Should allow the user to input all the Book details.
- Should make use of parametrized and copy constructors as necessary. Constructors should increase the **[Count]** by 1.
- Should have a destructor that deallocates memory allocated by **[Author]** and should also decrease the **[Count]** by 1.
- Should allow the user to edit all attributes **individually** (except **[ISBN]** and **[Count]**)
- Should be able to display the number of books in the library at any giving point
- Finally, demonstrate the working of your copy constructor by adding the following two lines of code:
  - **Book bookOne(//your parametrized constructor values);**
  - **Book bookTwo(bookOne);**
  - **Book bookThree = bookTwo;**

Hint: Keep in mind all of the concepts that have been covered during different labs.

Question 02- Inheritance

[points: 10]



Implement the inheritance depicted in Figure and provide implementation for all attributes methods and constructors.

Note: For any polygon, perimeter is the sum of its sides.
Perimeter of an ellipse = 3.142 x (a + b) - a and b would be width and length here
Area of a triangle = (base x height)/2
Area of a rectangle = length x width
Area of a regular polygon (for simplicity, use this) = (number of sides x length of sides)/2
Hint: All sides are equal in length for regular polygons

Best of Luck ☺

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PAPER - B

Instructions:

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- Return the question paper after the exam.
- Read each question completely before answering it. There are **2 questions on 2 pages.**
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Time Allowed: 120 minutes **Maximum Points:** 20

Question 01- Dynamic Memory Allocation, Constructors and Destructors [points: 10]

You are working for a supermarket and they want an automated system to manage their inventory. Create a class called **InventoryItem** which contains the following private attributes:

- Name → String
- BarCode → String (The BarCode is issued at the time of object creation and cannot be changed afterwards)
- BrandName → Char*
- Stock → Integer
- ItemCount → Keeps track of number of InventoryItem objects created

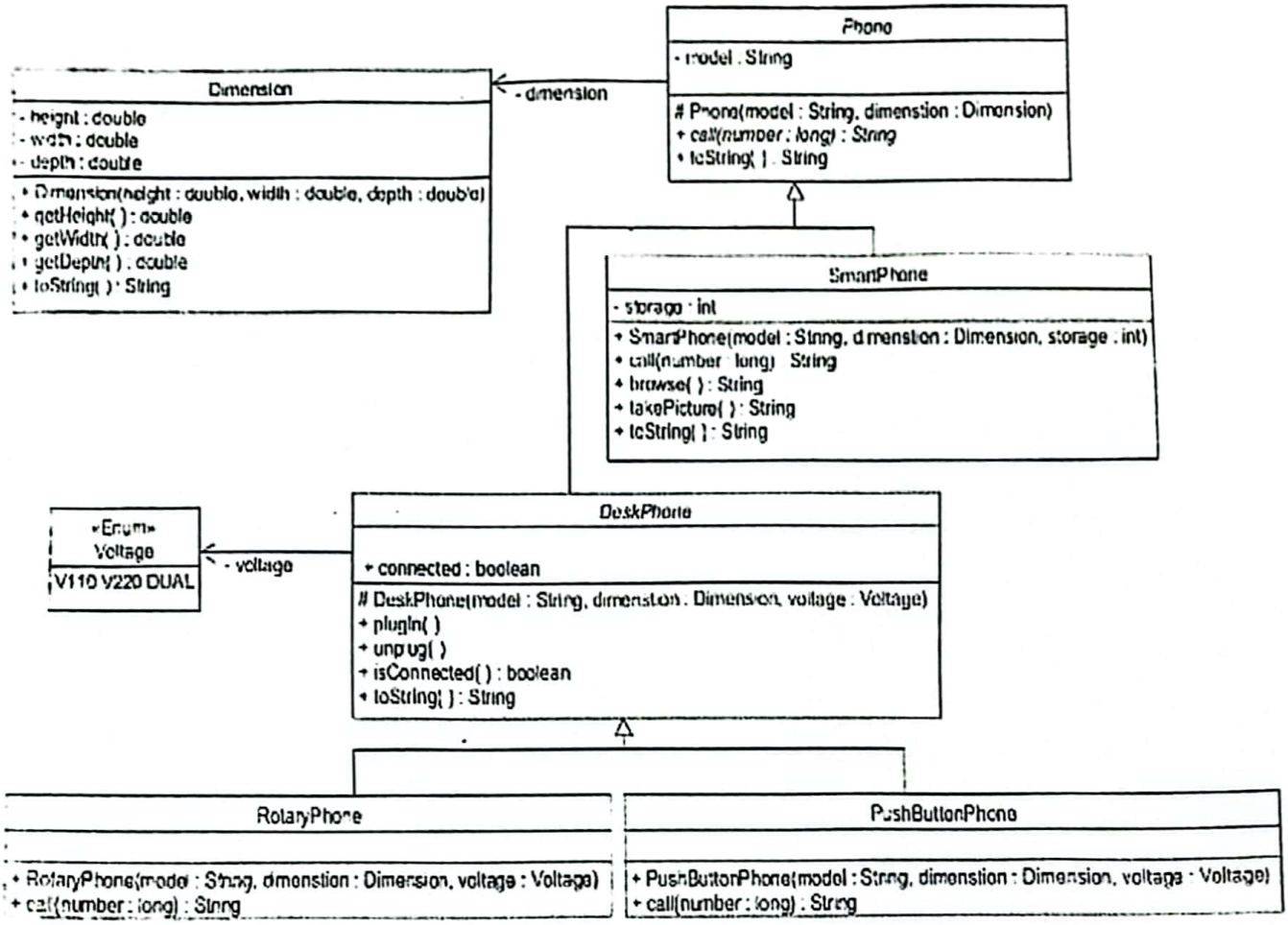
Your program should also fulfil the following criteria:

- Should be menu-driven
- Should allow the user to input all the InventoryItem details.
- Should make use of parametrized and copy constructors as necessary. Constructors should increase the **[ItemCount]** by 1.
- Should have a destructor that deallocates memory allocated by **[BrandName]** and should also decrease the **[ItemCount]** by 1.
- Should allow the user to edit all attributes **individually** (except **[BarCode]** and **[ItemCount]**)
- Should be able to display the number of items in the inventory at any giving point
- Finally, demonstrate the working of your copy constructor by adding the following two lines of code:
  - **InventoryItem itemOne(//your parametrized constructor values);**
  - **InventoryItem itemTwo(itemOne);**
  - **InventoryItem itemThree = itemTwo;**

Hint: Keep in mind all of the concepts that have been covered during different labs.

Question 02- Inheritance

[points: 10]



Implement the inheritance depicted in Figure and provide implementation for all attributes methods and constructors.

Best of Luck ☺