

Course Code: CSE-2340

Course Title: Software Development 1 (SD1).

Experiment Name: SD1_LabTask1_JavaBasics.

A..Setup Steps for Java IDE

i.Download and Install JDK

- Went to the Oracle JDK download page
- Downloaded the latest Java Development Kit (JDK) for Windows.
- Installed it by following the setup wizard.

ii.Set Environment Variables (if needed)

- Verified that JAVA_HOME was set automatically by the installer.
- Checked installation by opening Command Prompt and running:
- `java -version` → This displayed the installed Java version.

iii.Install NetBeans IDE

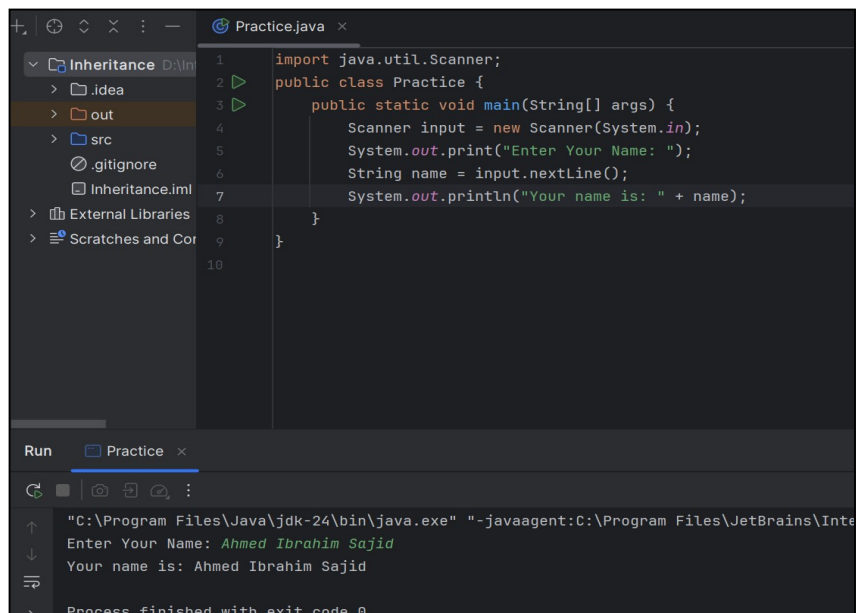
- Downloaded NetBeans IDE from the official website.
- Installed it and selected the JDK path during setup.
- Created a new Java project to confirm installation.

iv.Install IntelliJ IDEA (Community Edition)

- Downloaded IntelliJ IDEA from JetBrains website.
- Installed it with default settings.
- Configured IntelliJ to use the installed JDK.

v.Verify Installation

- Opened both NetBeans and IntelliJ.
- Created a simple Java program:



The screenshot shows the IntelliJ IDEA interface. On the left, the Project Explorer shows a project named 'Inheritance' with a 'src' folder. The main editor displays the code for 'Practice.java':

```
1 import java.util.Scanner;
2 public class Practice {
3     public static void main(String[] args) {
4         Scanner input = new Scanner(System.in);
5         System.out.print("Enter Your Name: ");
6         String name = input.nextLine();
7         System.out.println("Your name is: " + name);
8     }
9 }
10
```

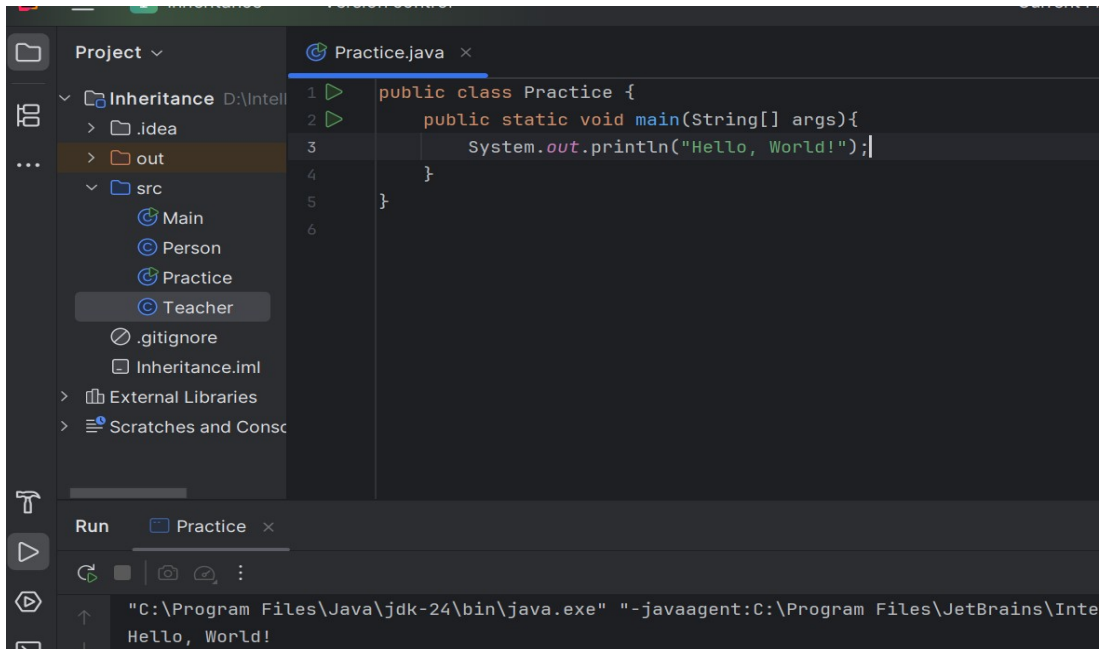
At the bottom, the Run console shows the execution of the program:

```
Run Practice
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition\lib\idea_rt.jar=5000:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition\bin" -Dfile.encoding=UTF-8
Enter Your Name: Ahmed Ibrahim Sajid
Your name is: Ahmed Ibrahim Sajid
Process finished with exit code 0
```

- Successfully ran the program and saw the output on the console

B. Codes:

1. It is a simple Java Code that print Hello World!

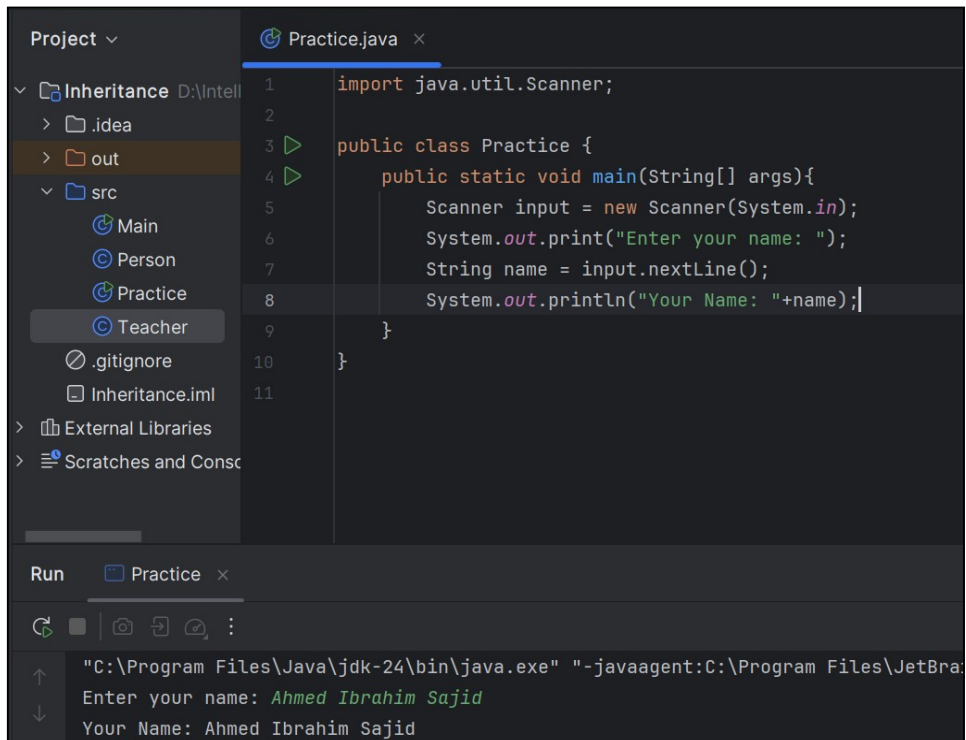


The screenshot shows an IDE with a project named 'Inheritance'. The 'src' folder contains files 'Main', 'Person', 'Practice', and 'Teacher'. The 'Practice.java' file is open, showing the following code:

```
1 public class Practice {  
2     public static void main(String[] args){  
3         System.out.println("Hello, World!");  
4     }  
5 }  
6
```

The Run console at the bottom shows the command: `"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA\bin\idea-agent.jar" -classpath D:\IntelliJ\Inheritance\out\classes Hello, World!`

2. It get input from user his name and print it.

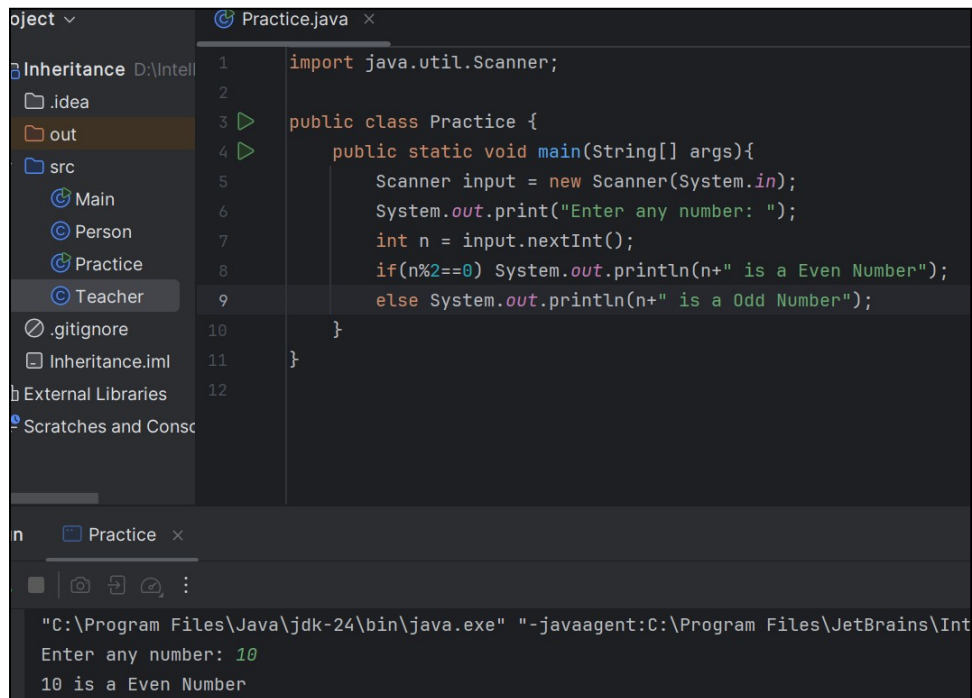


The screenshot shows the same IDE with the 'Practice.java' file open, showing the following code:

```
1 import java.util.Scanner;  
2  
3 public class Practice {  
4     public static void main(String[] args){  
5         Scanner input = new Scanner(System.in);  
6         System.out.print("Enter your name: ");  
7         String name = input.nextLine();  
8         System.out.println("Your Name: "+name);  
9     }  
10 }  
11
```

The Run console at the bottom shows the command: `"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA\bin\idea-agent.jar" -classpath D:\IntelliJ\Inheritance\out\classes Enter your name: Ahmed Ibrahim Sajid Your Name: Ahmed Ibrahim Sajid`

3. In this code it get a input from user and check it is Even or Odd number.



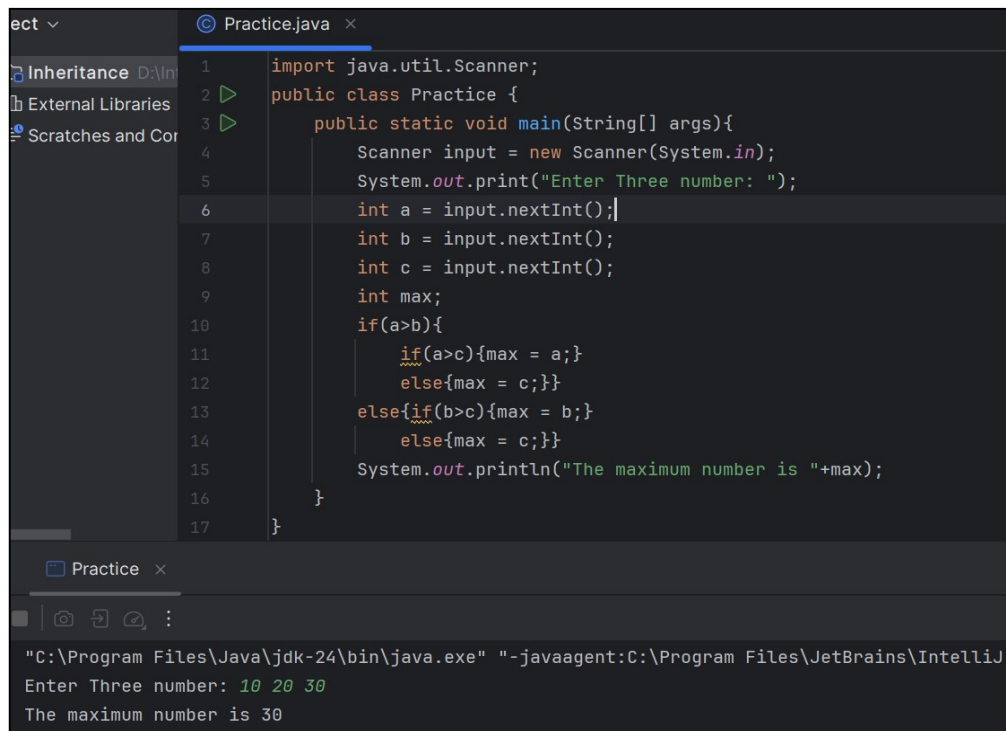
The screenshot shows an IDE with a project named 'Inheritance'. The 'src' folder contains files: 'Main', 'Person', 'Practice', and 'Teacher'. The 'Practice.java' file is open, showing the following code:

```
1 import java.util.Scanner;
2
3 public class Practice {
4     public static void main(String[] args){
5         Scanner input = new Scanner(System.in);
6         System.out.print("Enter any number: ");
7         int n = input.nextInt();
8         if(n%2==0) System.out.println(n+" is a Even Number");
9         else System.out.println(n+" is a Odd Number");
10    }
11 }
12
```

The console output shows the program execution:

```
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ
Enter any number: 10
10 is a Even Number
```

4. This program is for find the maximum number among 3 numbers.



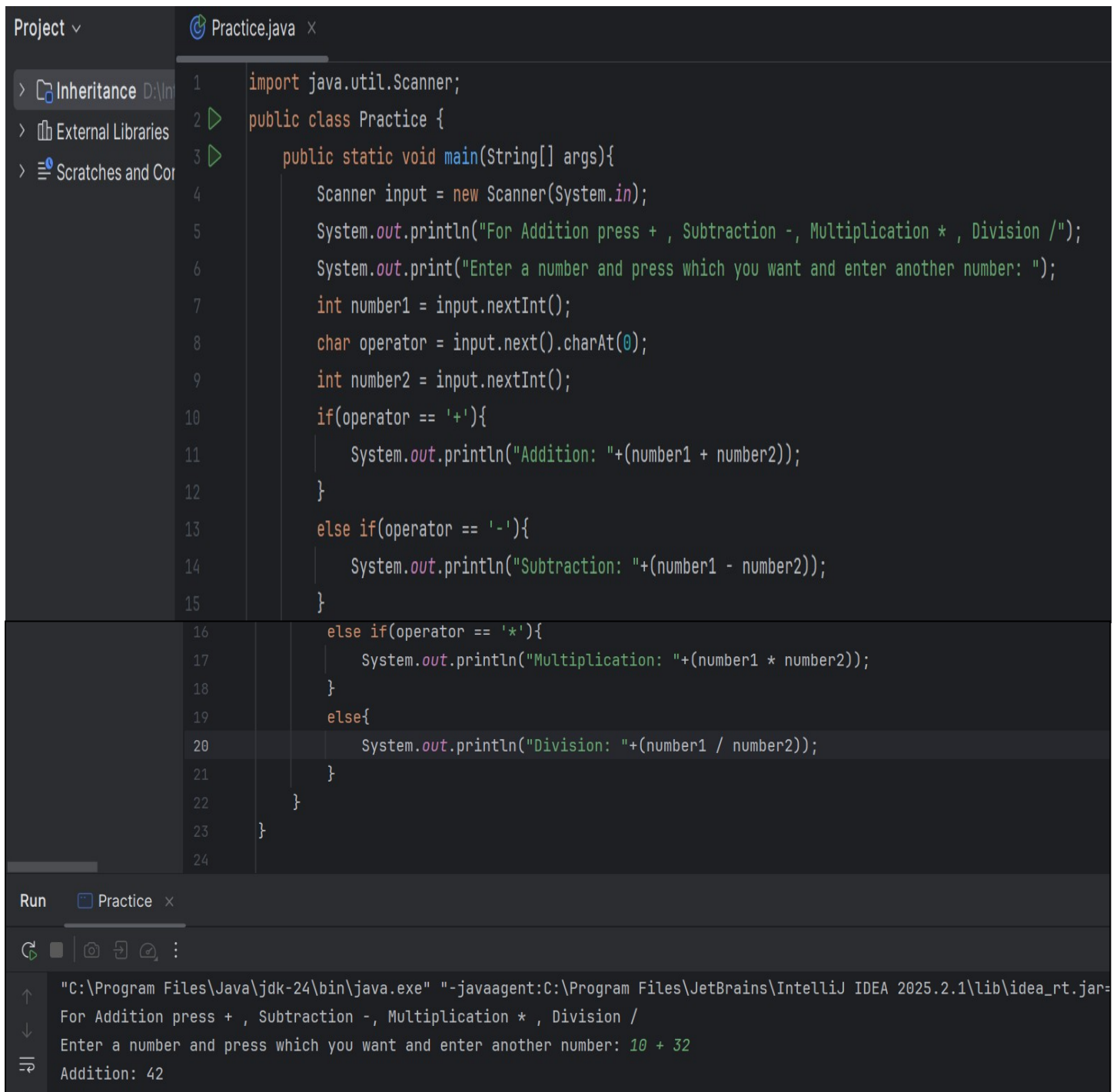
The screenshot shows the same IDE with the 'Practice.java' file open, showing the following code:

```
1 import java.util.Scanner;
2
3 public class Practice {
4     public static void main(String[] args){
5         Scanner input = new Scanner(System.in);
6         System.out.print("Enter Three number: ");
7         int a = input.nextInt();
8         int b = input.nextInt();
9         int c = input.nextInt();
10        int max;
11        if(a>b){
12            if(a>c){max = a;}
13            else{max = c;}
14        }
15        else{if(b>c){max = b;}
16            else{max = c;}
17        }
18        System.out.println("The maximum number is "+max);
19    }
20 }
```

The console output shows the program execution:

```
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ
Enter Three number: 10 20 30
The maximum number is 30
```

5. This program is for a simple Calculator.



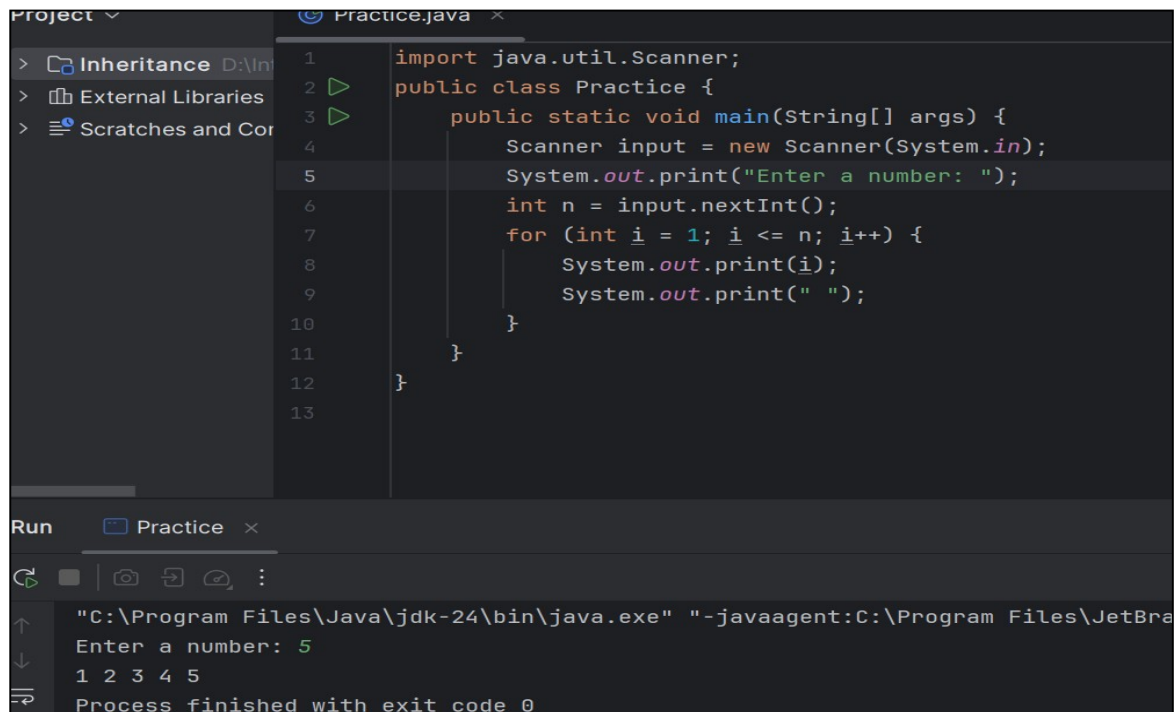
The screenshot displays the IntelliJ IDEA IDE interface. The top-left pane shows the project structure with 'Practice.java' selected. The main editor pane shows the code for 'Practice.java', which is a simple calculator program. The code imports 'java.util.Scanner', defines a 'Practice' class with a 'main' method, and uses 'Scanner' to take user input for two numbers and an operator. It then performs the calculation based on the operator and prints the result. The bottom pane shows the 'Run' output, which includes the command to run the program and the user's input '10 + 32', resulting in the output 'Addition: 42'.

```
1 import java.util.Scanner;
2 public class Practice {
3     public static void main(String[] args){
4         Scanner input = new Scanner(System.in);
5         System.out.println("For Addition press + , Subtraction - , Multiplication * , Division /");
6         System.out.print("Enter a number and press which you want and enter another number: ");
7         int number1 = input.nextInt();
8         char operator = input.next().charAt(0);
9         int number2 = input.nextInt();
10        if(operator == '+'){
11            System.out.println("Addition: "+(number1 + number2));
12        }
13        else if(operator == '-'){
14            System.out.println("Subtraction: "+(number1 - number2));
15        }
16        else if(operator == '*'){
17            System.out.println("Multiplication: "+(number1 * number2));
18        }
19        else{
20            System.out.println("Division: "+(number1 / number2));
21        }
22    }
23 }
24
```

Run Practice ×

"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2025.2.1\lib\idea_rt.jar=...
For Addition press + , Subtraction - , Multiplication * , Division /
Enter a number and press which you want and enter another number: 10 + 32
Addition: 42

6. This program works for print 1 to n number using for loop.

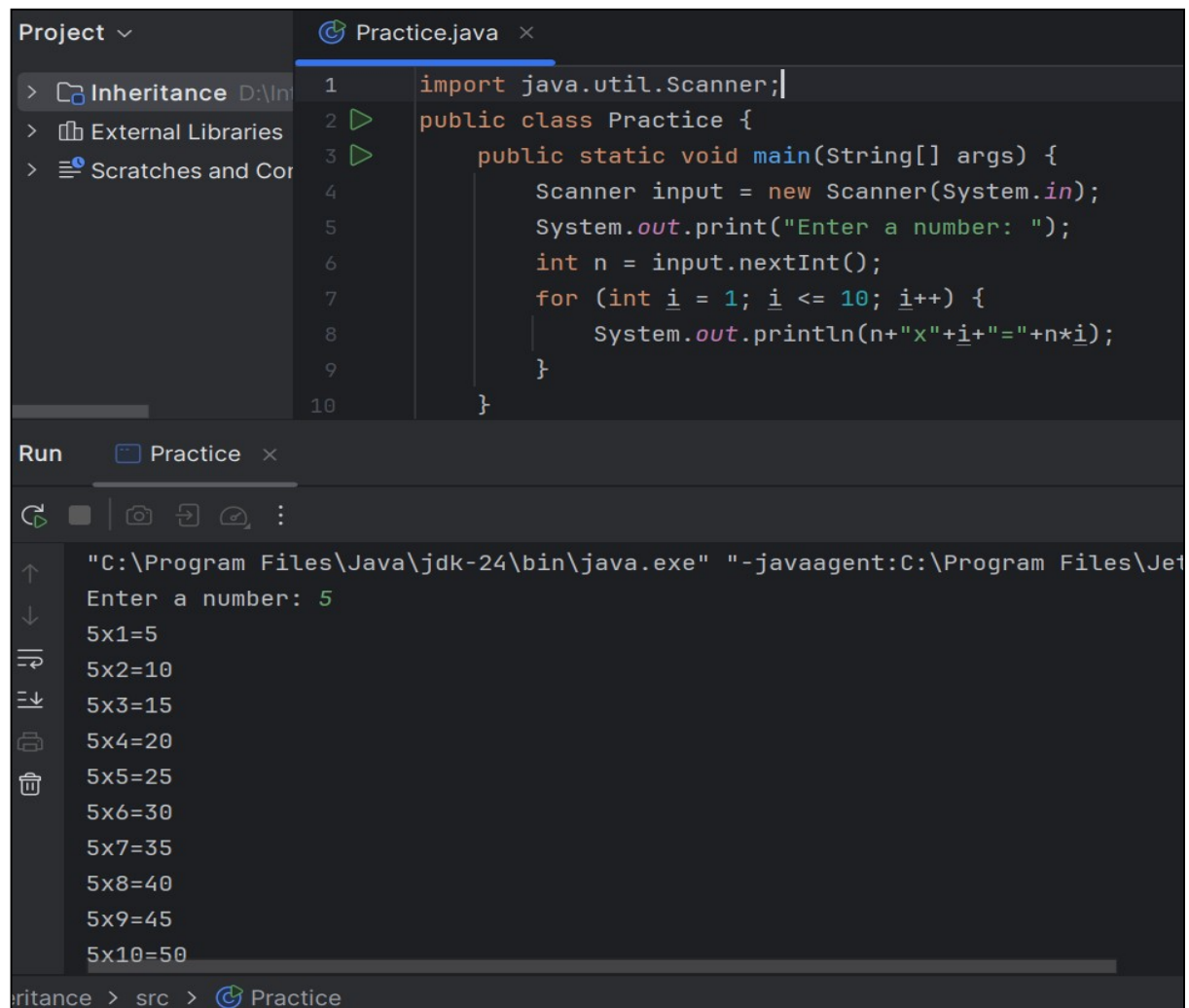


```
Project ▾ Practice.java ×
> Inheritance D:\Int
> External Libraries
> Scratches and Cor

1  import java.util.Scanner;
2  public class Practice {
3      public static void main(String[] args) {
4          Scanner input = new Scanner(System.in);
5          System.out.print("Enter a number: ");
6          int n = input.nextInt();
7          for (int i = 1; i <= n; i++) {
8              System.out.print(i);
9              System.out.print(" ");
10         }
11     }
12 }
13

Run Practice ×
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\JetBra
Enter a number: 5
1 2 3 4 5
Process finished with exit code 0
```

7. This program works for a multiplication table.



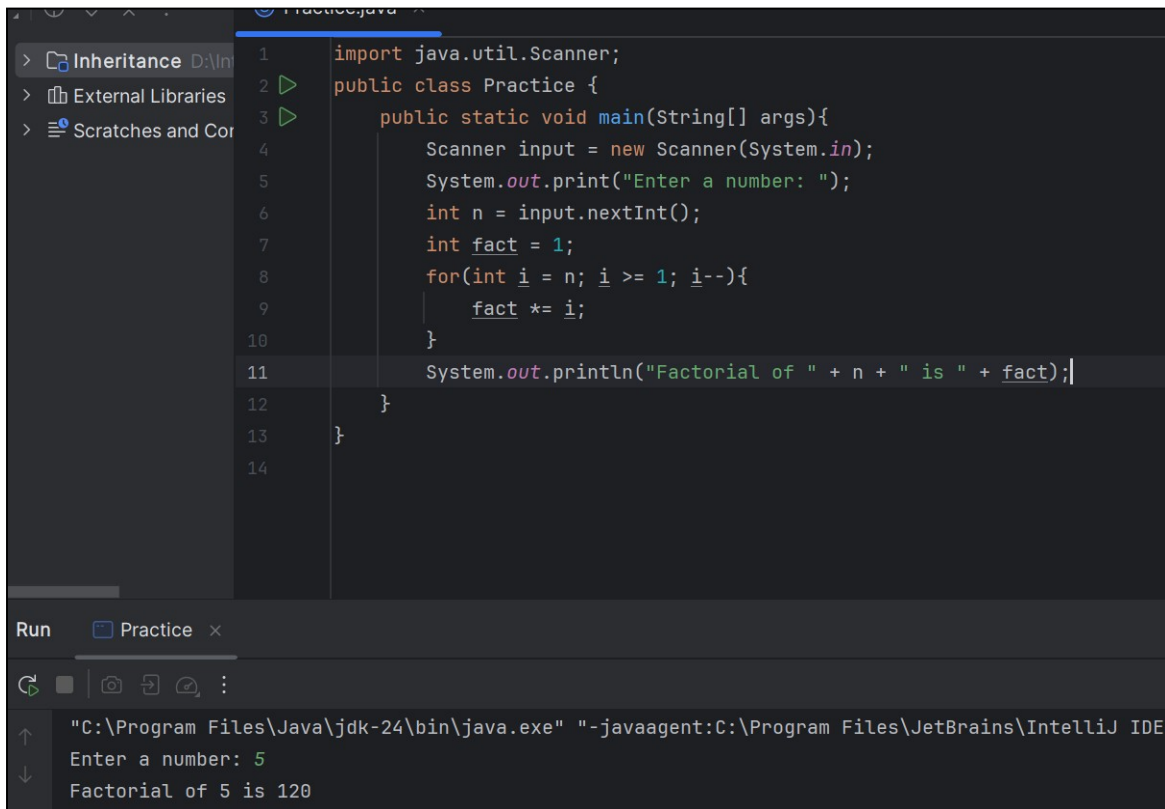
```
Project ▾ Practice.java ×
> Inheritance D:\Int
> External Libraries
> Scratches and Cor

1  import java.util.Scanner;|
2  public class Practice {
3      public static void main(String[] args) {
4          Scanner input = new Scanner(System.in);
5          System.out.print("Enter a number: ");
6          int n = input.nextInt();
7          for (int i = 1; i <= 10; i++) {
8              System.out.println(n+"x"+i+"="+n*i);
9          }
10     }
11 }

Run Practice ×
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\Jet
Enter a number: 5
5x1=5
5x2=10
5x3=15
5x4=20
5x5=25
5x6=30
5x7=35
5x8=40
5x9=45
5x10=50

heritance > src > Practice
```

8. This program works for factorial of a number



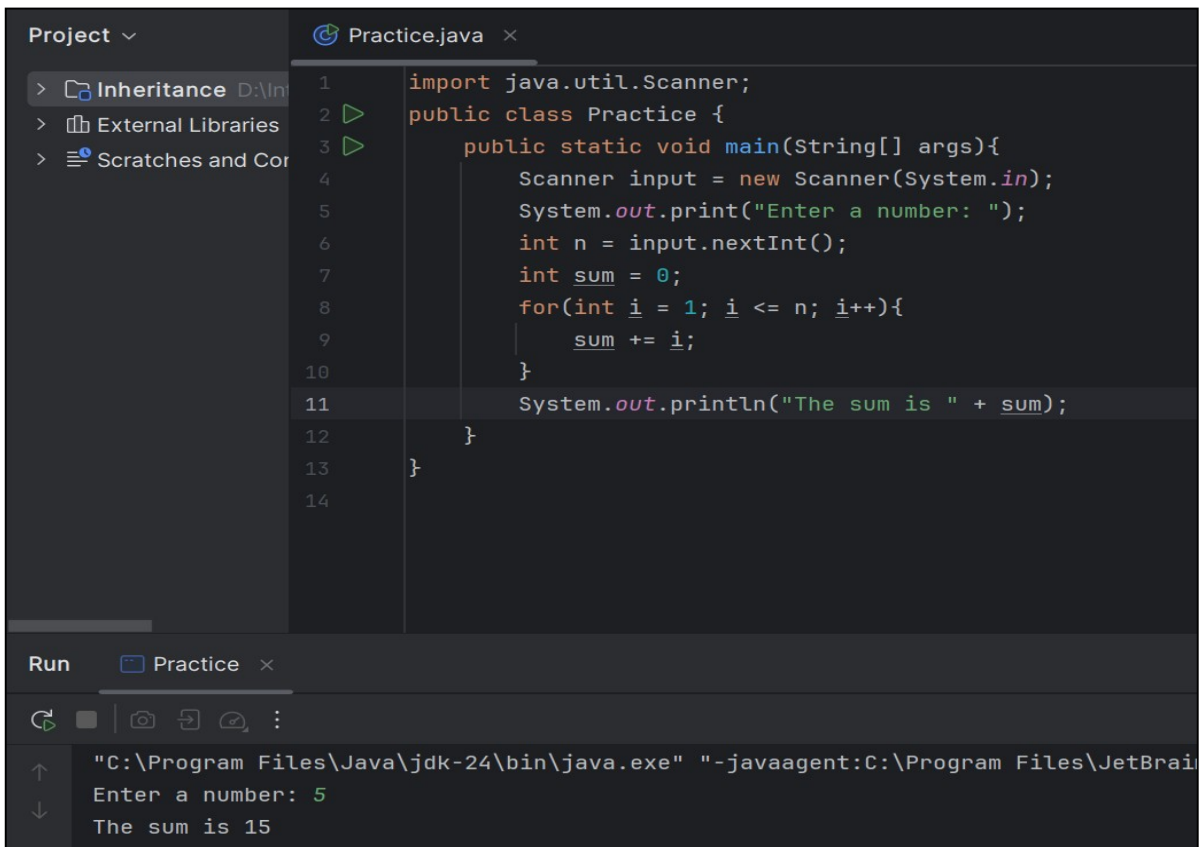
The screenshot shows the IntelliJ IDEA IDE with a project named 'Practice'. The 'Practice.java' file is open, displaying the following code:

```
1 import java.util.Scanner;
2 public class Practice {
3     public static void main(String[] args){
4         Scanner input = new Scanner(System.in);
5         System.out.print("Enter a number: ");
6         int n = input.nextInt();
7         int fact = 1;
8         for(int i = n; i >= 1; i--){
9             fact *= i;
10        }
11        System.out.println("Factorial of " + n + " is " + fact);
12    }
13 }
14
```

The 'Run' button is visible, and the output console shows the execution results:

```
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDE
Enter a number: 5
Factorial of 5 is 120
```

9. This program works for sum of all number between 1 and n.



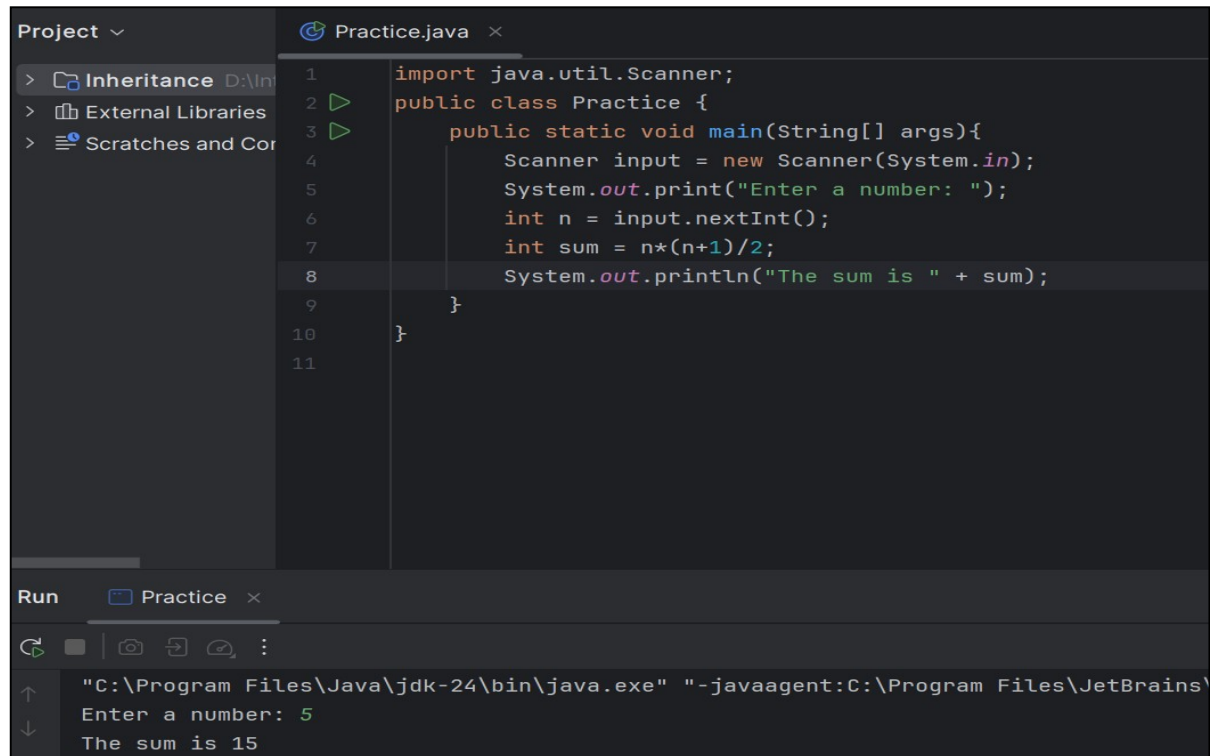
The screenshot shows the IntelliJ IDEA IDE with a project named 'Practice'. The 'Practice.java' file is open, displaying the following code:

```
1 import java.util.Scanner;
2 public class Practice {
3     public static void main(String[] args){
4         Scanner input = new Scanner(System.in);
5         System.out.print("Enter a number: ");
6         int n = input.nextInt();
7         int sum = 0;
8         for(int i = 1; i <= n; i++){
9             sum += i;
10        }
11        System.out.println("The sum is " + sum);
12    }
13 }
14
```

The 'Run' button is visible, and the output console shows the execution results:

```
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDE
Enter a number: 5
The sum is 15
```


Or, in this way it can solve more efficiently



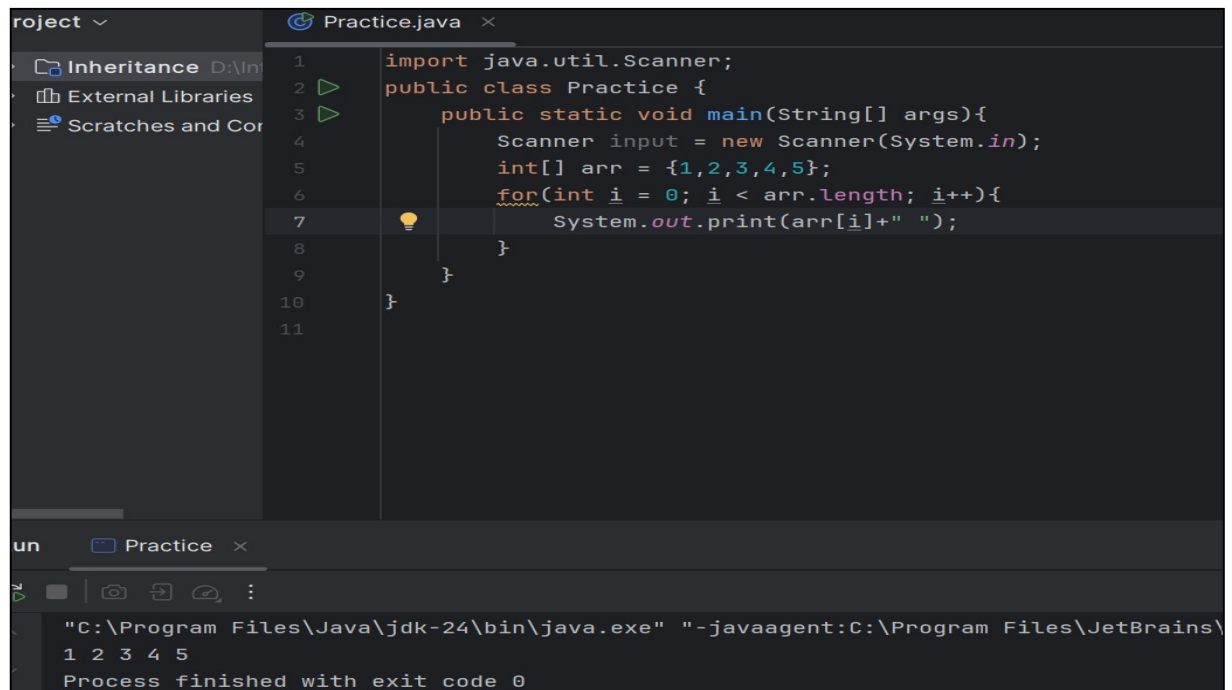
The screenshot shows an IDE with a project named 'Practice'. The main editor displays the following Java code:

```
1 import java.util.Scanner;
2 public class Practice {
3     public static void main(String[] args){
4         Scanner input = new Scanner(System.in);
5         System.out.print("Enter a number: ");
6         int n = input.nextInt();
7         int sum = n*(n+1)/2;
8         System.out.println("The sum is " + sum);
9     }
10 }
11
```

The Run console shows the execution of the program:

```
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\
Enter a number: 5
The sum is 15
```

10. This program works for print an array



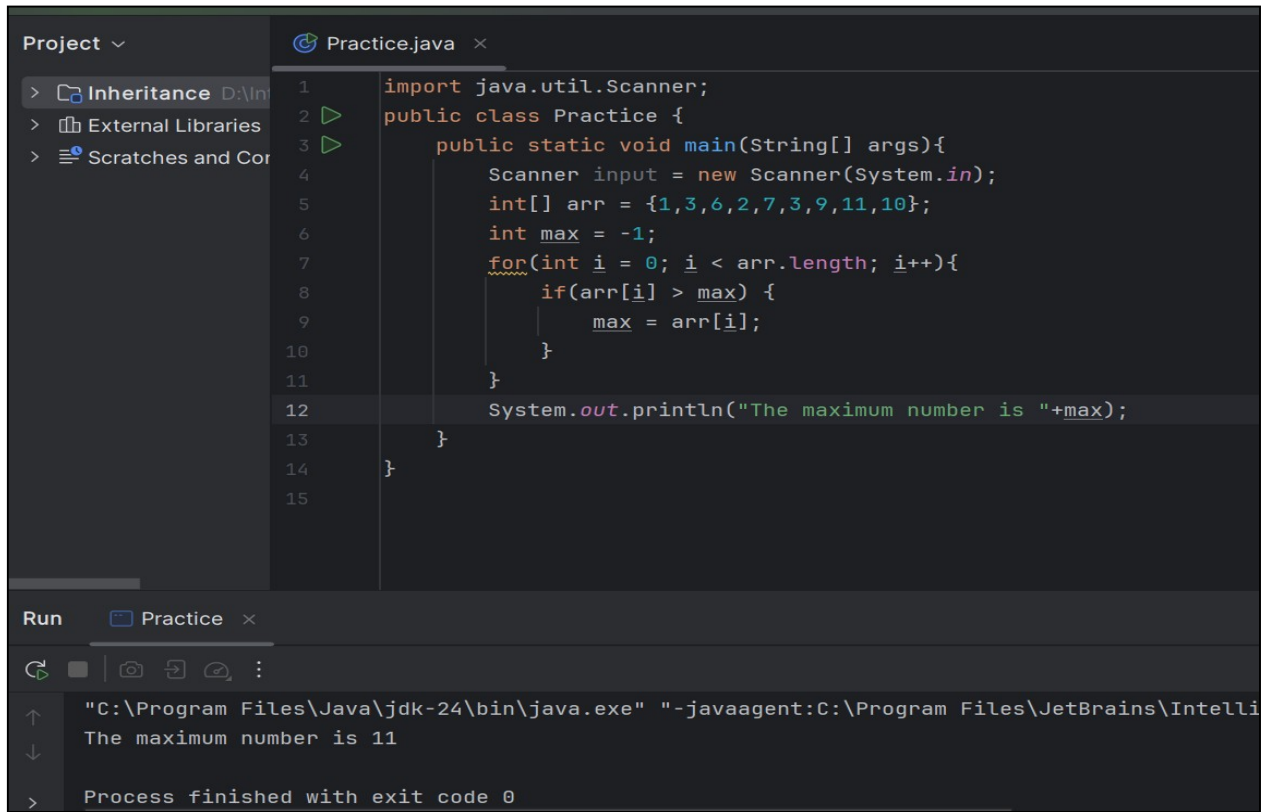
The screenshot shows an IDE with a project named 'Practice'. The main editor displays the following Java code:

```
1 import java.util.Scanner;
2 public class Practice {
3     public static void main(String[] args){
4         Scanner input = new Scanner(System.in);
5         int[] arr = {1,2,3,4,5};
6         for(int i = 0; i < arr.length; i++){
7             System.out.print(arr[i]+" ");
8         }
9     }
10 }
11
```

The Run console shows the execution of the program:

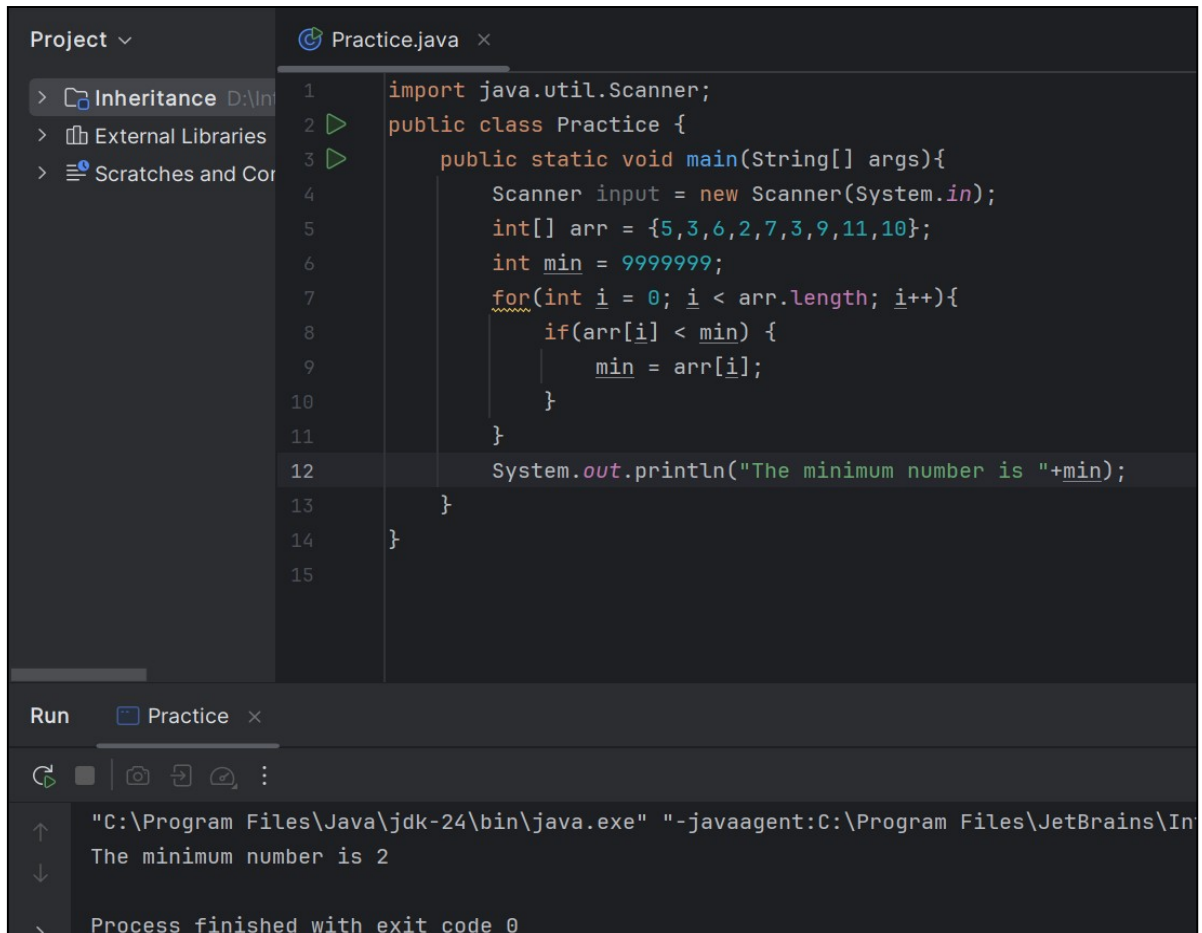
```
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\
1 2 3 4 5
Process finished with exit code 0
```

11. This program works for find maximum number from an array



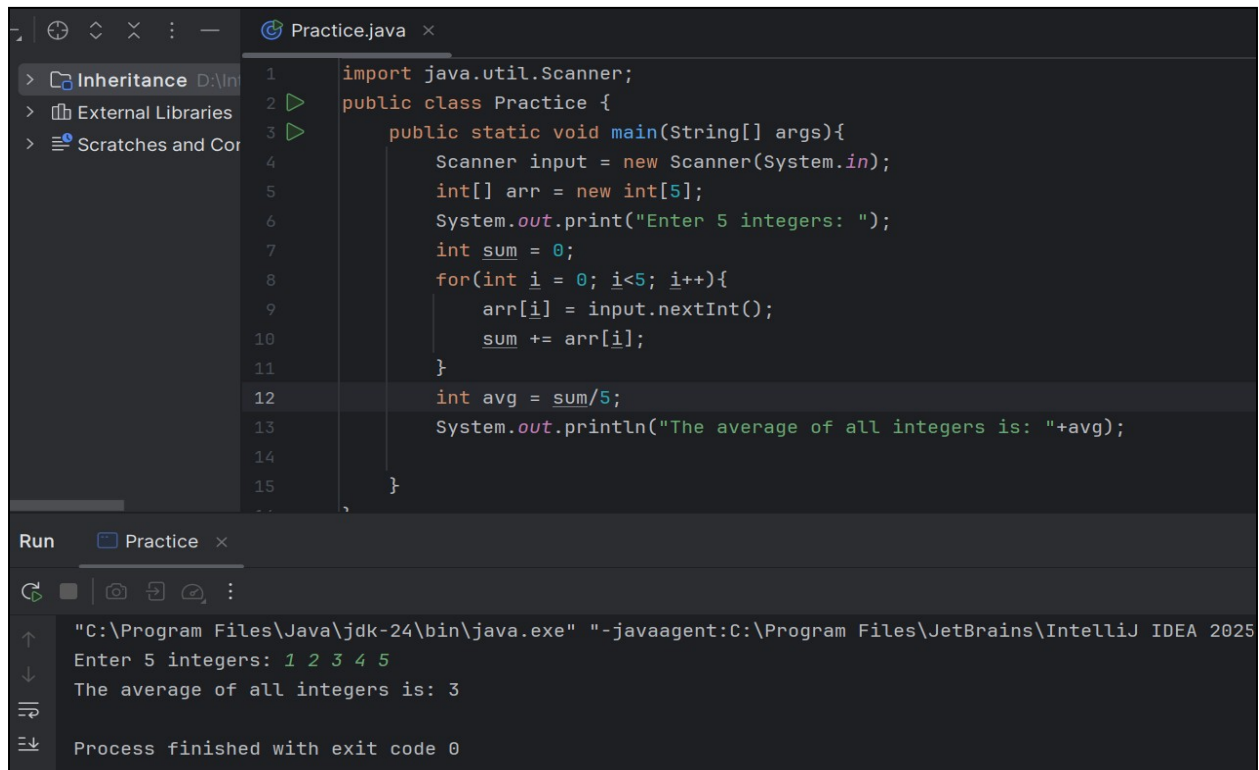
```
Project ▾ Practice.java ×  
1 import java.util.Scanner;  
2 public class Practice {  
3     public static void main(String[] args){  
4         Scanner input = new Scanner(System.in);  
5         int[] arr = {1,3,6,2,7,3,9,11,10};  
6         int max = -1;  
7         for(int i = 0; i < arr.length; i++){  
8             if(arr[i] > max) {  
9                 max = arr[i];  
10            }  
11        }  
12        System.out.println("The maximum number is "+max);  
13    }  
14 }  
15  
Run Practice ×  
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\Intelli  
The maximum number is 11  
Process finished with exit code 0
```

12. This program works for find minimum number from array



```
Project ▾ Practice.java ×  
1 import java.util.Scanner;  
2 public class Practice {  
3     public static void main(String[] args){  
4         Scanner input = new Scanner(System.in);  
5         int[] arr = {5,3,6,2,7,3,9,11,10};  
6         int min = 9999999;  
7         for(int i = 0; i < arr.length; i++){  
8             if(arr[i] < min) {  
9                 min = arr[i];  
10            }  
11        }  
12        System.out.println("The minimum number is "+min);  
13    }  
14 }  
15  
Run Practice ×  
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\In  
The minimum number is 2  
Process finished with exit code 0
```


13. This program works for find the average of the array,

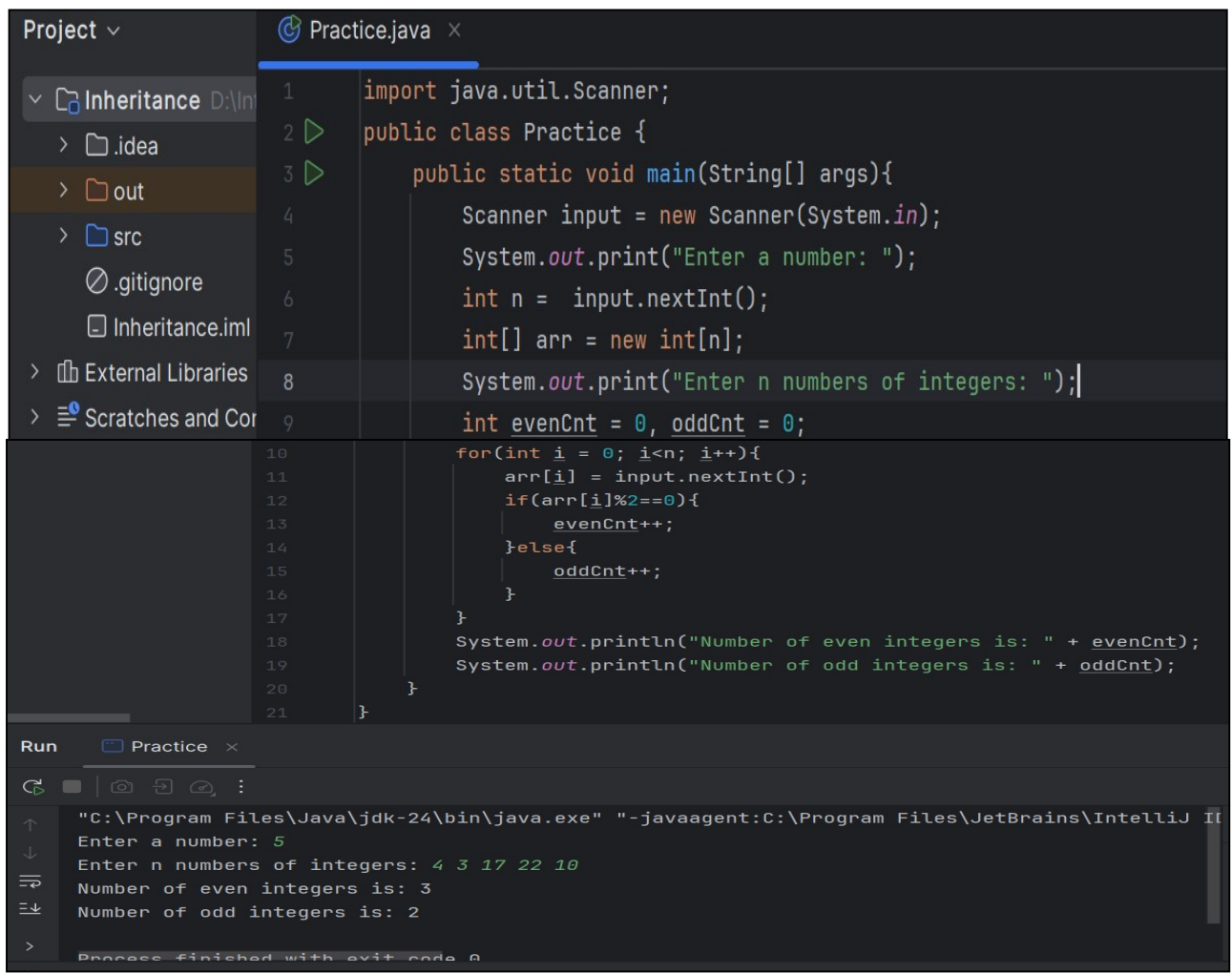


The screenshot shows the IntelliJ IDEA IDE with a project named 'Inheritance' and a file named 'Practice.java'. The code in 'Practice.java' is as follows:

```
1 import java.util.Scanner;
2 public class Practice {
3     public static void main(String[] args){
4         Scanner input = new Scanner(System.in);
5         int[] arr = new int[5];
6         System.out.print("Enter 5 integers: ");
7         int sum = 0;
8         for(int i = 0; i<5; i++){
9             arr[i] = input.nextInt();
10            sum += arr[i];
11        }
12        int avg = sum/5;
13        System.out.println("The average of all integers is: "+avg);
14    }
15 }
```

The Run window shows the execution of the program. The command used is "C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2025". The input is "Enter 5 integers: 1 2 3 4 5". The output is "The average of all integers is: 3". The process finished with exit code 0.

14. This program works for find number of even and odd from an array.

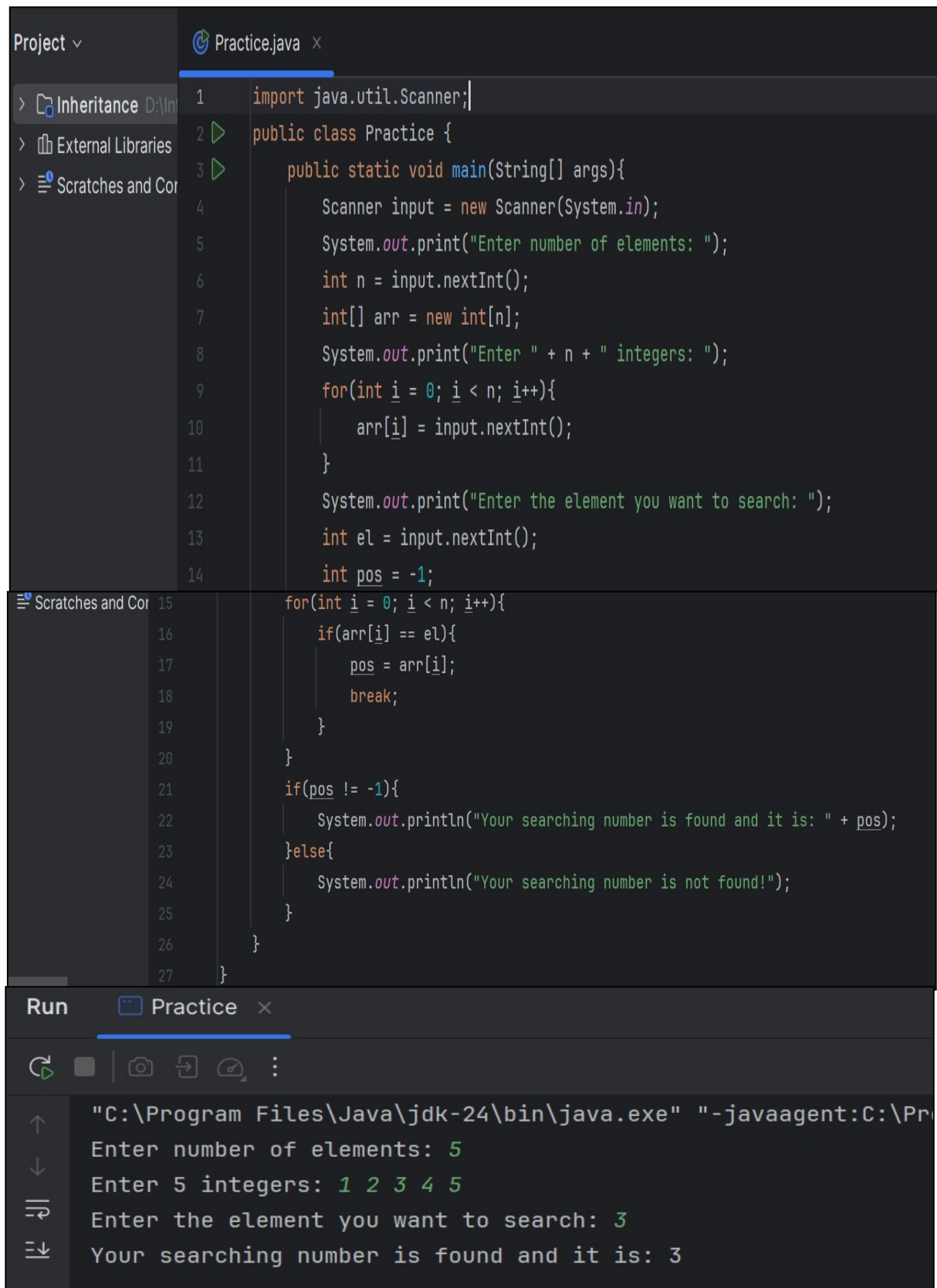


The screenshot shows the IntelliJ IDEA IDE with a project named 'Inheritance' and a file named 'Practice.java'. The code in 'Practice.java' is as follows:

```
1 import java.util.Scanner;
2 public class Practice {
3     public static void main(String[] args){
4         Scanner input = new Scanner(System.in);
5         System.out.print("Enter a number: ");
6         int n = input.nextInt();
7         int[] arr = new int[n];
8         System.out.print("Enter n numbers of integers: ");
9
10        int evenCnt = 0, oddCnt = 0;
11        for(int i = 0; i<n; i++){
12            arr[i] = input.nextInt();
13            if(arr[i]%2==0){
14                evenCnt++;
15            }else{
16                oddCnt++;
17            }
18        }
19        System.out.println("Number of even integers is: " + evenCnt);
20        System.out.println("Number of odd integers is: " + oddCnt);
21    }
22 }
```

The Run window shows the execution of the program. The command used is "C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2025". The input is "Enter a number: 5" and "Enter n numbers of integers: 4 3 17 22 10". The output is "Number of even integers is: 3" and "Number of odd integers is: 2". The process finished with exit code 0.

15. This program for Searching an integer from an array



```
Project ▾ Practice.java ×  
> Inheritance D:\Int 1 import java.util.Scanner;  
> External Libraries 2 public class Practice {  
> Scratches and Cor 3     public static void main(String[] args){  
4         Scanner input = new Scanner(System.in);  
5         System.out.print("Enter number of elements: ");  
6         int n = input.nextInt();  
7         int[] arr = new int[n];  
8         System.out.print("Enter " + n + " integers: ");  
9         for(int i = 0; i < n; i++){  
10             arr[i] = input.nextInt();  
11         }  
12         System.out.print("Enter the element you want to search: ");  
13         int el = input.nextInt();  
14         int pos = -1;  
15         for(int i = 0; i < n; i++){  
16             if(arr[i] == el){  
17                 pos = arr[i];  
18                 break;  
19             }  
20         }  
21         if(pos != -1){  
22             System.out.println("Your searching number is found and it is: " + pos);  
23         }else{  
24             System.out.println("Your searching number is not found!");  
25         }  
26     }  
27 }
```

Run Practice ×

↑ "C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Pr
↓ Enter number of elements: 5
⇌ Enter 5 integers: 1 2 3 4 5
⇌ Enter the element you want to search: 3
⇌ Your searching number is found and it is: 3

16. This program works for Sorting of array in Ascending order

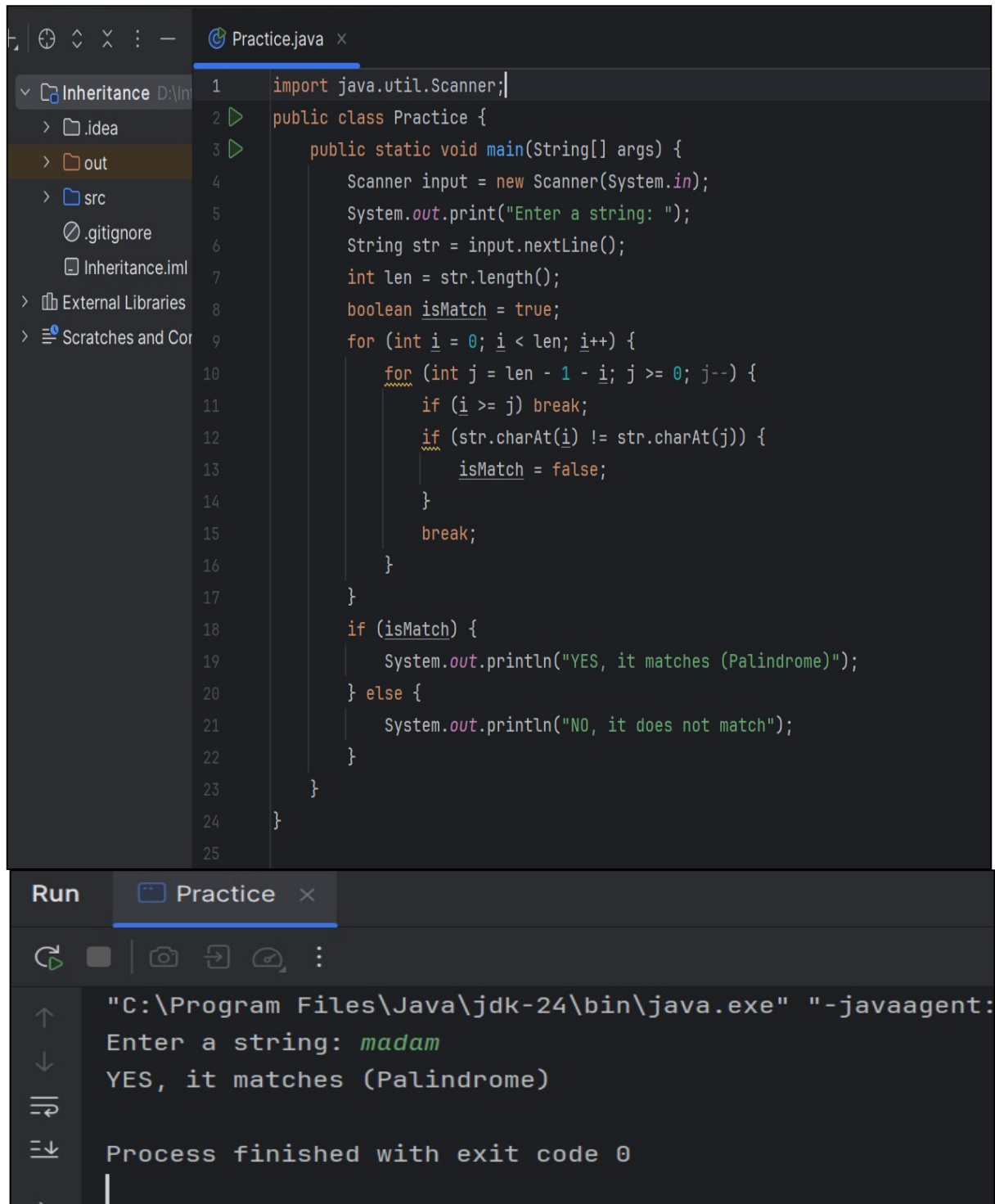
The image shows an IDE with a project named 'Inheritance' and a file named 'Practice.java'. The code implements a bubble sort algorithm to sort an array of integers in ascending order. The program prompts the user to enter the number of elements and then the elements themselves. It then displays the sorted array.

```
1 import java.util.Scanner;
2 public class Practice {
3     public static void main(String[] args){
4         Scanner input = new Scanner(System.in);
5         System.out.print("Enter number of elements: ");
6         int n = input.nextInt();
7         int[] arr = new int[n];
8         System.out.print("Enter " + n + " integers: ");
9         for(int i = 0; i < n; i++){
10             arr[i] = input.nextInt();
11         }
12         for(int i = n-1; i > 0; i--){
13             for(int j = 0; j < i; j++){
14                 if(arr[j] > arr[j+1]){
15                     int temp = arr[j];
16                     arr[j] = arr[j+1];
17                     arr[j+1] = temp;
18                 }
19             }
20         }
21         System.out.print("Array in Ascending sorted order: ");
22         for(int i = 0; i < n; i++){
23             System.out.print(arr[i] + " ");
24         }
25     }
26 }
```

The Run window shows the execution of the program. The command used is `"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\`. The output is as follows:

```
Enter number of elements: 6
Enter 6 integers: 3 7 1 9 2 4
Array in Ascending sorted order: 1 2 3 4 7 9
Process finished with exit code 0
```

17. This program works for that the given string is Pallindrome or not.



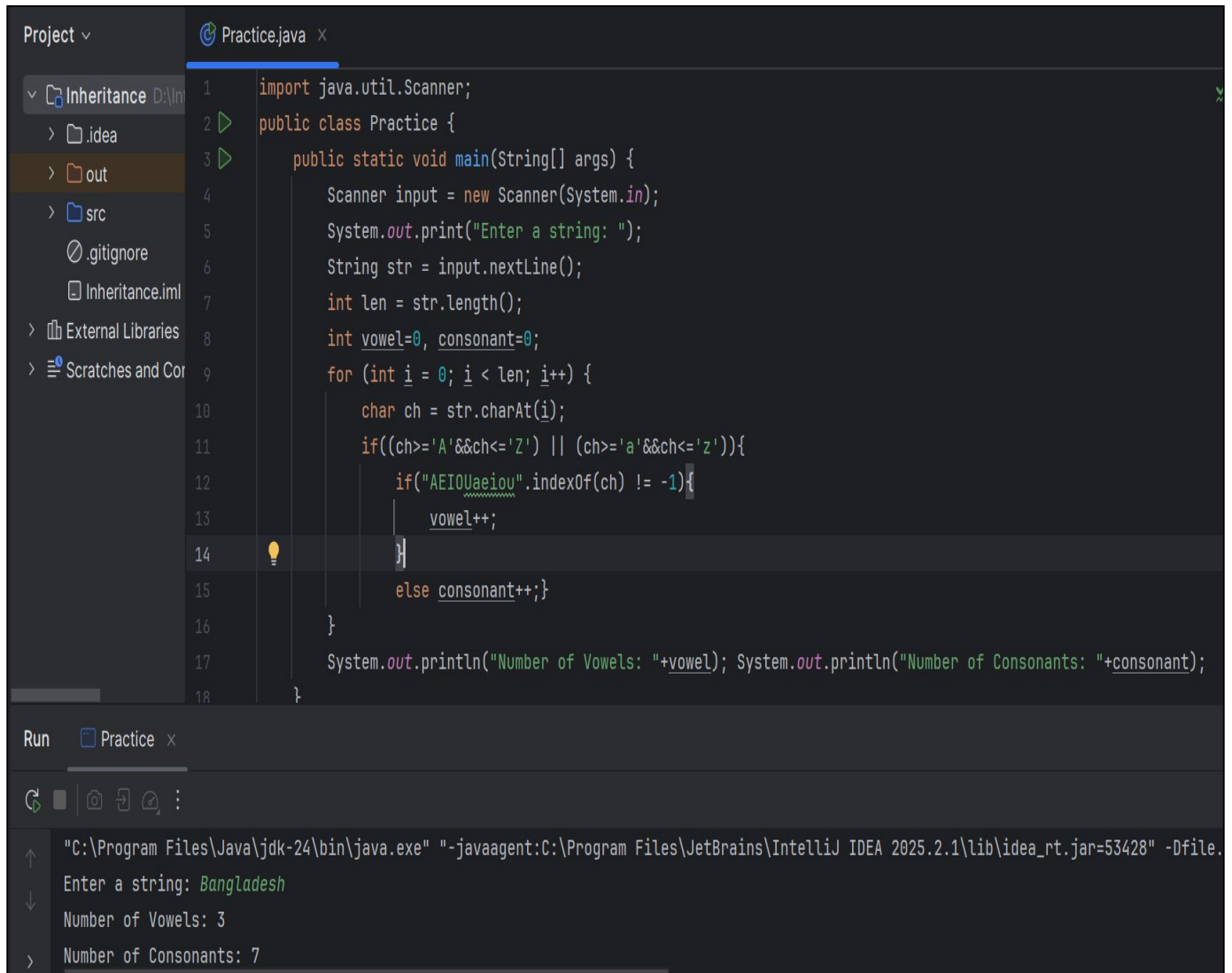
```
1 import java.util.Scanner;
2 public class Practice {
3     public static void main(String[] args) {
4         Scanner input = new Scanner(System.in);
5         System.out.print("Enter a string: ");
6         String str = input.nextLine();
7         int len = str.length();
8         boolean isMatch = true;
9         for (int i = 0; i < len; i++) {
10             for (int j = len - 1 - i; j >= 0; j--) {
11                 if (i >= j) break;
12                 if (str.charAt(i) != str.charAt(j)) {
13                     isMatch = false;
14                 }
15                 break;
16             }
17         }
18         if (isMatch) {
19             System.out.println("YES, it matches (Palindrome)");
20         } else {
21             System.out.println("NO, it does not match");
22         }
23     }
24 }
25
```

Run Practice

"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:
Enter a string: *madam*
YES, it matches (Palindrome)

Process finished with exit code 0

18. This program works for count Vowel and Consonant from a String.



The screenshot shows an IDE with a project named 'Inheritance' and a file named 'Practice.java'. The code in 'Practice.java' is as follows:

```
1 import java.util.Scanner;
2 public class Practice {
3     public static void main(String[] args) {
4         Scanner input = new Scanner(System.in);
5         System.out.print("Enter a string: ");
6         String str = input.nextLine();
7         int len = str.length();
8         int vowel=0, consonant=0;
9         for (int i = 0; i < len; i++) {
10             char ch = str.charAt(i);
11             if((ch>='A'&&ch<='Z') || (ch>='a'&&ch<='z')){
12                 if("AEIOUaeiou".indexOf(ch) != -1){
13                     vowel++;
14                 }
15                 else consonant++;
16             }
17         }
18         System.out.println("Number of Vowels: "+vowel); System.out.println("Number of Consonants: "+consonant);
19     }
20 }
```

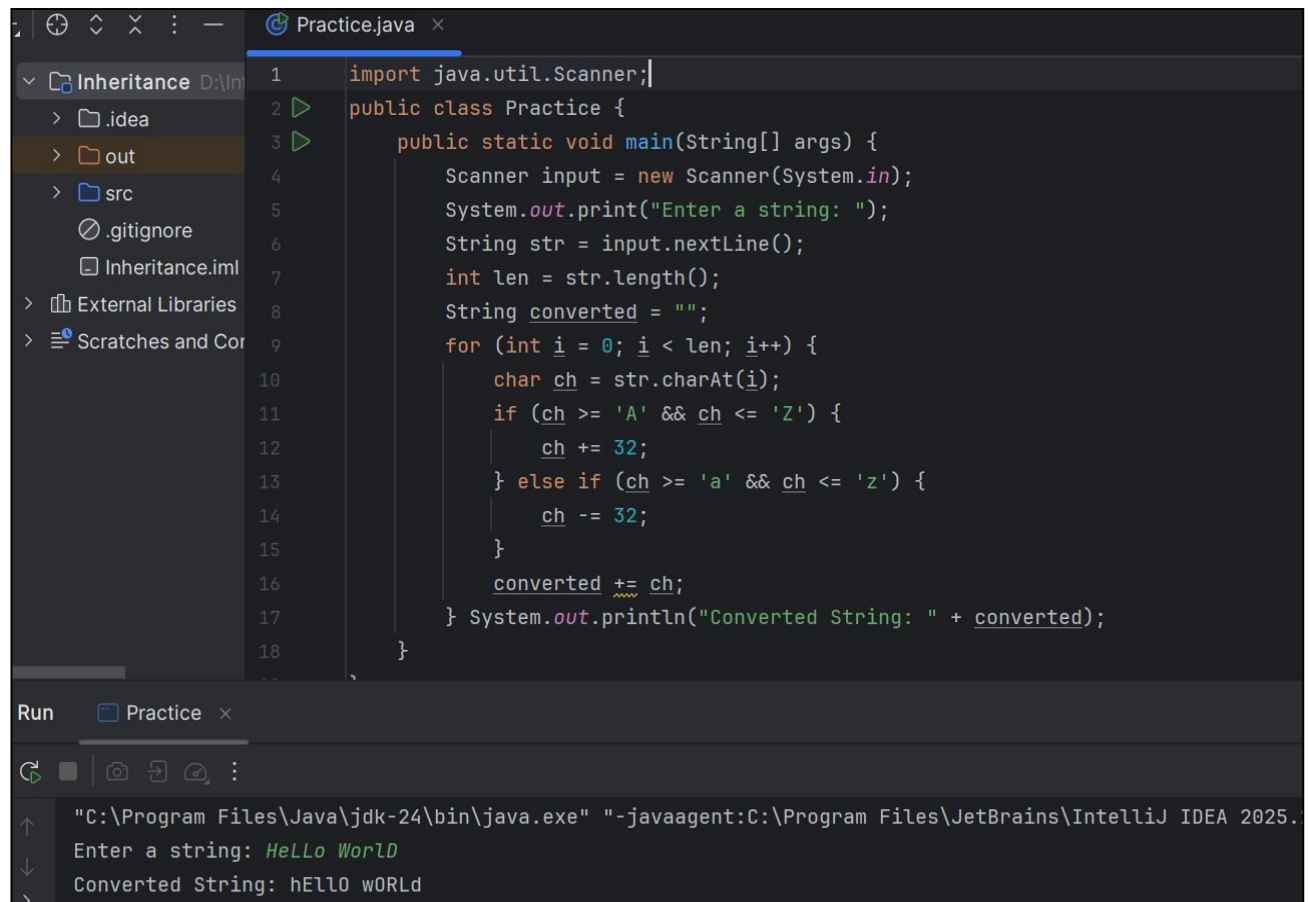
The 'Run' tab shows the execution of the program. The command used is:

```
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2025.2.1\lib\idea_rt.jar=53428" -Dfile.encoding=UTF-8
```

The output of the program is:

```
Enter a string: Bangladesh
Number of Vowels: 3
Number of Consonants: 7
```


19. This program works for Converting Upper Case and Lower case



The screenshot displays an IDE with a project named 'Inheritance' and a file named 'Practice.java'. The code in 'Practice.java' is as follows:

```
1 import java.util.Scanner;
2 public class Practice {
3     public static void main(String[] args) {
4         Scanner input = new Scanner(System.in);
5         System.out.print("Enter a string: ");
6         String str = input.nextLine();
7         int len = str.length();
8         String converted = "";
9         for (int i = 0; i < len; i++) {
10             char ch = str.charAt(i);
11             if (ch >= 'A' && ch <= 'Z') {
12                 ch += 32;
13             } else if (ch >= 'a' && ch <= 'z') {
14                 ch -= 32;
15             }
16             converted += ch;
17         } System.out.println("Converted String: " + converted);
18     }
```

Below the code editor, the 'Run' tab is active, showing the execution of the program. The command prompt displays the following output:

```
"C:\Program Files\Java\jdk-24\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2025.1\lib\idea_rt.jar"
Enter a string: HeLLo WorLD
Converted String: hELLo wORLd
```