

C-DAC Mumbai

Lab Assignment

Question 1: Print Numbers from 1 to N

Problem Statement:

Write a Java program that asks the user for a number N and then prints the numbers from 1 to N using a for loop.

Sample Input:

Enter a number: 10

Expected Output:

1 2 3 4 5 6 7 8 9 10

Question 2: Print Multiples of 3 between 1 and N

Problem Statement:

Write a Java program that asks the user for a number N and prints all the multiples of 3 between 1 and N using a for loop.

Sample Input:

Enter a number: 20

Expected Output:

3 6 9 12 15 18

Question 3: Calculate the Factorial of a Number

Problem Statement:

Write a Java program that asks the user for a number N and calculates the factorial of N using a for loop.

Sample Input:

Enter a number: 5

Expected Output:

Factorial of 5 is 120

Question 4: Print Even Numbers from 1 to N

Problem Statement:

Write a Java program that asks the user for a number N and prints all the even numbers from 1 to N using a for loop.

Sample Input:

Enter a number: 10

Expected Output:

2 4 6 8 10

Question 5: Sum of Odd Numbers between 1 and N

Problem Statement:

Write a Java program that asks the user for a number N and calculates the sum of all odd numbers between 1 and N using a for loop.

Sample Input:

Enter a number: 10

Expected Output:

The sum of odd numbers from 1 to 10 is: 25

Question 6: Print All Elements of an Array

Problem Statement:

Write a Java program that uses a **for-each** loop to print all elements of an integer array. The program should ask the user to input 5 integers, store them in an array, and then print all the elements using a **for-each** loop.

Sample Input:

Enter 5 integers: 3 7 12 5 8

Expected Output:

3 7 12 5 8

Question 7: Find the Sum of All Elements in an Array

Problem Statement:

Write a Java program that uses a **for-each** loop to calculate the sum of all elements in a given integer array. The program should ask the user to input 5 integers, store them in an array, and then compute the sum of these numbers using the **for-each** loop.

Sample Input:

Enter 5 integers: 4 6 8 2 10

Expected Output:

The sum of all numbers is: 30

Question 8: Print All Names in a String Array

Problem Statement:

Write a Java program that uses a **for-each** loop to print all the names stored in a String array. The program should ask the user to input 4 names, store them in an array, and then print each name using the **for-each** loop.

Sample Input:

Enter 4 names: Manoj Aditya Shilbhushan Shweta

Expected Output:

Manoj
Aditya
Shilbhushan
Shweta

Question 9: Find the Largest Element in an Array

Problem Statement:

Write a Java program that asks the user to input 5 integers, stores them in an array, and then finds and prints the largest element in the array. (Explore in-built method to solve this)

Sample Input:

Enter 5 integers: 12 45 67 23 89

Expected Output:

The largest element is: 89

Question 10: Find the Average of Elements in an Array

Problem Statement:

Write a Java program that asks the user to input 5 integers, stores them in an array, and then calculates and prints the average of the elements in the array.

Sample Input:

Enter 5 integers: 10 20 30 40 50

Expected Output:

The average of the numbers is: 30.0

Question 11: Count Positive and Negative Numbers in an Array

Problem Statement:

Write a Java program that asks the user to input 6 integers, stores them in an array, and then counts how many positive and negative numbers are present in the array.

Sample Input:

Enter 6 integers: -5 3 7 -2 0 8

Expected Output:

Positive numbers: 3

Negative numbers: 2

Question 12: Sort an Array in Ascending Order

Problem Statement:

Write a Java program that asks the user to input 5 integers, stores them in an array, and then sorts the array in ascending order using the Arrays.sort() method. After sorting, print the sorted array.

Sample Input:

Enter 5 integers: 12 45 23 8 90

Expected Output:

Sorted array: 8 12 23 45 90

Question 13: Check if an Array Contains a Specific Element

Problem Statement:

Write a Java program that asks the user to input 5 integers, stores them in an array, and then checks whether a specific number (input by the user) is present in the array using the Arrays.asList() method. If the number is found, print "Found", otherwise print "Not Found".

Sample Input:

Enter 5 integers: 10 20 30 40 50

Enter the number to search: 30

Expected Output:

Found

Question 14: Find the Index of an Element in an Array

Problem Statement:

Write a Java program that asks the user to input 5 integers, stores them in an array, and then finds the index of a specific number (input by the user) using the `Arrays.binarySearch()` method. If the number is found, print the index, otherwise print "Not Found".

Sample Input:

Enter 5 integers: 5 10 15 20 25

Enter the number to search: 15

Expected Output:

The number 15 is found at index 2

Question 15: Write a program to print the following pattern:

```
1
2*2
3*3*3
4*4*4*4
5*5*5*5*5
5*5*5*5*5
4*4*4*4
3*3*3
2*2
```

Question 16: Write a program to print the following pattern:

```
1
1*2
1*2*3
1*2*3*4
1*2*3*4*5
```

Question 17: Write a program to print the following pattern:

```
1
1*3
1*3*5
1*3*5*7
1*3*5*7*9
```

Question 19: Write a program to print the following pattern:

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Question 19: Write a program to print the following pattern:

1
12
123
1234
12345

Question 20: Write a program to print the following pattern:

1
2 3
4 5 6
7 8 9 10
11 12 13 14 15

Question 21: Write a program to print the following pattern:

```

*****
*       *
*       *
*       *
*       *
*****

```

Question 22: Write a program to print the following pattern:

★
★★★
★★★★★
★★★★★★★
★★★★★★★★★
★★★★★★★★★★★
★★★★★★★★★★★★★
★★★★★★★★★★★★★
★★★★★★★★★★★
★★★★★★★
★★★
★

Question 23: Write a program to print the following pattern:

Question 24: Reverse a String

Problem Statement:

Write a Java program that asks the user for a string and then prints the reverse of that string.

Sample Input:

Enter a string: hello

Expected Output:

Reversed string: olleh

Question 25: Count Vowels in a String

Problem Statement:

Write a Java program that asks the user for a string and counts the number of vowels (a, e, i, o, u) in the string. The program should then print the total number of vowels.

Sample Input:

Enter a string: programming

Expected Output:

The number of vowels in 'programming' is: 3

Question 26: Check if a String is a Palindrome

Problem Statement:

Write a Java program that asks the user for a string and checks whether the string is a palindrome. A palindrome is a string that reads the same backward as forward (ignoring spaces and punctuation).

Sample Input:

Enter a string: madam

Expected Output:

The string 'madam' is a palindrome.

Question 27: String Literal and Object Creation

Problem Statement:

Write a Java program that creates two string variables using string literals with the same content. Then, print whether both variables point to the same object.

Code Example:

```
String str1 = "hello";  
String str2 = "hello";
```

Expected Output:

Both variables point to the same object: true

Question 28: String Creation with new Keyword

Problem Statement:

Write a Java program that creates two string objects using the new keyword with the same content. Then, print whether both objects are the same using the == operator and the .equals() method.

Code Example:

```
String str1 = new String("hello");  
String str2 = new String("hello");
```

Expected Output:

Using == : false

Using .equals(): true

Question 29: String Concatenation and Object Creation

Problem Statement:

Write a Java program that concatenates two strings using the + operator. Print whether the concatenated string is a new object or a reference to an existing string object using the == operator.

Code Example:

```
String str1 = "hello";  
String str2 = "world";  
String str3 = str1 + str2;
```

Expected Output:

Is str3 pointing to the same object as str1? false

Question 30: String Pool with intern() Method

Problem Statement:

Write a Java program that creates a string using the new keyword and then calls the intern() method. Print whether the interned string is pointing to the same object as the original string literal.

Code Example:

```
String str1 = new String("hello");  
String str2 = str1.intern();  
String str3 = "hello";
```

Expected Output:

Is str2 and str3 pointing to the same object? true

Question 31: Multiple String Literals with Same Content

Problem Statement:

Write a Java program that declares three string literals with the same content and prints whether all three strings refer to the same object using the == operator.

Code Example:

```
String str1 = "java";  
String str2 = "java";  
String str3 = "java";
```

Expected Output:

All strings point to the same object: true

More Pattern (to build more logic-If you get extra time, toh hi karna):<https://www.geeksforgeeks.org/java/java-pattern-programs/>

NOTE: CONGRATULATIONS WHO COMPLETED THIS..

(If you completed this complete assignment - Write in the whatsapp group “Yeh Dil Mange More”)