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

Department of Artificial Intelligence and Multimedia Gaming

Object Oriented Programming(Spring-2024)

LAB No. 3

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Objective of Lab No. 3:

After performing lab3, students will be able to:

- Implement Logical and Relational Operators in Java
- Implement Selection Statements in Java
- Implement Iteration Statements in Java
- Implement jump statements in java
- Implement Nested Loops in java
- Use All the above concepts to solve real life problems

Lab Exercises:

1. **Create a java class and do the following:**
   a. Create an array to store 4 seasons of an year
   b. Use foreach loop to print each of the array element
   c. Use for loop to iterate over the array elements, and inside the loop use if-else-if statement to check the season and print months of that particular season.

2. **Generate the following sequences using both for loop and while loop separately.**

```
run:
1       39
4       34
7       29
10      24
13      19
16      14
19      9
22      4
```

3. **Create a matrix like shown below:**

```
12  13   15   16
11  110  121  17
17  18   100  21
```

a. Divide each even number from the matrix by 2 and store the updated value in the matrix.
b. Now use for-each loop to iterate over the matrix and display the Odd Numbers from the matrix.
c. Use for loop to do the sum of updated even numbers from the matrix

4. **Write a java program to do the following:**
    a. Populate an array having size 10 using a do while loop with following sequence: 1, 4, 9, 16, 25, 36, 49, 64, 81, 0 using a do while loop.
    b. Now use while loop to do the sum of odd numbers from this array and skip the even numbers using appropriate jump statements.
    c. Break the loop as soon as 81 is encountered.

5. **Design a simple seat reservation system for a theatre, the Algorithm for the program is given below:**
    a. Create theatre structure by determining the number of rows and number of columns, rows and columns will determine the total number of seats.
    b. Use a do while loop to display the following messages, loop will be terminated when user presses 3:
        i. Display available seats: 1
        ii. Reserve a seat: 2
        iii. Exit: 3
        iv. Enter your choice:
    c. Now use a switch case statement inside the do while loop
        i. If user presses 1 then display the available seats, available seats are represented by false and unavailable seats are represented by true.
        ii. If user presses two, then ask the user row number and column number (Hint: subtract -1, indexing starts from zero)
        iii. Check if the seat is not reserved already then reserve the seat, otherwise display seat is already reserved.
        iv. If row number and column number are out of the range then display invalid range.
    d. Default choice of switch will display invalid choice, if the user provides any number which is out of the given range (1-3)

6. **Write java code to generate prime numbers in a given range (You can also use Math.sqrt() function)**

7. **Write java program to check wether a string is Palindrome or not (Hint: use string.charAt() method)**

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