C-DAC Mumbai
Lab Assignment

Question 1: Print Numbers from 1 to N

Problem Statement:

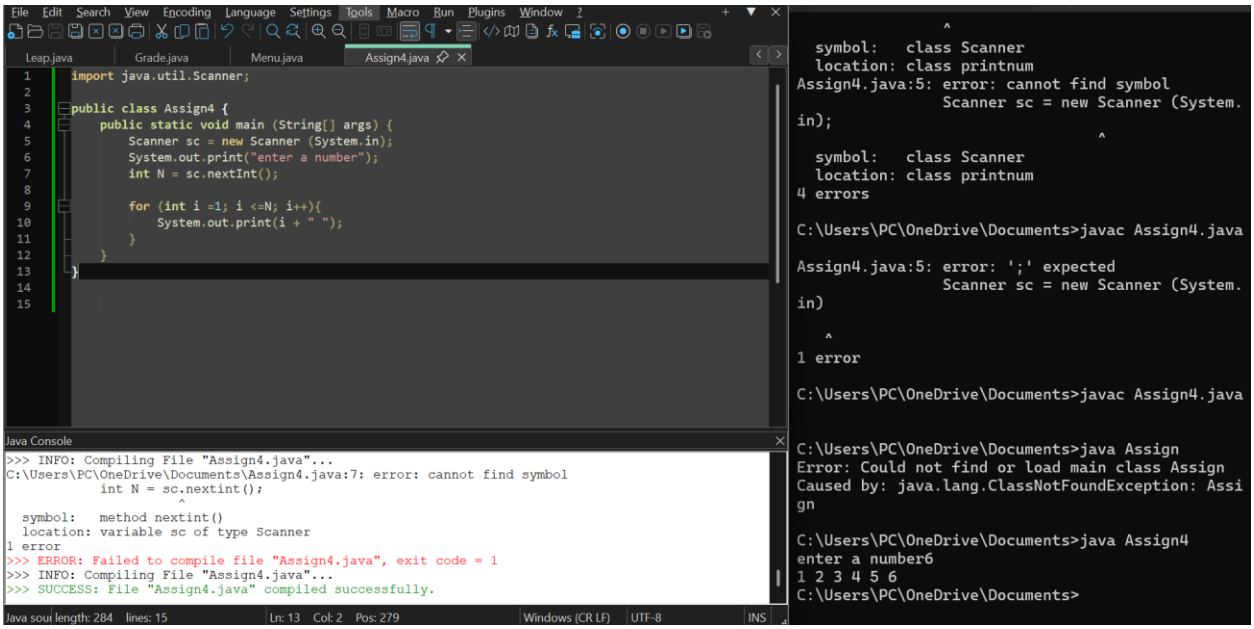
Write a Java program that asks the user for a number N and then prints the numbers from 1 to N using a for loop.

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:

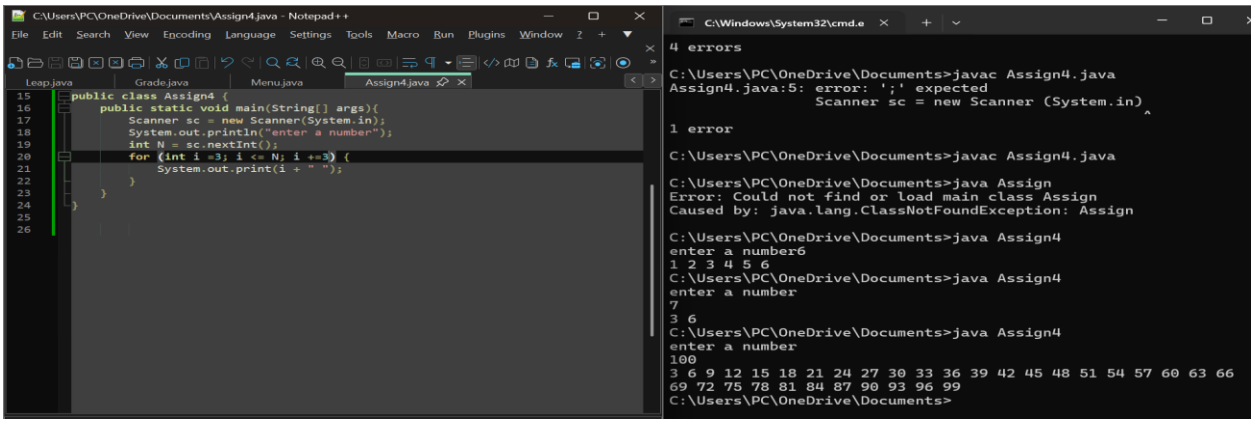
Write a Java program that asks the user for a number N and prints all the multiples of 3 between 1 and N using a for loop.

Sample Input:

Enter a number: 20

Expected Output:

3 6 9 12



Question 3: Calculate the Factorial of a Number

Problem Statement:

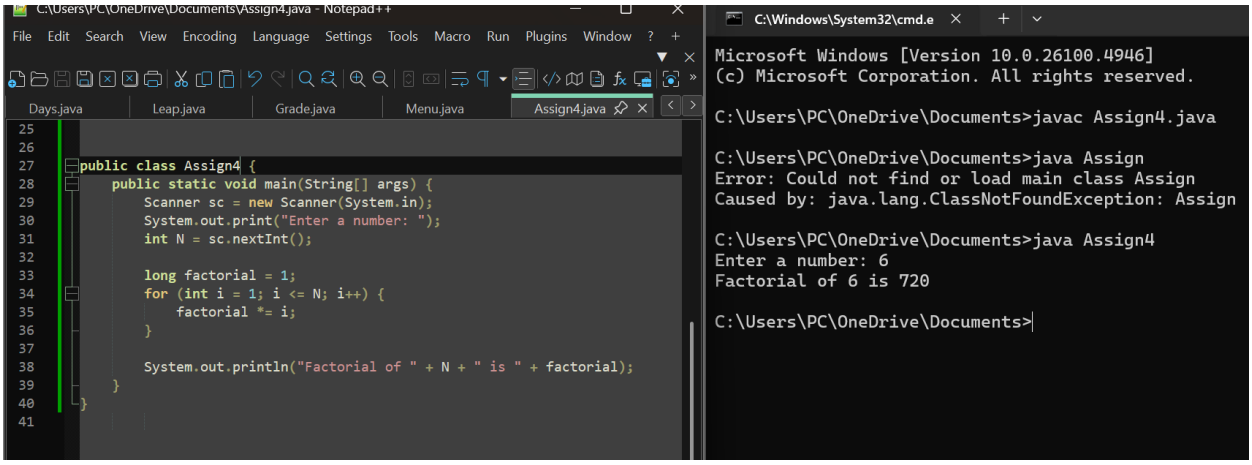
Write a Java program that asks the user for a number N and calculates the factorial of N using a for loop.

Sample Input:

Enter a number: 5

Expected Output:

Factorial of 5 is 120



Question 4: Print Even Numbers from 1 to N

Problem Statement:

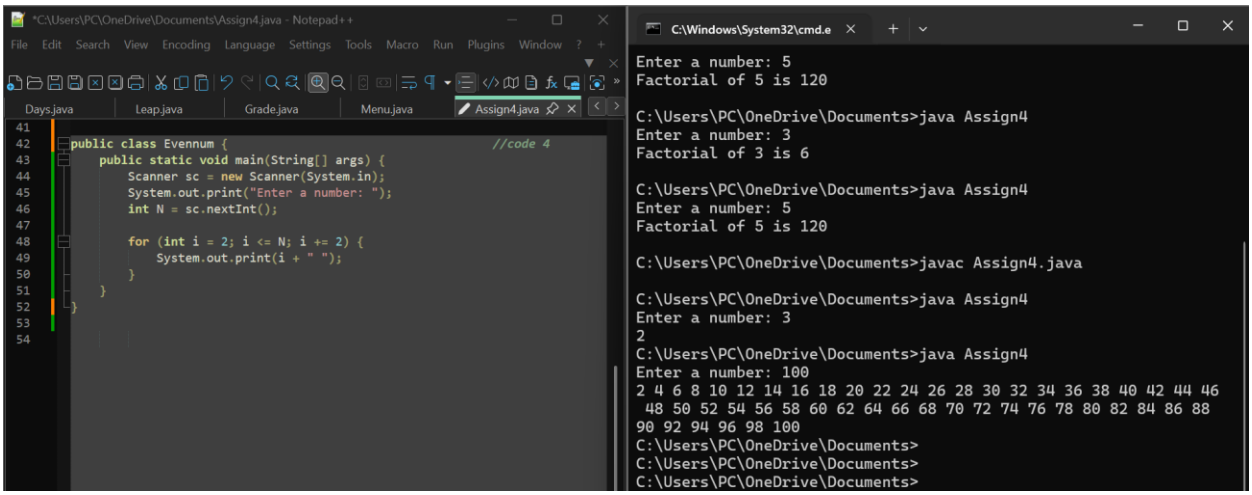
Write a Java program that asks the user for a number N and prints all the even numbers from 1 to N using a for loop.

Sample Input:

Enter a number: 10

Expected Output:

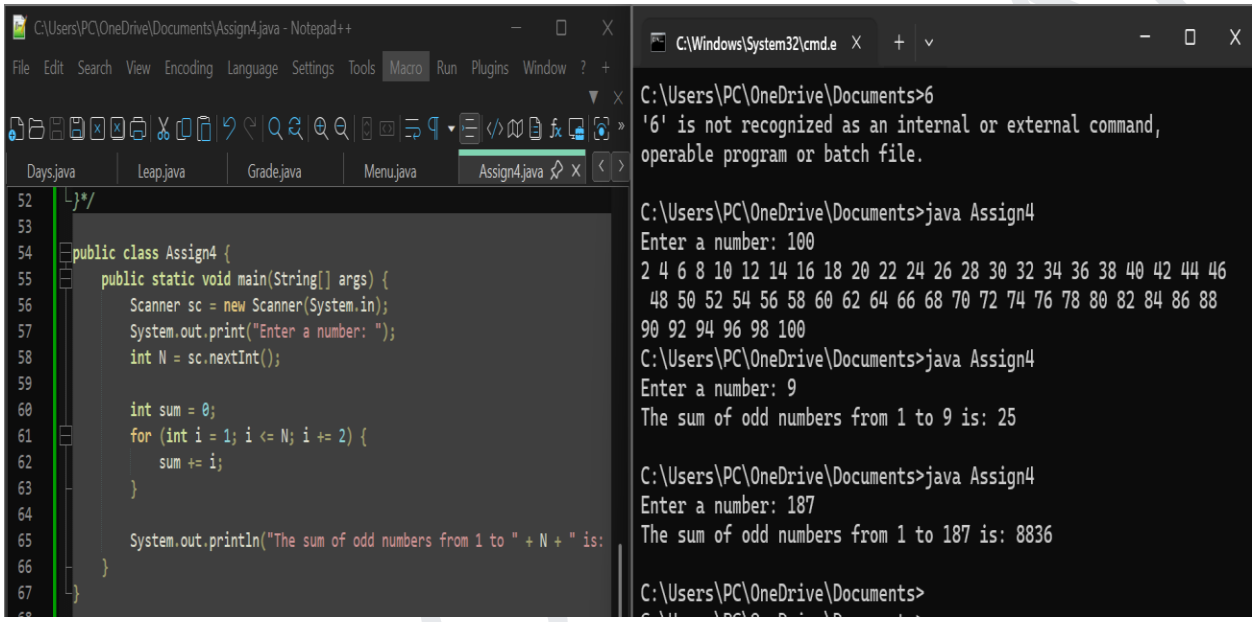
2 4 6 8 10



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

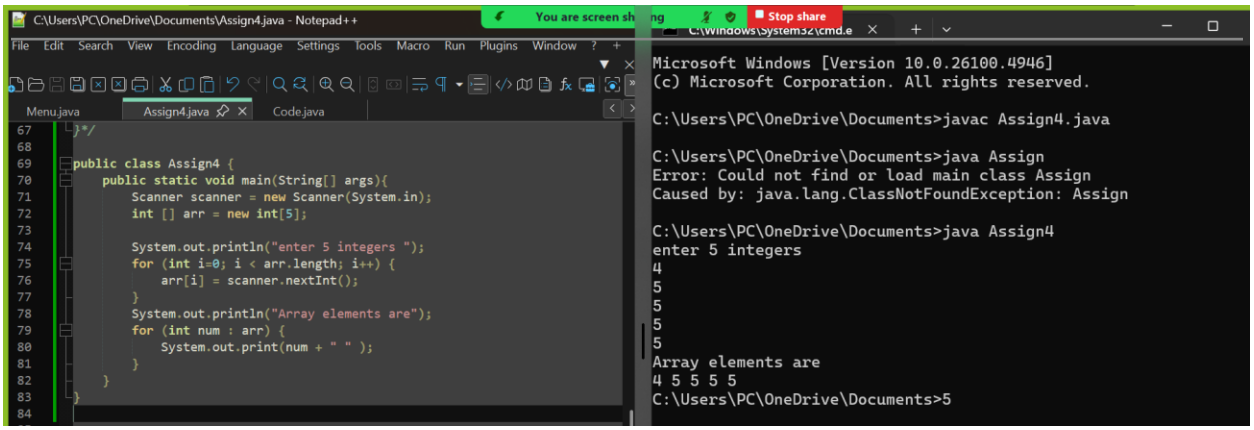
Expected Output:
The sum of odd numbers from 1 to 10 is: 25



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:

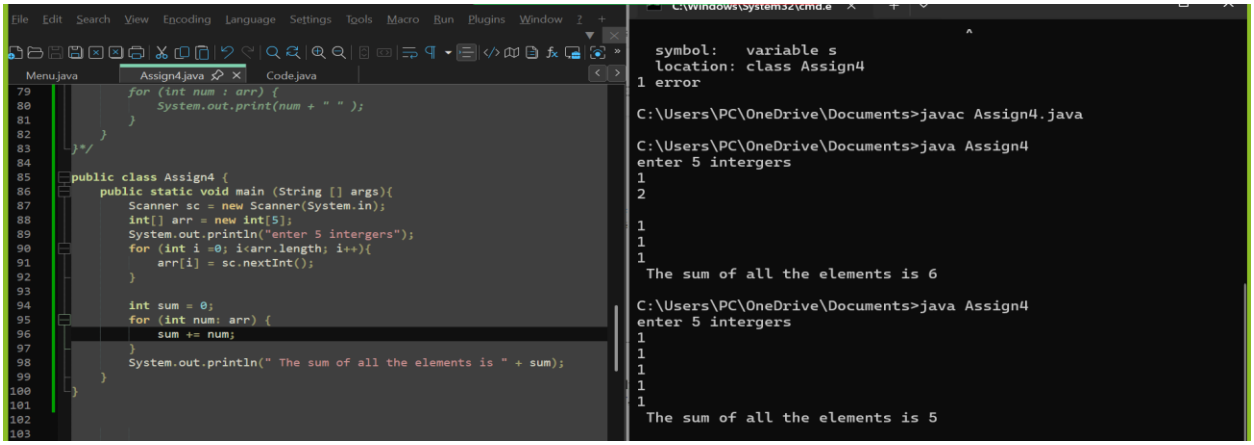
Write a Java program that uses a **for-each** loop to calculate the sum of all elements in a given integer array. The program should ask the user to input 5 integers, store them in an array, and then compute the sum of these numbers using the **for-each** loop.

Sample Input:

Enter 5 integers: 4 6 8 2 10

Expected Output:

The sum of all numbers is: 30



```
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ? +
Menu.java | Assign4.java | Code.java

79          for (int num : arr) {
80              System.out.print(num + " " );
81          }
82      }
83  }*/
84
85  public class Assign4 {
86      public static void main (String [] args){
87          Scanner sc = new Scanner(System.in);
88          int[] arr = new int[5];
89          System.out.println("enter 5 intergers");
90          for (int i =0; i<arr.length; i++){
91              arr[i] = sc.nextInt();
92          }
93
94          int sum = 0;
95          for (int num: arr) {
96              sum += num;
97          }
98          System.out.println(" The sum of all the elements is " + sum);
99      }
100 }
101
102
103
```

```
  symbol:   variable s
  location: class Assign4
1 error

C:\Users\PC\OneDrive\Documents>javac Assign4.java

C:\Users\PC\OneDrive\Documents>java Assign4
enter 5 intergers
1
2


1
1
1
 The sum of all the elements is 6

C:\Users\PC\OneDrive\Documents>java Assign4
enter 5 intergers
1
1
1
1
1
 The sum of all the elements is 5
```

Question 8: Print All Names in a String Array

Problem Statement:

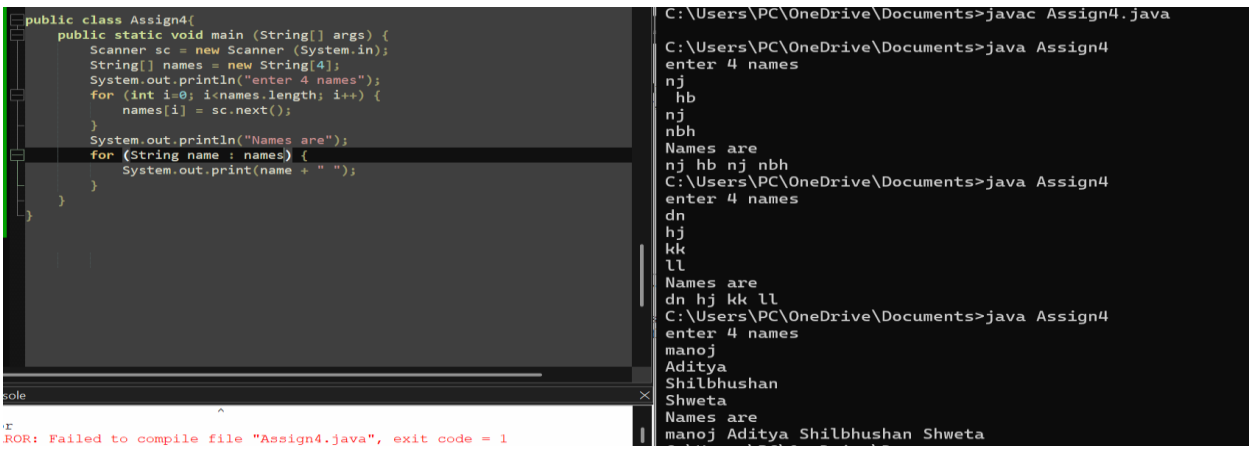
Write a Java program that uses a **for-each** loop to print all the names stored in a String array. The program should ask the user to input 4 names, store them in an array, and then print each name using the **for-each** loop.

Sample Input:

Enter 4 names: Manoj Aditya Shilbhushan Shweta

Expected Output:

Manoj
Aditya
Shilbhushan
Shweta



```
public class Assign4{
    public static void main (String[] args) {
        Scanner sc = new Scanner (System.in);
        String[] names = new String[4];
        System.out.println("enter 4 names");
        for (int i=0; i<names.length; i++) {
            names[i] = sc.next();
        }
        System.out.println("Names are");
        for (String name : names) {
            System.out.print(name + " ");
        }
    }
}
```

```
sole
ROR: Failed to compile file "Assign4.java", exit code = 1
```

```
C:\Users\PC\OneDrive\Documents>javac Assign4.java

C:\Users\PC\OneDrive\Documents>java Assign4
enter 4 names
nj
 hb
nj
nbh
Names are
nj hb nj nbh
C:\Users\PC\OneDrive\Documents>java Assign4
enter 4 names
dn
hj
kk
ll
Names are
dn hj kk ll
C:\Users\PC\OneDrive\Documents>java Assign4
enter 4 names
manoj
Aditya
Shilbhushan
Shweta
Names are
manoj Aditya Shilbhushan Shweta
```

Question 9: Find the Largest Element in an Array

Problem Statement:

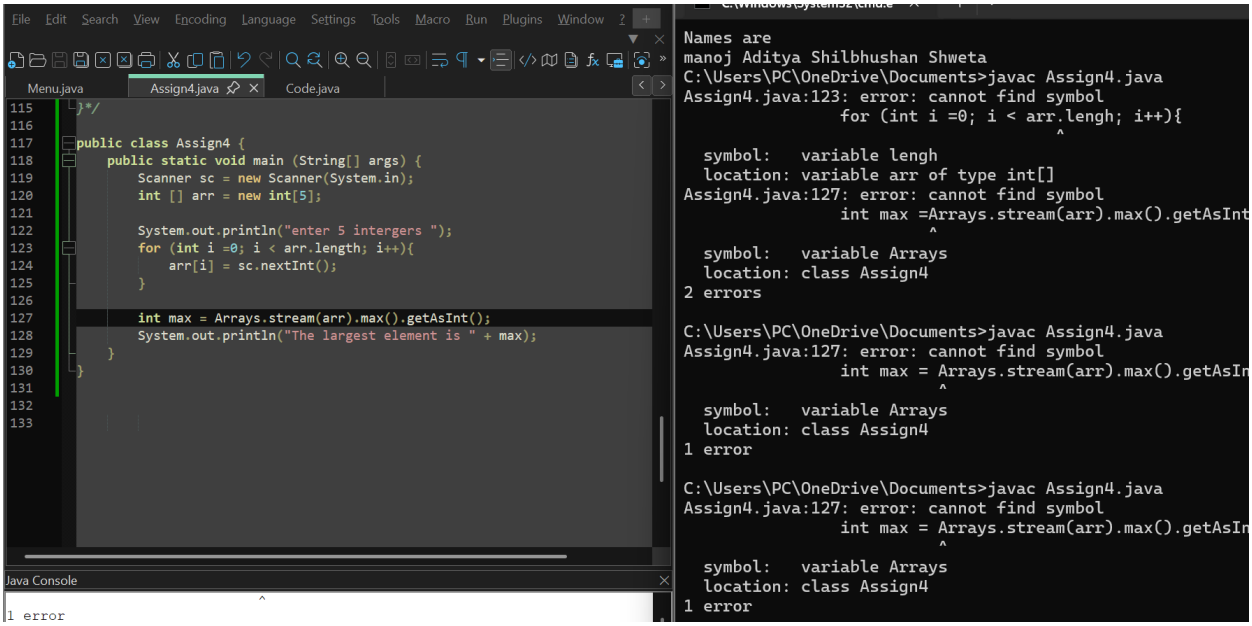
Write a Java program that asks the user to input 5 integers, stores them in an array, and then finds and prints the largest element in the array. (Explore in-built method to solve this)

Sample Input:

Enter 5 integers: 12 45 67 23 89

Expected Output:

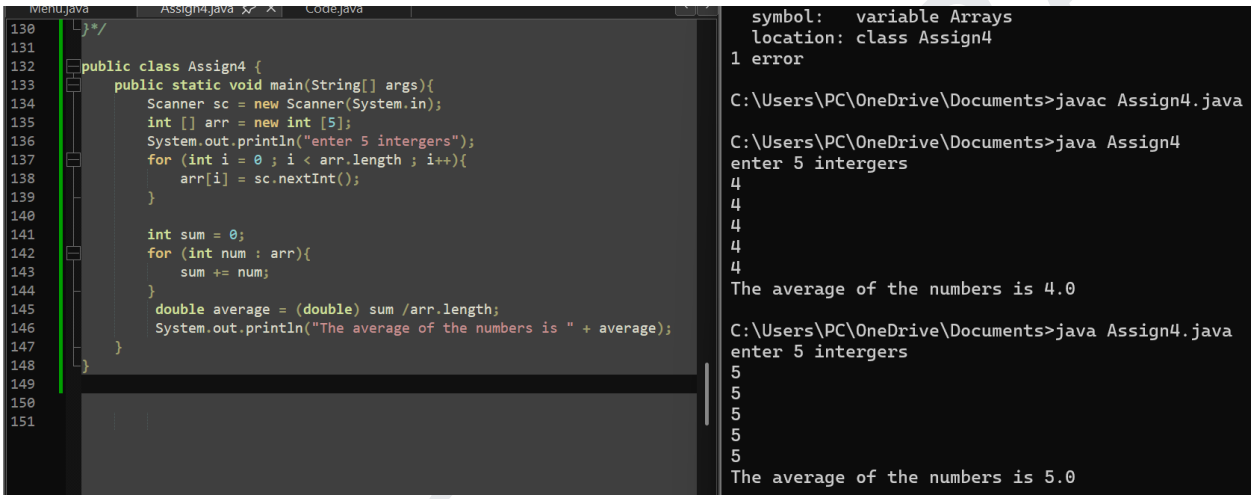
The largest element is: 89



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

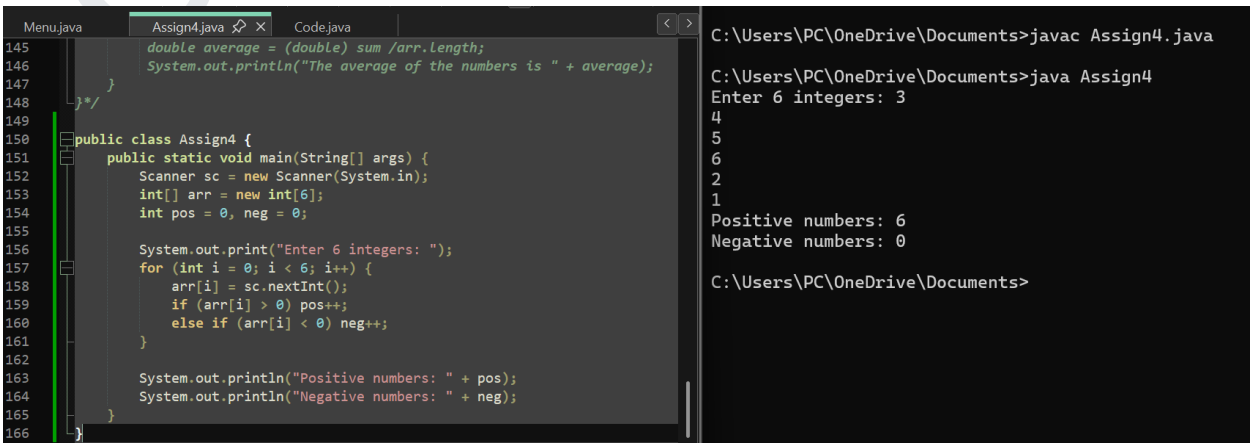


```
}*/

public class Assign4 {
    public static void main(String[] args){
        Scanner sc = new Scanner(System.in);
        int [] arr = new int [5];
        System.out.println("enter 5 intergers");
        for (int i = 0 ; i < arr.length ; i++){
            arr[i] = sc.nextInt();
        }

        int sum = 0;
        for (int num : arr){
            sum += num;
        }
         double average = (double) sum /arr.length;
         System.out.println("The average of the numbers is " + average);
    }
}
```

```
  symbol:   variable Arrays
  location: class Assign4
1 error

C:\Users\PC\OneDrive\Documents>javac Assign4.java

C:\Users\PC\OneDrive\Documents>java Assign4
enter 5 intergers
4
4
4
4
4
The average of the numbers is 4.0

C:\Users\PC\OneDrive\Documents>java Assign4.java
enter 5 intergers
5
5
5
5
5
The average of the numbers is 5.0
```

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



```
Menu.java   Assign4.java   Code.java
        double average = (double) sum /arr.length;
        System.out.println("The average of the numbers is " + average);
    }
}*/

public class Assign4 {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int[] arr = new int[6];
        int pos = 0, neg = 0;

        System.out.print("Enter 6 integers: ");
        for (int i = 0; i < 6; i++) {
            arr[i] = sc.nextInt();
            if (arr[i] > 0) pos++;
            else if (arr[i] < 0) neg++;
        }

        System.out.println("Positive numbers: " + pos);
        System.out.println("Negative numbers: " + neg);
    }
}
```

```
C:\Users\PC\OneDrive\Documents>javac Assign4.java

C:\Users\PC\OneDrive\Documents>java Assign4
Enter 6 integers: 3
4
5
6
2
1
Positive numbers: 6
Negative numbers: 0

C:\Users\PC\OneDrive\Documents>
```

Question 12: Sort an Array in Ascending Order

Problem Statement:

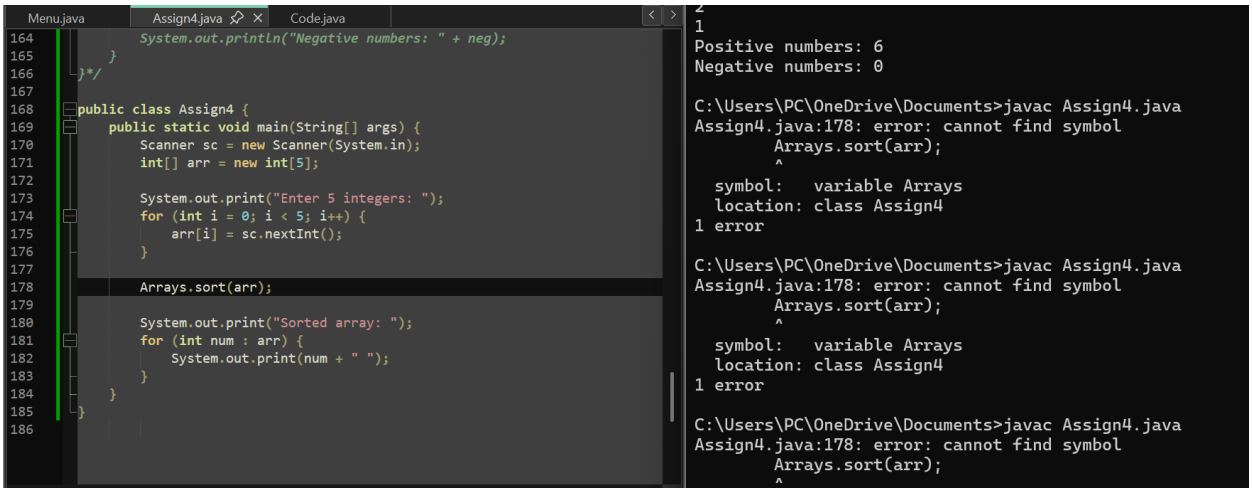
Write a Java program that asks the user to input 5 integers, stores them in an array, and then sorts the array in ascending order using the Arrays.sort() method. After sorting, print the sorted array.

Sample Input:

Enter 5 integers: 12 45 23 8 90

Expected Output:

Sorted array: 8 12 23 45 90



```
        System.out.println("Negative numbers: " + neg);
    }
}*/

public class Assign4 {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int[] arr = new int[5];

        System.out.print("Enter 5 integers: ");
        for (int i = 0; i < 5; i++) {
            arr[i] = sc.nextInt();
        }

        Arrays.sort(arr);

        System.out.print("Sorted array: ");
        for (int num : arr) {
            System.out.print(num + " ");
        }
    }
}
```

```
2
1
Positive numbers: 6
Negative numbers: 0

C:\Users\PC\OneDrive\Documents>javac Assign4.java
Assign4.java:178: error: cannot find symbol
        Arrays.sort(arr);
        ^
  symbol:   variable Arrays
  location: class Assign4
1 error

C:\Users\PC\OneDrive\Documents>javac Assign4.java
Assign4.java:178: error: cannot find symbol
        Arrays.sort(arr);
        ^
  symbol:   variable Arrays
  location: class Assign4
1 error

C:\Users\PC\OneDrive\Documents>javac Assign4.java
Assign4.java:178: error: cannot find symbol
        Arrays.sort(arr);
        ^
```

Question 13: Check if an Array Contains a Specific Element

Problem Statement:

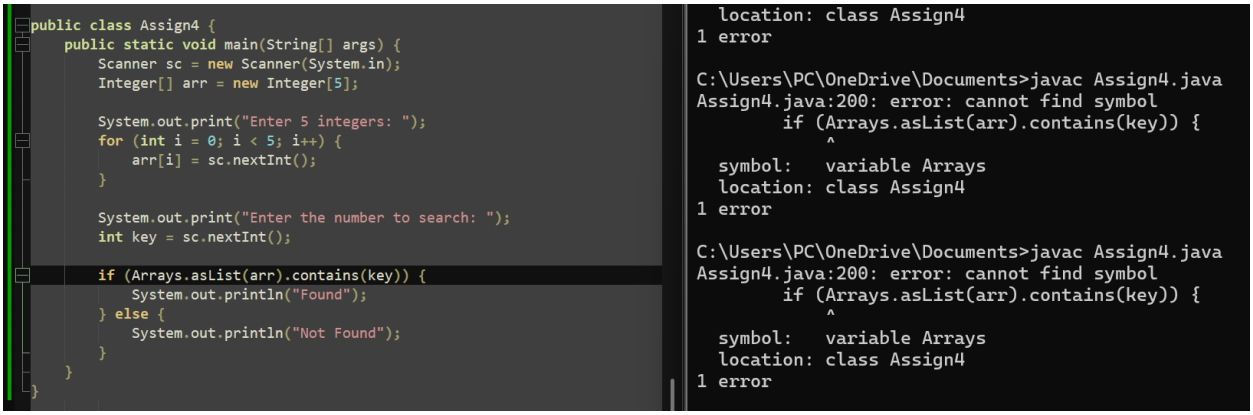
Write a Java program that asks the user to input 5 integers, stores them in an array, and then checks whether a specific number (input by the user) is present in the array using the Arrays.asList() method. If the number is found, print "Found", otherwise print "Not Found".

Sample Input:

Enter 5 integers: 10 20 30 40 50
Enter the number to search: 30

Expected Output:

Found



```
public class Assign4 {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        Integer[] arr = new Integer[5];

        System.out.print("Enter 5 integers: ");
        for (int i = 0; i < 5; i++) {
            arr[i] = sc.nextInt();
        }

        System.out.print("Enter the number to search: ");
        int key = sc.nextInt();

        if (Arrays.asList(arr).contains(key)) {
            System.out.println("Found");
        } else {
            System.out.println("Not Found");
        }
    }
}
```

```
  location: class Assign4
1 error

C:\Users\PC\OneDrive\Documents>javac Assign4.java
Assign4.java:200: error: cannot find symbol
        if (Arrays.asList(arr).contains(key)) {
            ^
  symbol:   variable Arrays
  location: class Assign4
1 error

C:\Users\PC\OneDrive\Documents>javac Assign4.java
Assign4.java:200: error: cannot find symbol
        if (Arrays.asList(arr).contains(key)) {
            ^
  symbol:   variable Arrays
  location: class Assign4
1 error
```

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

```java
import java.util.Arrays;
public class Assign4 {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int[] arr = new int[5];

        System.out.print("Enter 5 integers: ");
        for (int i = 0; i < 5; i++) {
            arr[i] = sc.nextInt();
        }

        Arrays.sort(arr); // binarySearch requires sorted array

        System.out.print("Enter the number to search: ");
        int key = sc.nextInt();

        int index = Arrays.binarySearch(arr, key);

        if (index >= 0) {
            System.out.println("The number " + key + " is found at index "
        } else {
            System.out.println("Not Found");
        }
```

```
.on: class Assign4

)R: Failed to compile file "Assign4.java", exit code = 1
```

```
2
Enter the number to search: 4
Not Found

C:\Users\PC\OneDrive\Documents>java Assign4
Enter 5 integers:
1
1
1
1

1
Enter the number to search: 2
Not Found

C:\Users\PC\OneDrive\Documents>java Assign4
Enter 5 integers:
1
2
3
4
5
Enter the number to search: 2
The number 2 is found at index 1
```

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
```

```java
public class Assign4 {                                  //code 15
    public static void main(String[] args) {
        int n = 5;

        // Increasing part
        for (int i = 1; i <= n; i++) {
            for (int j = 1; j <= i; j++) {
                System.out.print(i);
                if (j < i) System.out.print("*");
            }
            System.out.println();
        }

        // Decreasing part
        for (int i = n; i >= 2; i--) {
            for (int j = 1; j <= i; j++) {
                System.out.print(i);
                if (j < i) System.out.print("*");
            }
            System.out.println();
        }
    }
```

```
OR: Failed to compile file "Assign4.java", exit code = 1
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```

```
4*4*4*4
3*3*3
2*2

C:\Users\PC\OneDrive\Documents>java Assign4
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

C:\Users\PC\OneDrive\Documents>java Assign4
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
```

```java
public class Assign4 {
    public static void main(String[] args) {
        int n = 5;

        for (int i = 1; i <= n; i++) {
            for (int j = 1; j <= i; j++) {
                System.out.print(j);
                if (j < i) {
                    System.out.print("*");
                }
            }
            System.out.println();
        }
    }
}
```

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

C:\Users\PC\OneDrive\Documents>java Assign4
1
1*2
1*2*3
1*2*3*4
1*2*3*4*5

C:\Users\PC\OneDrive\Documents>java Assign4
```

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
```

```java
public class Assign4 {
    public static void main(String[] args) {
        int n = 5;  // number of rows

        for (int i = 1; i <= n; i++) {
            int num = 1;
            for (int j = 1; j <= i; j++) {
                System.out.print(num);
                if (j < i) {
                    System.out.print("*");
                }
                num += 2;  // move to next odd number
            }
            System.out.println();
        }
    }
}
```

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

C:\Users\PC\OneDrive\Documents>java Assign4
1
1*3
1*3*5
1*3*5*7
1*3*5*7*9

C:\Users\PC\OneDrive\Documents>java Assign4
1
1*3
1*3*5
1*3*5*7
1*3*5*7*9
```

Question 18: Write a program to print the following pattern:

```
11111
22222
33333
44444
55555
```

```java
public class Assign4 {                          //code18
    public static void main(String[] args) {
        int n = 5;  // number of rows and columns

        for (int i = 1; i <= n; i++) {
            for (int j = 1; j <= n; j++) {
                System.out.print(i);
            }
            System.out.println();
        }
    }
}
```

```
44444
55555

C:\Users\PC\OneDrive\Documents>java Assign4
11111
22222
33333
44444
55555

C:\Users\PC
```

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

```
1
22
333
4444
55555
```

```java
public class Assign4 {                                  //code19
    public static void main(String[] args) {
        int n = 5;  // number of rows

        for (int i = 1; i <= n; i++) {
            for (int j = 1; j <= i; j++) {
                System.out.print(i);
            }
            System.out.println();
        }
    }
}
```

```
C:\Users\PC\OneDrive\Documents>java Assign4
1
22
333
4444
55555

C:\Users\PC\OneDrive\Documents>java Assign4
1
22
333
4444
55555
```

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

```
1
12
123
1234
12345
```

```java
public class IncreasingTrianglePattern {
    public static void main(String[] args) {
        int n = 5;  // number of rows

        for (int i = 1; i <= n; i++) {
            for (int j = 1; j <= i; j++) {
                System.out.print(j);
            }
            System.out.println();
        }
    }
}
```

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

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

```java
public class ContinuousNumberTriangle {
    public static void main(String[] args) {
        int n = 5;  // number of rows
        int num = 1;

        for (int i = 1; i <= n; i++) {
            for (int j = 1; j <= i; j++) {
                System.out.print(num + " ");
                num++;
            }
            System.out.println();
        }
    }
}
```

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

```
******
*    *
*    *
*    *
*    *
******
```

```java
public class DPattern {                                    //code22
    public static void main(String[] args) {
        int height = 7;  // total rows
        int width = 6;   // total columns

        for (int i = 0; i < height; i++) {
            for (int j = 0; j < width; j++) {
                if (i == 0 || i == height - 1) {
                    System.out.print("*");
                }
                else if (j == 0) {
                    System.out.print("*");
                }
                else if (j == width - 1 && i != 0 && i != height - 1) {
                    System.out.print("*");
                }
                else {
                    System.out.print(" ");
                }
            }
            System.out.println();
        }
    }
}
```

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

```java
public class DiamondPattern {                              //code23
    public static void main(String[] args) {
        int n = 5; // height of upper half (you can change it)

        for (int i = 1; i <= n; i++) {
            for (int j = i; j < n; j++) {
                System.out.print(" ");
            }
            for (int j = 1; j <= (2 * i - 1); j++) {
                System.out.print("*");
            }
            System.out.println();
        }

        for (int i = n - 1; i >= 1; i--) {
            for (int j = n; j > i; j--) {
                System.out.print(" ");
            }
            for (int j = 1; j <= (2 * i - 1); j++) {
                System.out.print("*");
            }
            System.out.println();
        }
    }
}
```

```
    *
   ***
  *****
 *******
*********
***********
*********
 *******
  *****
   ***
    *
```

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

```java
public class ReverseString {                                    //code24
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a string: ");
        String str = sc.nextLine();
        String reversed = "";
        for (int i = str.length() - 1; i >= 0; i--) {
            reversed += str.charAt(i);
        }
        System.out.println("Reversed string: " + reversed);

        sc.close();
    }
}
```

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

```java
public class CountVowels {                                      //code25
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a string: ");
        String str = sc.nextLine();
        int count = 0;
        str = str.toLowerCase(); // convert to lowercase for easy comparison
        for (int i = 0; i < str.length(); i++) {
            char ch = str.charAt(i);
            if (ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u') {
                count++;
            }
        }
        System.out.println("The number of vowels in '" + str + "' is: " + count);

        sc.close();
    }
}
```

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.

```java
public class PalindromeCheck {                                  //code26
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a string: ");
        String str = sc.nextLine();
        String cleanStr = str.toLowerCase().replaceAll("[^a-z0-9]", "");
        String reversed = new StringBuilder(cleanStr).reverse().toString();
        if (cleanStr.equals(reversed)) {
            System.out.println("The string '" + str + "' is a palindrome.");
        } else {
            System.out.println("The string '" + str + "' is not a palindrome.");
        }

        sc.close();
    }
}
```

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

```java
public class StringLiteralExample {                                  //code27
    public static void main(String[] args) {
        String str1 = "hello";
        String str2 = "hello";
        boolean result = (str1 == str2);

        System.out.println("Both variables point to the same object: " + result);
    }
}
```

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

```java
public class StringObjectExample {                                    //code28
    public static void main(String[] args) {
        String str1 = new String("hello");
        String str2 = new String("hello");
        System.out.println("Using == : " + (str1 == str2));
        System.out.println("Using .equals(): " + str1.equals(str2));
    }
}
```

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

```java
public class StringConcatenationExample {                             //code29
    public static void main(String[] args) {
        String str1 = "hello";
        String str2 = "world";
        String str3 = str1 + str2;
        System.out.println("Is str3 pointing to the same object as str1? " + (str3 == str1));
        System.out.println("Concatenated String (str3): " + str3);
    }
}
```

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

```java
public class StringInternExample {                                    //code30
    public static void main(String[] args) {
        String str1 = new String("hello");
        String str2 = str1.intern();
        String str3 = "hello";
        System.out.println("Is str2 and str3 pointing to the same object? " + (str2 == str3));
    }
}
```

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

```java
public class StringLiteralPoolExample {                          //code31
    public static void main(String[] args) {
        String str1 = "java";
        String str2 = "java";
        String str3 = "java";
        boolean result = (str1 == str2) && (str2 == str3);

        System.out.println("All strings point to the same object: " + result);
    }
}
```

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")