Nepathya College
Tilottama-5, Rupandehi

Object Oriented Programming in Java
Lab 2

Objective: To learn about tokens, expressions, functions, array conditionals in Java.
Descriptions:

- **Refer theory from the slides.**
- **Java Input**
  - Several ways to get input from the user in java, using **Scanner** object is one of them.
  - We need to import Scanner class using
    - import java.util.Scanner;
  - We can create an object of Scanner class which is used to get input from the users
    - Scanner input = new Scanner(System.in);
    - int num = input.nextInt();
  - **input** object of **Scanner** class is created. Then, the **nextInt()** method of the **Scanner** class is used to get integer input from the user.
  - To get long, float, double and String input from the user, you can use nextLong(), nextFloat(), nextDouble and next() methods respectively.

<u>**Programs**</u>
Note: The program should be well formatted i.e. proper use of indentation, comment, description of program and functions etc.

1. Run and find the output of the following program.

```java
// Java program to illustrate the application of literals

public class Test {
    public static void main(String[] args)
    {
        int a = 101; // integer-form literal
        float b = 101.230; // decimal-form literal
        char ch = 'a'; // single character literal within single quote
        String s = "Hello"; // String literals
        boolean d = false; // boolean literals

        System.out.println(a);
        System.out.println(b);
        System.out.println(ch);
        System.out.println(s);
        System.out.println(d);
    }
}
```

2. Find the error in the program and complete the following program.

```java
public class light {

    public static void main(String[] args) {

        int lightspeed = 186000;
        long days = 1000;
        …..........................................

        seconds = days * 24 * 60 * 60;

        distance = lightspeed * seconds;
        …...............................................
    }
}
```
<u>**Output**</u>

```
In 1000 days light will travel about 16070400000000 miles.
```

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3. Complete the following program in Java.
```java
// Compute the area of a circle.
public class Area {
        public static void main(String args[])          {
                …................
                a = pi * r * r; // compute area
                …...........................
        }
}
```

Output

```
Area of circle is 366.436224
```

4. Complete the following program in Java to demonstrate the Boolean values.

```java
public class booltest {
        public static void main(String args[]) {
                boolean b;
                b = false;
                System.out.println("b is " + b);

                if(b) System.out.println("This is executed.");
                        b = false;
                if(b) System.out.println("This is not executed.");

                System.out.println("10 > 9 is " + (10 > 9));
        }
}
```

Output

```
b is false
b is true
This is executed.
10 > 9 is true
```

5. Run the following program to demonstrate the block scope.

```
// Demonstrate block scope.
class Scope1 {
        public static void main(String args[]) {
        int x; // known to all code within main
                x = 10;
                if(x == 10) { // start new scope
                        int y = 20; // known only to this block
                        // x and y both known here.
                        System.out.println("x and y: " + x + " " + y);
                        x = y * 2;
                }

                y = 100; // Error! y not known here
                // x is still known here.
                System.out.println("x is " + x);
        }
}
```

6) Which of these is an incorrect array declaration?
a) int ary[] = new int[5];
b) int ary = int[5] new;
c) int[] ary = new int[5];
d) int ary[]; ary = new int[5];

7. Complete the following program that demonstrate that use of Scanner class.

```
…..........................................................
public class userinput{
        public static void main(String[] args){
                …..............................................................
                System.out.println("enter a integer");
                int myint = input.nextInt();
                System.out.println("Integer entered by user is "+myint);


                …..............................................................
                …..............................................................
        }
```

```
enter a integer
10
Integer entered by user is 10
enter a float
20.9999999
Float entered by user is 21.0
enter a double
20.99999999
```
Prep Double entered by user is 20.99999999
```
enter a text

Hello
Text entered by user is Hello
```

}
Output

8. Write a program in Java to check a number is even or odd.

9. Write a Java program to display all the even numbers from 1 to 500.

10. Write a program to get sum of 10 numbers.

11. Write a program to sum of two number entered by a user.

12. Write a program to display the Fibonacci series based on the user input.

13. Write a program for finding factorial of a number entered by user.

14. Write a program in Java to create the following shape.

15. Write a Java program to get number from the user and print whether it is a positive or negative.

16. Write a Java program that takes input from 1 to 7, and display the name of the weekday.

17. Write a program in Java that takes user input character from the alphabet and prints VOWEL or CONSONANT. If the user input is not a letter i.e. between 'a' and 'z' or 'A and 'Z', then prints "not an alphabet."

18. A school has following rules for grading system:
      a. Below 25 – F
      b. 25 to 45 – E
      c. 45 to 50 – D
      d. 50 to 60 – C
      e. 60 to 80 – B
      f. Above 80 – A
Ask user to enter marks and print the corresponding grade.

19. Write a program to print first 20 Fibonacci numbers and compute their average.

20. Write a program called sphere computation that prompts user for the radius of a sphere in floating point number. The program shall read the input as double; compute the volume and surface area of the sphere in double; and print the values rounded to 2 decimal places.

NOTE

Volume of sphere = 4/3 πr^3
Surface area of volume = $4\pi r^2$

To print double with 2 decimal places
```java
double value = 200.3456;
System.out.printf("Value: %.2f", value);
```

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21. Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.

22. Create a new Java program called ArrayProgram.
- **Declare and create an array   newNumbers which can contain 12 int numbers**
- **Assign these values into newNumbers 10, 6, 88, 91, 25, 77, 14, 23 ,4, 235, 66, 81.**
- **Find and display the length of the array**
- **Display the value stored in the 5ᵗʰ element of the array**
- **Change the value in the 5ᵗʰ element to 35. Display again.**
- **Calculate and display the average of the values stored in the array (use the length attribute).**

Output
```
The length of array is 12
The value stored in the 5th element of the array 25
The value in the 5th element is changed to 35
The average of the values stored in the array 60
```

23. Create an array of integers, then print the odd and even number in an array.

Output
```
Enter number element in an array
5
Enter number all the elements of an array
40
33
23
56
22
The even numbers are: 40 56 22
The odd numbers are: 33 23
```

24. Write a Java program that asks the user to enter numbers in an array of size 'n'. Then displays only the numbers that are divisible by 2 and 3.

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25. Write a program that asks that user to enter elements in a matrix of size m x n and then display the sum of elements.

26. Write a program that asks the user to enter names of any 7 countries. Then the user is required to count and display those countries that ends with a vowel.

27. Write a Java program that checks whether a given string is a palindrome or not.

28. Write a program that prompts user for a positive integer. The shall read the input as int; compute and print the sum of all its digits.

29. Write a program that prompts two number from the user and add them to give the sum of those number. Make a separate function to sum the numbers.

30. Write a method that takes two integer as parameters and adds up all the numbers from the first number to last and print the sum.

Output

```
Enter the two number
1
10
The series of number is 1, 2, 3, 4, 5, 6, 7, 8, 9, 10,
The total sum is 55
```

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