



Aror University of Art, Architecture, Design & Heritage Sukkur.

__ Department of Artificial Intelligence and Multimedia Gaming

Object Oriented Programming(Spring-2025)

LAB No. 4

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Objective of Lab No. 4:

After performing lab4, students will be able to:

- o Implement classes in Java and Create Objects
- o Use Default constructor and new operator
- o Use Dot Operator
- o Modify default and create Parameterized constructor
- o Implement void and return type methods

Lab Exercises:

1. Create a class circle with attributes radius and color, Now:
 - a. create two objects namely red_circle and green_circle in the main method using default constructor.
 - b. Add a method named calculateArea() which calculates the area of calling object and prints it on the console screen, note the method does not return any value and accepts no parameter.
 - c. Use dot operator to initialize the instance variables of red_circle and green_circle (Use any radius value)
 - d. Now print the radius of both circles (Use Dot Operator with instance variables)
2. Now Modify the Task 1 in following way:
 - a. Initialize the instance variables using parameterized constructor
 - b. calculateArea() method returns the area of calling object, choose return type wisely.
3. Create a class called Bank Account with attributes balance and AccountNumber:
 - a. Create two Objects namely acc1, acc2 with parameterized constructor, (Initial balance of account 1 is 1000 and account 2 is 500).
 - b. Implement methods to deposit, withdraw and check balance of an account.

- c. Deposit 500 in account 1 and 1500 in account 2 with the help of method.
 - d. Check balance of both accounts now.
 - e. Withdraw 500 from account 1 (Make sure you have that much balance...)
 - f. Check balance of account 1.
 - g. Withdraw 3000 from account 2.
4. Write a program that would print the information (name, year of joining, salary, address) of three employees by creating a class named 'Employee'. The output should be as follows:

```
Name Year_of_Joining Address
Robert 1994 WallsStreat
Sam 2000 WallsStreat
John 1999 WallsStreat
```

5. Create a class student having attributes id, name and grades (array of 5 double elements) a. Initialize the above given attributes with the help of parameterized constructor by creating 2 objects.
- b. Add a method display_average_grade() which displays the average grade of calling object.
 - c. Add a method calc_percentage() which converts each numeric grade into percentage form and returns the array of percentages, remember maximum marks for each grade are 200.
 - d. Add a method called concat_id_name, which concatenates the id and name of student and returns the concatenated result.
 - e. Demonstrate the use of all the above methods by calling them over the objects.
6. Create a class matrix, with attributes number of rows and number of columns, and a matrix of size rows and columns named matx:
- a. Add a constructor which sets the number of rows and number of columns when an object is created.
 - b. Add a get_matrix() method which displays the elements of matx of a matrix object c. Add a method called set_element() which accepts row number and column number along with the value, and sets the value at that row number and column number. d. Create an object matrix1 having 4 rows and 3 columns.
 - e. Create an object matrix2 having 3 rows and 3 columns.
 - f. Initialize the matx attribute of both matrices.
 - g. Update the element of matx of matrix one at row number 1 and column number 2 with 3.
 - h. Call get_matrix() on both objects.