



## ASSIGNMENT (6)

### Question (1):

Write a class that defines a **Student**. Any student has a Registration Number, Name, Major, and GPA. This class should contain methods for setting values to these attributes, as well as methods for getting their values.

In the main function:

- Create two objects of **Student**.
- The program asks the user to enter the data of the first student and assigns this data to the student's attributes (through the methods).
- Then, the program asks the user to enter the data of the second student and also assigns this data to the student's attributes (through the methods).
- Finally, the program compares the GPAs of the two students and prints only the data of the student of the higher GPA. If the two students have the same GPA, then the program should print the data of both of them.

### Question (2):

Create a class that defines a **Circle** that has three attributes: radius and, x and y which define the center of the circle. The class contains the following methods:

- Methods for *setting* the attributes of the circle, and validating that the radius must be greater than zero (if the radius is negative, it is reset to 1).
- Methods for *getting* the attributes of the circle.
- A method that returns the area of the circle ( $area = \pi r^2$ ).
- A method that returns the circumference ( $circumference = 2\pi r$ ).
- A method that returns the diameter ( $diameter = 2r$ )

In the main function:

- Create three **Circles**.
- The program asks the user to set the data of the three circles (their radii and center points).
- Then, the program determines which of the three circles has the largest area, and prints its data (i.e. its center point, radius, diameter, area and circumference).



**Question (3):**

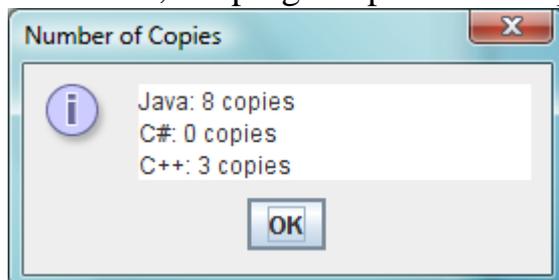
Write a class that defines a **Book** for a library. Any book has the following attributes: Title, Author, Price, Number of Copies, and Publish Year. This class has methods to set the book's data, as well as methods to get the book's data. Also, this class contains a method called BorrowBook which decrements the number of book copies if there are any (if there are no copies anymore, the method displays the appropriate message). The class also has a method called ReturnBook which increments the number of copies.

In the main function, write a program that executes the following scenario:

- Create three **Books**.
- The program asks the librarian to enter the data of each of the three books, using the following data:

Title: <b>Java</b>	Title: <b>C#</b>	Title: <b>C++</b>
Author: <b>Schildt</b>	Author: <b>Deitel</b>	Author: <b>Deitel</b>
Price: <b>35.50</b>	Price: <b>39.99</b>	Price: <b>30.00</b>
Copies: <b>10</b>	Copies: <b>3</b>	Copies: <b>5</b>
Publish Year: <b>2007</b>	Publish Year: <b>2006</b>	Publish Year: <b>2004</b>

- The librarian lends four copies of the first book, three copies of the second book, and two copies of the third book (using the method BorrowBook).
- Two copies of the first book are returned back (using the method ReturnBook).
- The librarian needs to know the number of copies available for each book. Therefore, the program prints the required information.



- The librarian attempts to lend one copy of the second book. Therefore, the method BorrowBook displays the appropriate message.





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- The librarian needs to know which book is the most recent. Therefore, the program compares the publish year of each of the three books and prints the information of the most recent book.

