



EAST WEST UNIVERSITY

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Section: 06

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LAB-02

SUBMITTED TO

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P1

```
package lab2;

import java.util.Scanner;

public class CheckOddOrEven {

    public static void main(String[] args){

        Scanner input= new Scanner (System.in);

        int x;

        System.out.println("Process Started");

        System.out.println("Enter the number:");

        x=input.nextInt();

        if(x%2==0)

        {

            System.out.println("The number is Even");

        }

        else if(x%2!=0)

        {

            System.out.println("The number is Odd");

        }

        System.out.println("Process Completed");

    }

}
```

```
C:\Users\bmsha\jdks\openjdk-18.0.1.1\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\lib\idea_rt.jar=51496:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\bin" -Dfile.encoding=UTF-8
Process Started
Enter the number:
29
The number is Odd
Process Completed

Process finished with exit code 0
```

P2

```
package lab2;

import java.util.Scanner;

public class Fibonacci {

    public static void main(String[] args){
```

```
Scanner input= new Scanner (System.in);
```

```
    double sum=0;
```

```
    int x,y=1,z,i,a=0;
```

```
System.out.println("Enter the limit:");
```

```
x=input.nextInt();
```

```
for(i=1;i<=x;i++)
```

```
{
```

```
    sum=sum+y;
```

```
    z=a+y;
```

```
    a=y;
```

```
    y=z;
```

```
    System.out.print(a+" ");
```

```
}
```

```
double avg= sum/x;
```

```
System.out.printf("\n"+sum);
```

```
System.out.printf("\n"+avg);
```

```
}
```

```
}
```

The screenshot shows the IntelliJ IDEA interface with the following details:

- Project Structure:** The project is named "Lab2" and contains a "src" directory with multiple Java files (P1.java, P2.java, P6.java, P7.java, P8.java, P11.java, P13.java, P14.java, P17.java) and a main file "P2.java".
- P2.java Content:** The code defines a class P2 with a main method. It uses a scanner to read an integer input. A loop iterates from 1 to the input value, summing odd numbers and printing them. The average of the sum is also calculated and printed.
- Run Tab:** The run configuration "P2" is selected, and the output window shows the execution results:

```
Enter the limit:  
25  
1 1 2 3 5 8 13 21 34 55 89 144 233 377 610  
1596.0  
106.4  
Process finished with exit code 0
```
- Bottom Status Bar:** Shows build status, terminal, and system information like temperature and time.

P3

```
package lab2;

import java.util.Scanner;

public class SquarePattern {

    public static void main(String[] args){

        Scanner input= new Scanner (System.in);

        int x,i,j;

        System.out.println("Enter the size:");

        x=input.nextInt();

        for(i=1; i<=x; i++){

            for(j=1; j<=x; j++){

                System.out.printf("#");

            }

            System.out.println("");

        }

    }

}
```

The screenshot shows the IntelliJ IDEA interface with the following details:

- Project Structure:** The project is named "Lab2". It contains a "src" directory which includes files P1.java through P17.java, and a file Lab2.java.
- Code Editor:** The code for P3.java is displayed. The code defines a class P3 with a main method that prints a square pattern of '#' characters based on user input.
- Run Tab:** The "Run" tab is selected, showing the command: "C:\Users\bmsha\.jdks\openjdk-18.0.1.1\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\lib\idea_rt.jar=51553:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\bin".
- Output Window:** The output window shows the execution of the program. It prompts "Enter the size:" and then prints five lines of five '#' characters each, followed by a blank line. The output ends with "Process finished with exit code 0".
- Bottom Status Bar:** The status bar at the bottom shows "Build completed successfully in 1 sec, 577 ms (moments ago)" and system information like "11:1 CRLF UTF-8 4 spaces", "31°C Haze", and "ENG 10:05 PM".

P4

A)

```
package lab2;

import java.util.Scanner;

public class PatternA {

    public static void main(String[] args){
        Scanner input= new Scanner (System.in);

        int x,i,j,k = 0;

        System.out.println("Enter the size:");
        x=input.nextInt();

        for(i=1; i<=x; i++){
            for(j=x; j>=i; j--){
                System.out.print(" ");
            }

            for(k=1; k<=2*i-1; k++)
            {
                System.out.printf("#");
            }

            System.out.println("");
        }
    }
}
```

The screenshot shows the IntelliJ IDEA interface with the following details:

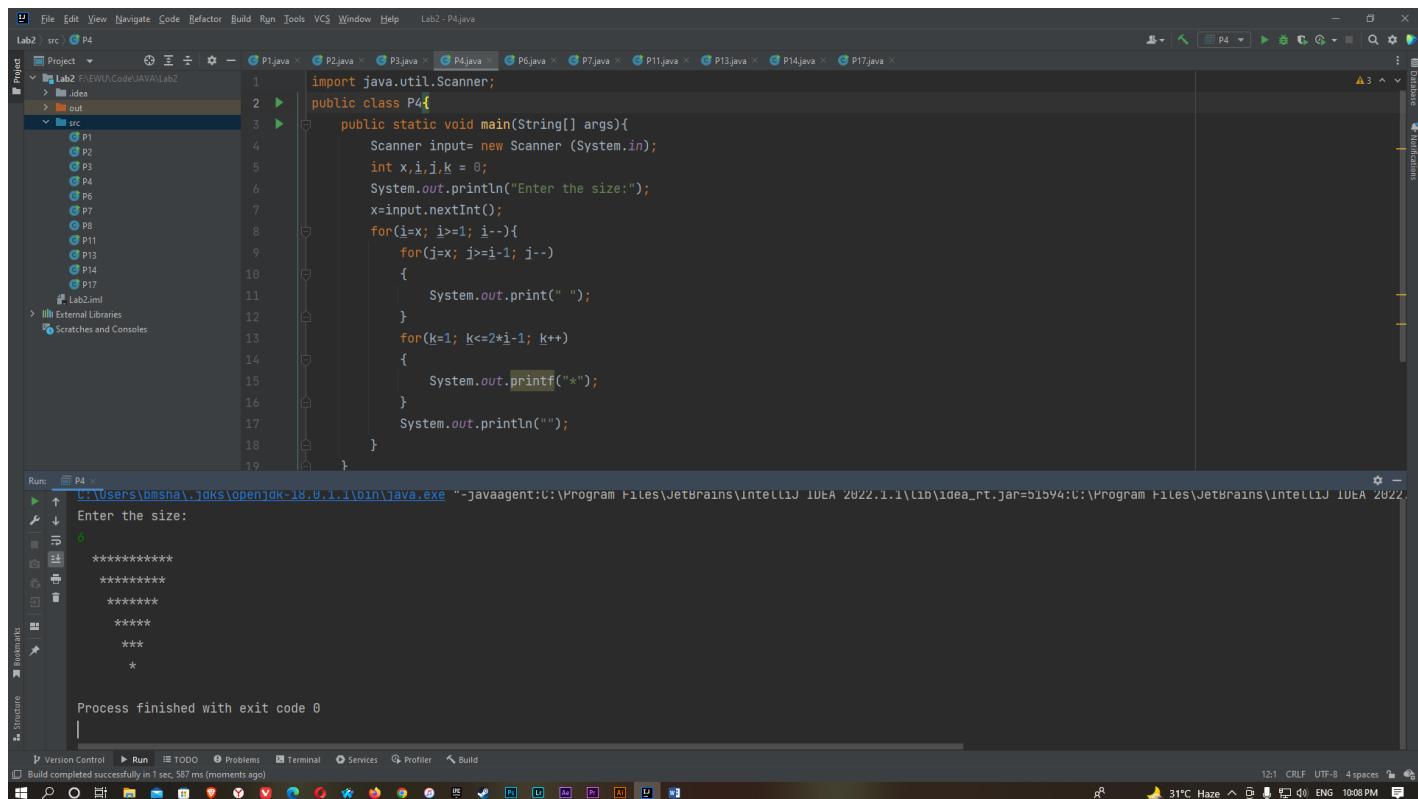
- Project:** Lab2
- Code Editor:** P4.java (selected)
- Code Content:**

```
public static void main(String[] args){  
    Scanner input= new Scanner (System.in);  
    int x,i,j,k = 0;  
    System.out.println("Enter the size:");  
    x=input.nextInt();  
    for(i=1; i<=x; i++){  
        for(j=x; j>=i; j--) {  
            System.out.print(" ");  
        }  
        for(k=1; k<=2*i-1; k++)  
        {  
            System.out.printf("#");  
        }  
        System.out.println("");  
    }  
}
```
- Run Tab:** Shows the command used to run the program: `C:\Users\bmssha\Downloads\openjdk-18.0.1.1\bin\java.exe -javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\lib\idea_rt.jar=b1576:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\bin`. The output shows the program prompting for size and then printing a pattern of spaces and hashtags.
- Status Bar:** Shows build status, terminal tab, and system information (12:1 CRLF, UTF-8, 4 spaces).

B)

```
package lab2;  
  
import java.util.Scanner;  
  
public class PatternA {  
  
    public static void main(String[] args){  
  
        Scanner input= new Scanner (System.in);  
  
        int x,i,j,k = 0;  
  
        System.out.println("Enter the size:");  
  
        x=input.nextInt();  
  
        for(i=x; i>=1; i--){  
  
            for(j=x; j>=i-1; j--) {  
                System.out.print(" ");  
            }  
  
            for(k=1; k<=2*i-1; k++)  
            {  
                System.out.printf("*");  
            }  
            System.out.println("");  
        }  
    }  
}
```

```
        }  
  
        System.out.println("");  
  
    }  
  
}
```



P5

A)

```
package lab2;

import java.util.Scanner;

public class Pattern5 {

    public static void main(String[] args){

        Scanner input= new Scanner (System.in);

        int x,i,j;

        System.out.println("Enter the size:");

        x=input.nextInt();

        for(i=1; i<=x; i++){

            for(j=1; j<=i; j++){

                System.out.print("*");
            }

            System.out.println();
        }
    }
}
```

```

        System.out.print(j);

    }

    System.out.println("");


}

}

```

The screenshot shows the IntelliJ IDEA interface with the following details:

- Project Structure:** The project is named "Lab2" and contains a "src" directory with files P1 through P7.
- Code Editor:** The file "P5.java" is open, displaying the following Java code:


```

import java.util.Scanner;
public class P5 {
    public static void main(String[] args){
        Scanner input= new Scanner (System.in);
        int x,i,j;
        System.out.println("Enter the size:");
        x=input.nextInt();
        for(i=1; i<=x; i++){
            for(j=1; j<=i; j++){
                System.out.print(j);
            }
            System.out.println("");
        }
    }
}
      
```
- Run Tab:** The "Run" tab is selected, showing the command used to run the program: "C:\Users\bmsha\.jdks\openjdk-18.0.1.1\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\lib\idea_rt.jar=51613:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\bin".
- Output Window:** The output window shows the execution of the program, prompting "Enter the size:" and then printing the following pattern:


```

Enter the size:
1
12
123
1234
12345
123456
1234567
12345678
      
```

B)

```

package lab2;

import java.util.Scanner;

public class Pattern5 {

    public static void main(String[] args){

        Scanner input= new Scanner (System.in);

        int x,i,j,k;

        System.out.println("Enter the size:");

        x=input.nextInt();

        for(i=x; i>0; i--){

            for(k=x; k>=i; k--){

                System.out.print(" ");
            }
        }
    }
}
      
```

```

}

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

System.out.println(" ");
}

}

```

The screenshot shows an IDE interface with a dark theme. The top menu bar includes File, Edit, View, Navigate, Code, Refactor, Build, Run, Tools, VCS, Window, Help, and Lab2 - P5.java. The Project sidebar shows a project named Lab2 with a subfolder src containing files P1 through P17. The main editor window displays the code for P5.java:

```

import java.util.Scanner;
public class P5 {
    public static void main(String[] args){
        Scanner input= new Scanner (System.in);
        int x,i,j,k;
        System.out.println("Enter the size:");
        x=input.nextInt();
        for(i=x; i>0; i--){
            for(k=x; k>i; k--){
                System.out.print(" ");
            }
            for(j=1; j<=i; j++){
                System.out.print(j);
            }
            System.out.println(" ");
        }
    }
}

```

The Run tab at the bottom shows the output of the program:

```

12345678
1234567
123456
12345
1234
123
12
1

```

Below the output, it says "Process finished with exit code 0". The status bar at the bottom right shows the time as 14:11, temperature as 31°C, and battery level as Haze.

C)

```

package lab2;

import java.util.Scanner;

public class Pattern5 {

    public static void main(String[] args){
        Scanner input= new Scanner (System.in);
        int x,i,j,k;
        System.out.println("Enter the size:");
        x=input.nextInt();
        for(i=1; i<=x; i++){

```

```

for(k=x; k>=i; k--){
    System.out.print(" ");
}

for(j=i; j>=1; j--){
    System.out.print(j);
}

System.out.println(" ");

}

}

```

The screenshot shows the IntelliJ IDEA interface with the following details:

- Project View:** Shows a project named "Lab2" with a "src" directory containing multiple Java files (P1.java through P17.java) and a "Lab2.iml" file.
- Code Editor:** Displays the content of P5.java. The code is a Java program that prints a pattern of numbers based on user input. It uses nested loops to print a triangle of digits from 1 to 9.
- Run Tab:** Shows the command used to run the application: "C:\Users\bmsha\.jdks\openjdk-18.0.1.1\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\lib\idea_rt.jar=51644:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\bin".
- Output Tab:** Shows the standard output of the application. It prompts the user to enter a size and then prints a series of digits forming a triangular pattern.
- Terminal Tab:** Shows the build log: "Build completed successfully in 1 sec 414 ms (moments ago)".
- Bottom Status Bar:** Displays system information including temperature (31°C), battery status, and time (10:11 PM).

```

public class P5 {
    public static void main(String[] args){
        Scanner input= new Scanner (System.in);
        int x,i,j,k;
        System.out.println("Enter the size:");
        x=input.nextInt();
        for(i=1; i<=x; i++){
            for(k=x; k>=i; k--){
                System.out.print(" ");
            }
            for(j=1; j>=1; j--){
                System.out.print(j);
            }
            System.out.println(" ");
        }
    }
}

```

```

Enter the size:
1
21
321
4321
54321
654321
7654321
87654321

```

D)

```

package lab2;

import java.util.Scanner;

public class Pattern5 {

    public static void main(String[] args){
        Scanner input= new Scanner (System.in);

        int x,i,j,k;

        System.out.println("Enter the size:");

```

```

x=input.nextInt();

for(i=x; i>0; i--){
    for(j=i; j>=1; j--){
        System.out.print(j);
    }
    System.out.println(" ");
}
}

```

The screenshot shows the IntelliJ IDEA interface with the following details:

- Project View:** Shows a project named "Lab2" with a "src" directory containing files P1 through P17, and a "Lab2.iml" file.
- Code Editor:** Displays the content of the file "P5.java". The code is as follows:

```

import java.util.Scanner;
public class P5 {
    public static void main(String[] args){
        Scanner input= new Scanner (System.in);
        int x,i,j;
        System.out.println("Enter the size:");
        x=input.nextInt();
        for(i=x; i>0; i--){
            for(j=i; j>=1; j--){
                System.out.print(j);
            }
            System.out.println(" ");
        }
    }
}

```

- Run Tab:** Shows the command used to run the program: "C:\Users\bmsla\.jdks\openjdk-18.0.1.1\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\lib\idea_rt.jar=51657:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\bin". The output window shows the following sequence of numbers:

```

Enter the size:
87654321
7654321
654321
54321
4321
321
21
1

```

E)

```

package lab2;

import java.util.Scanner;

public class Pattern5 {

    public static void main(String[] args){
        Scanner input= new Scanner (System.in);

        int x,i,j;

        System.out.println("Enter the size:");

        x=input.nextInt();
    }
}

```

```

for(i=1; i<=x; i++){
    for(j=1; j<=i; j++){
        System.out.print("* ");
    }
    System.out.println("");
}
}

```

The screenshot shows the IntelliJ IDEA interface with the project structure and code editor. The code for P5.java is displayed:

```

public class P5 {
    public static void main(String[] args){
        Scanner input= new Scanner (System.in);
        int x,i,j;
        System.out.println("Enter the size:");
        x=input.nextInt();
        for(i=1; i<=x; i++){
            for(j=1; j<=i; j++){
                System.out.print("* ");
            }
            System.out.println("");
        }
    }
}

```

In the Run tab, the command `C:\Users\bmsha\.jdks\openjdk-18.0.1.1\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\lib\idea_rt.jar=51671:C:\Program Files\JetBrains\In` is shown, followed by the prompt `Enter the size:`. The output window displays the following pattern:

```

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

```

The status bar at the bottom right shows the time as 10:12 PM.

P6)

```

import java.util.Scanner;

import java.util.Random;

public class P6 {

    public static void main(String[] args) {
        Scanner input=new Scanner(System.in);

        Random ran= new Random ();

        int x,y;

        y=ran.nextInt(1000);

        System.out.println("Enter the number between 0 to 1000: ");
    }
}

```

```
x=1;  
while(x>=0)  
{  
    x=input.nextInt();  
    if (x > y)  
    {  
        System.out.println("Too high, try again.");  
    }  
    if (x < y)  
    {  
        System.out.println("Too low, try again.");  
    }  
    if(x==y)  
    {  
        System.out.println("Correct Guess!");  
        break;  
    }  
}  
}
```

A screenshot of a Java development environment. The code editor shows a file named P6.java with the following content:

```
import java.util.Scanner;
import java.util.Random;
public class P6 {
    public static void main(String[] args) {
        Scanner input=new Scanner(System.in);
        Random ran= new Random ();
        int x,y;
        y=ran.nextInt( bound: 1000);
        System.out.println("Enter the number between 0 to 1000: ");
        x=1;
        while(x>=0)
        {
            x=input.nextInt();
            if (x > y)
            {
                System.out.println("Too high, try again.");
            }
        }
    }
}
```

The terminal window below shows the execution of the program:

```
↑ Enter the number between 0 to 1000:
↓ 500
Too high, try again.
↓ 50
Too low, try again.
↓ 75
Too low, try again.
↓ 888
Too high, try again.
↓ 999
Too high, try again.
```

The status bar at the bottom right indicates: 65 (764 chars, 28 line breaks) CRLF UTF-8 4 spaces. The system status shows: 28°C Cloudy ENG 10:22 PM.

P7)

```
import java.util.Scanner;

public class P7 {

    public static void main(String[] args) {

        Scanner input = new Scanner(System.in);

        int i,j,k;

        for (i=1; i<=7; i++)

        {

            for (j=1; j<=i; j++)

            {

                System.out.print(j);

            }

            for (k=7-i; k>=1; k--)

            {

                System.out.print("*");

            }

        }

    }

}
```

```

        System.out.println("");
    }
}

}

```

The screenshot shows the IntelliJ IDEA interface with the following details:

- Project:** Lab2 FAEWU\CodeJAVA\Lab2
- Code Editor:** P8.java (selected tab) contains the following Java code:

```

public class P8 {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int i,j,k;
        for (i=1; i<=7; i++)
        {
            for (j=1; j<=i; j++)
            {
                System.out.print(j);
            }
            for (k=7-i; k>=1; k--)
            {
                System.out.print("*");
            }
            System.out.println("");
        }
    }
}

```
- Run Tab:** Shows the command run: `C:\Users\bmsa.jdk\openjdk-18.0.1.1\bin\java.exe -javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\lib\idea_rt.jar=51183:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\bin`. The output window displays the following text:

```

1*****
12****
123***_
1234**_
12345*_
123456*
1234567

Process finished with exit code 0

```
- Bottom Status Bar:** Shows the system tray, battery level (31°C Haze), and the current time (11:11 PM).

P8)

```

import java.util.Scanner;

public class P8 {

    public static void main(String[] args) {

        Scanner input=new Scanner(System.in);

        int i;

        System.out.println("Enter the Word:");

        String x=input.nextLine();

        String y="";

        for(i=x.length()-1; i>=0; i--)

        {

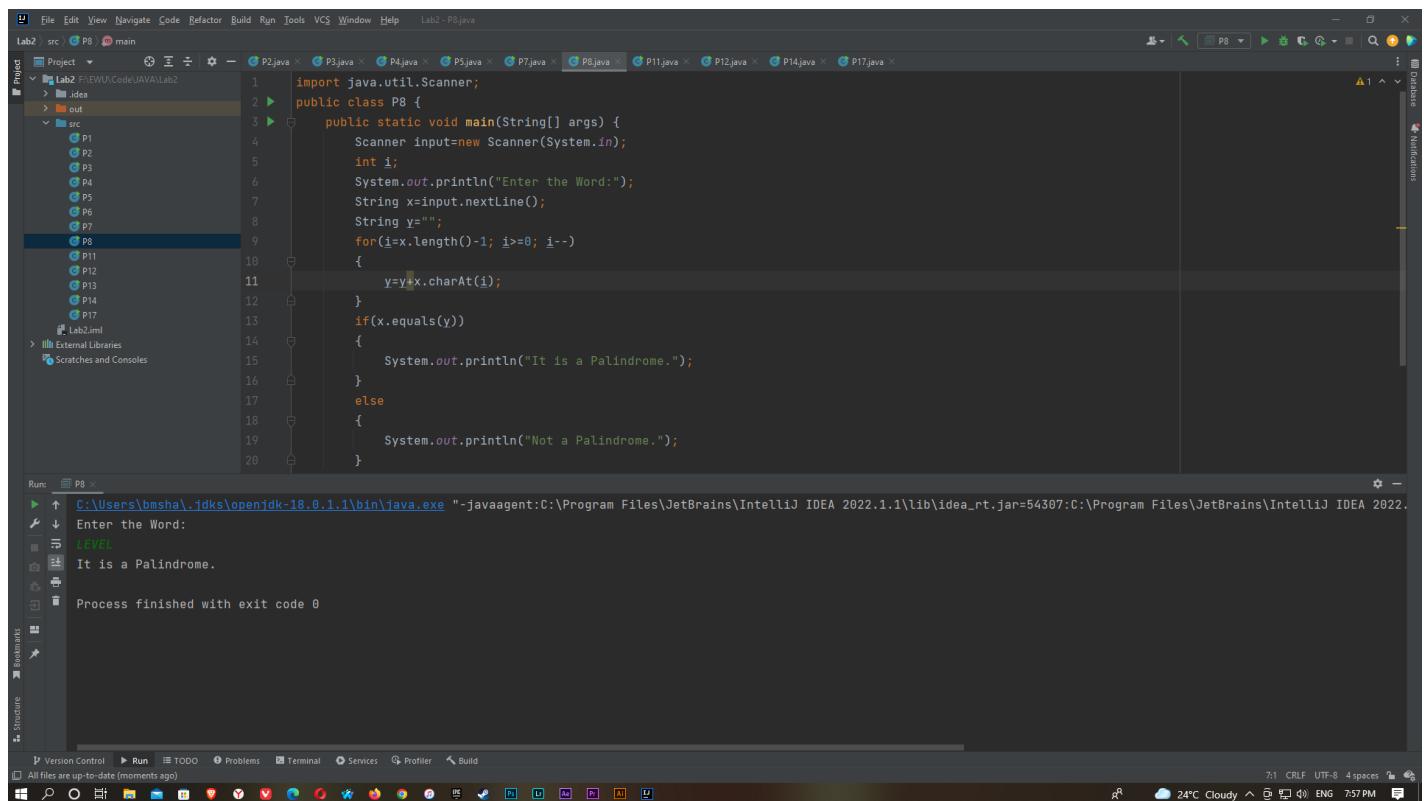
            y=y+x.charAt(i);

        }

        if(x.equals(y))
    }
}

```

```
    {  
        System.out.println("It is a Palindrome.");  
    }  
    else  
    {  
        System.out.println("Not a Palindrome.");  
    }  
}
```



P9)

```
import java.util.Scanner;

public class ListOfOddAndEven09 {

    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);

        System.out.print("Enter the number of elements you want to store: ");

        int n = input.nextInt();

        System.out.print("Enter any integer : ");

        int[] a = new int[n];
```

```

for(int i=0; i<n; i++) {
    a[i]=input.nextInt();
}

for(int i=0;i<n;i++){
    if(a[i]%2!=0){
        System.out.print(a[i]);
    }
}

for(int i=0;i<n;i++){
    if(a[i]%2==0){
        System.out.print(a[i]);
    }
}

}

```

P10)

i)(while loop)

```

import java.util.Scanner;

public class Pattern10Using_While {

    public static void main(String[] args) {

        Scanner input = new Scanner(System.in);

        System.out.print("Enter the size : ");

        int n = input.nextInt();

        int i=1;

        while(i!=n+1){

            int j=1,k=1;

            while(j<=n-i){

                System.out.print(" ");

                j++;
            }

        }
    }
}
```

```

        while(k<i*2){

            System.out.print(i);

            k++;

        }

        System.out.print("\n");

        i++;

    }

}

```

ii) (Using for loop)

```

import java.util.Scanner;

public class P10 {

    public static void main(String[] args)

    {

        Scanner input=new Scanner(System.in);

        int x,i,j,k;

        System.out.println("Input the number:");

        x=input.nextInt();

        for(i=1; i<=x; i++)

        {

            for(k=x; k>=i; k--)

            {

                System.out.print(" ");

            }

            for(j=i; j>=1; j--)

            {

                System.out.print(j);

            }

            for(j=2;j<=i;j++)

            {

                System.out.print(j);

            }

        }

    }

}

```

```

    }

    System.out.println(" ");

}

}

```

The screenshot shows the IntelliJ IDEA interface with the following details:

- Project Structure:** The project is named "Lab2" and contains a "src" directory with files P1 through P18, and a "P10" file selected.
- Code Editor:** The code for P10.java is displayed:

```

1 import java.util.Scanner;
2 public class P10 {
3     public static void main(String[] args) {
4         Scanner input=new Scanner(System.in);
5         int x,i,j,k;
6         System.out.println("Input the number:");
7         x=input.nextInt();
8         for(i=1; i<=x; i++) {
9             for(k=x; k>=i; k--)
10            {
11                System.out.print(" ");
12            }
13            for(j=i; j>=1; j--)
14            {
15                System.out.print(j);
16            }
17        }
18    }

```
- Run Tab:** The "Run" tab is active, showing the command: "C:\Users\bmsha\.jdks\openjdk-18.0.1.1\bin\java.exe" -javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\lib\idea_rt.jar=58767:C:\Program Files\JetBrains\In". The output window shows the following:

```

Input the number:
1
212
32123
4321234
543212345

Process finished with exit code 0

```
- Bottom Status Bar:** Shows "Build completed successfully in 1 sec, 472 ms (a minute ago)" and system information like "610 CRLF UTF-8 4 spaces ENG 11:47 PM".

P11)

```

import java.util.Scanner;

public class P11 {

    public static void main(String[] args) {

        Scanner xy= new Scanner(System.in);

        int n,i;

        float a=0;

        System.out.println("Enter the number: ");

        n =xy.nextInt();

        System.out.printf("The sum of the series 1+ ");

        for(i=1;i<=n;i++)

        {
            a=a+(float)1/i;

```

```

        System.out.printf("1/" + i + " + ");
    }

    System.out.printf("= " + a);
}

}

```

The screenshot shows the IntelliJ IDEA interface with the following details:

- Project Structure:** The project is named "Lab2" and contains a "src" directory with files P1.java through P17.java.
- Code Editor:** The file "P11.java" is open, displaying the following code:


```

1 import java.util.Scanner;
2 public class P11 {
3     public static void main(String[] args) {
4         Scanner xy = new Scanner(System.in);
5         int n, i;
6         float a = 0;
7         System.out.println("Enter the number: ");
8         n = xy.nextInt();
9         System.out.print("The sum of the series 1+ ");
10        for (i = 1; i <= n; i++) {
11            a += (float) 1 / i;
12            System.out.print("1/" + i + " + ");
13        }
14        System.out.print("= " + a);
15    }
16 }
      
```
- Run Tab:** The "Run" tab is selected, showing the command used to run the program: `C:\Users\bmsha\.jdks\openjdk-18.0.1.1\bin\java.exe -javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\lib\idea_rt.jar=51688:C:\Program Files\JetBrains\In`. The output window shows the following:


```

↑ C:\Users\bmsha\.jdks\openjdk-18.0.1.1\bin\java.exe -javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\lib\idea_rt.jar=51688:C:\Program Files\JetBrains\In
↓ Enter the number:
10
The sum of the series 1+ 1/1+ 1/2+ 1/3+ 1/4+ 1/5+ 1/6+ 1/7+ 1/8+ 1/9+ 1/10+ = 2.9289684
Process finished with exit code 0
      
```
- Bottom Bar:** Shows various system icons and the current date and time: 31°C Haze, ENG, 10:14 PM.

P12)

```

import java.util.Scanner;

public class P12 {

    public static void main(String[] args) {

        Scanner input = new Scanner(System.in);

        int x, y;

        System.out.println("Enter the first number:");

        x = input.nextInt();

        System.out.println("Enter the second number:");

        y = input.nextInt();

        System.out.print("GCD of " + x + " and " + y + " is ");

        while (x != y)
    {

```

```

if(x>y)
{
    x=x-y;
}
else
{
    y=y-x;
}

System.out.print(+x);
}
}

```

The screenshot shows the IntelliJ IDEA interface with the following details:

- Project Structure:** The project is named "Lab2". The "src" directory contains multiple Java files (P1, P2, P3, P4, P5, P6, P7, P8, P11, P12, P13, P14, P17) and one file "Lab2.iml".
- Code Editor:** The code for P12.java is displayed. It reads two integers from the user, calculates their GCD using a while loop and if-else condition, and prints the result.
- Terminal:** The terminal window shows the execution of the program. It prompts for two numbers (15 and 6), prints the GCD (3), and exits with code 0.
- Status Bar:** The status bar at the bottom shows system information like temperature (30°C), battery level (Cloudy), and time (12:36 AM).

P13)

```

import java.util.Scanner;

public class P13 {

    public static void main(String[] args) {

        Scanner input = new Scanner(System.in);

        int x,i,j,k,a=1;
    }
}

```

```
System.out.println("Enter the number:");
x=input.nextInt();
for (i=0; i<x;i++)
{
    for (j=1; j<=x-i ;j++)
    {
        System.out.print(" ");
    }
    for (k=0; k<=i; k++)
    {
        if (k==0 || i==0)
        {
            a=1;
        }
        else
        {
            a=a*(i-k+1)/k;
        }
        System.out.printf("%4d",+a);
    }
    System.out.print("\n");
}
}
```

The screenshot shows the IntelliJ IDEA interface with the following details:

- File Menu:** File, Edit, View, Navigate, Code, Refactor, Build, Run, Tools, VCS, Window, Help.
- Project Tree:** Lab2 (selected), src, .idea, out, src (containing P1, P2, P3, P4, P5, P6, P7, P8, P10, P11, P12, P13).
- Code Editor:** Lab2 - P13.java (highlighted). The code prints a right-angled triangle of numbers.
- Run Tab:** P13 selected. Output shows:

```
C:\users\bmsha.jdk\openjdk-18.0.1.1\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\lib\idea_rt.jar=62602:C:\Program Files\JetBrains\In
↑ Enter the number:
↓
      1
     1 1
    1 2 1
   1 3 3 1
  1 4 6 4 1
 1 5 10 10 5 1

Process finished with exit code 0
```
- Bottom Status Bar:** Version Control, Run, TODO, Problems, Terminal, Services, Profiler, Build, Duplicates. Build completed successfully in 1 sec, 448 ms (a minute ago).
- System Tray:** 7:23, CRLF, UTF-8, 4 spaces, ENG, 12:02 AM.

P14)

```
import java.util.Scanner;

public class P14 {

    public static void main(String[] args) {

        Scanner input = new Scanner(System.in);

        int x, i, j=1;

        System.out.println("Enter the number: ");

        x=input.nextInt();

        for(i=1; i<=x; i++)

        {

            j=j*i;

        }

        System.out.println(j);

    }
}
```

The screenshot shows the IntelliJ IDEA interface with the following details:

- Project:** Lab2 (File/EWU/Code/JAVA/Lab2)
- Code Editor:** P14.java (selected), containing the following code:

```
public class P14 {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int x, i, j=1;
        System.out.println("Enter the number: ");
        x=input.nextInt();
        for(i=1; i<=x; i++)
        {
            j=j*i;
        }
        System.out.println(j);
    }
}
```
- Run Output:** Shows the execution of the program. The user enters "6" and the program outputs "720".

```
C:\Users\bmsha\jdks\openjdk-18.0.1.1\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\lib\idea_rt.jar=51704:C:\Program Files\JetBrains\In
Enter the number:
6
720
Process finished with exit code 0
```
- Bottom Status Bar:** Shows system information like CPU, RAM, and battery level.

P15)

i) (Using do while loop)

```
import java.util.Scanner;

public class P15 {

    DoWhile {

        public static void main(String[] args) {

            Scanner input = new Scanner(System.in);

            System.out.print("Input number : ");

            int num = input.nextInt();

            int reversed=0;

            do{

                int digit = num % 10;

                reversed = reversed * 10 + digit;

                num /= 10;

            }

            while(num!=0);

            System.out.println("The reversed number is : "+reversed);

        }

    }

}
```

```
}
```

```
}
```

The screenshot shows the IntelliJ IDEA interface with a Java project named 'Lab2'. The 'src' directory contains files P1 through P18. The file 'P15.java' is open and highlighted in the code editor. The code uses a while loop to reverse a number entered by the user. The run output shows the program's execution and the reversed number 4321.

```
import java.util.Scanner;
public class P15 {
    public static void main(String[] args) {
        Scanner input= new Scanner(System.in);
        int x,y=0,z;
        System.out.println("Enter the number:");
        x=input.nextInt();
        while(x!=0)
        {
            z=x%10;
            y=(y*10)+z;
            x=x/10;
        }
        System.out.println("The reversed number is : "+y);
    }
}
```

Run: P15
C:\Users\bmsha\.jdks\openjdk-18.0.1.1\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\lib\idea_rt.jar=56202:C:\Program Files\JetBrains\In
Enter the number:
1234
The reversed number is : 4321
Process finished with exit code 0

ii) (Using for loop)

```
import java.util.Scanner;

public class P15 {

    public static void main(String[] args) {

        Scanner input= new Scanner(System.in);

        int x,y=0,z;

        System.out.println("Enter the number:");

        x=input.nextInt();

        for(;x!=0;)

        {

            z=x%10;

            y=(y*10)+z;

            x=x/10;

        }

        System.out.println("The reversed number is : "+y);

    }
}
```

}

The screenshot shows the IntelliJ IDEA interface with the following details:

- Project:** Lab2 (File/EWU/CodeJAVA/Lab2)
- Source File:** P15.java
- Code Content:**

```
import java.util.Scanner;
public class P15 {
    public static void main(String[] args) {
        Scanner input= new Scanner(System.in);
        int x,y=0,z;
        System.out.println("Enter the number:");
        x=input.nextInt();
        for(;x!=0;)
        {
            z=x%10;
            y=(y*10)+z;
            x=x/10;
        }
        System.out.println("The reversed number is : "+y);
    }
}
```
- Run Output:**

```
↑ C:\Users\bmsha\.jdks\openjdk-18.0.1.1\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\lib\idea_rt.jar=57018:C:\Program Files\JetBrains\In
➤ Enter the number:
123456
The reversed number is : 654321
Process finished with exit code 0
```
- Bottom Status Bar:** Build completed successfully in 1 sec, 807 ms (3 minutes ago)
- System Tray:** 6:34, CRLF, UTF-8, 4 spaces, ENG, 10:16 PM

P16)

```
import java.util.Scanner;

public class P16 {

    public static void main(String[] args) {

        Scanner input=new Scanner(System.in);

        int x,i,j,k;

        System.out.println("Input the number:");

        x=input.nextInt();

        for(i=1; i<=x; i++)

        {

            for(k=x; k>=i; k--)

            {

                System.out.print(" ");

            }

            for(j=i; j>=1; j--)

            {

                System.out.print(j);

            }

        }

    }

}
```

```
}

for(j=2;j<=i;j++)
{
    System.out.print(j);
}

System.out.println(" ");

}

for(i=x-1; i>0; i--)
{
    for(k=x; k>=i; k--)
    {
        System.out.print(" ");
    }

    for(j=i; j>=1; j--)
    {
        System.out.print(j);
    }

    for(j=2; j<=i; j++)
    {
        System.out.print(j);
    }

    System.out.println(" ");
}

}
```

The screenshot shows an IDE interface with the following details:

- File Menu:** File, Edit, View, Navigate, Code, Refactor, Build, Run, Tools, VCS, Window, Help.
- Project Tree:** Lab2, src, .idea, out, src, P1, P2, P3, P4, P5, P6, P7, P8, P11, P12, misc.
- Code Editor:** The active file is P16.java, containing the following code:

```
import java.util.Scanner;
public class P16 {
    public static void main(String[] args) {
        Scanner input=new Scanner(System.in);
        int x,i,j,k;
        System.out.println("Input the number:");
        x=input.nextInt();
        for(i=1; i<=x; i++)
    }
}
```

- Run Output:** The output window shows the following sequence of numbers:

```
Input the number:
7
1
212
32123 |
4321234
543212345
65432123456
7654321234567
65432123456
543212345
4321234
32123
212
1
```

Process finished with exit code 0
- Bottom Status Bar:** Version Control, Run, TODO, Problems, Terminal, Services, Profiler, Build.
- System Tray:** Build completed successfully in 1 sec, 398 ms (moments ago).
- System Icons:** Taskbar icons for various applications like File Explorer, Edge, and File Manager.
- System Information:** 6/12, CRLF, UTF-8, 4 spaces, 24°C Cloudy, ENG, 11:36 PM.

P17)

```
import java.util.Scanner;

public class P17 {

    public static void main(String[] args) {

        Scanner input = new Scanner(System.in);

        int x;

        System.out.println("Enter the number: ");

        x = input.nextInt();

        if(x==1)

        {

            System.out.println("Monday");

        }

        else if(x==2)

        {

            System.out.println("Tuesday");

        }

        else if(x==3)

        {
```

```
System.out.println("Wednesday");
}
else if(x==4)
{
    System.out.println("Thursday");
}
else if(x==5)
{
    System.out.println("Friday");
}
else if(x==6)
{
    System.out.println("Saturday");
}
else
{
    System.out.println("Sunday");
}
}
```

The screenshot shows the IntelliJ IDEA interface with the following details:

- Project:** Lab2 (File/EWU/Code/JAVA/Lab2)
- Code Editor:** P17.java (selected)
- Code Content:**

```
10     System.out.println("Monday");
11 }
12 else if(x==2)
13 {
14     System.out.println("Tuesday");
15 }
16 else if(x==3)
17 {
18     System.out.println("Wednesday");
19 }
20 else if(x==4)
21 {
22     System.out.println("Thursday");
23 }
24 else if(x==5)
25 {
26     System.out.println("Friday");
```
- Run Output:**

```
C:\Users\bmsha\jdks\openjdk-18.0.1.1\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\lib\idea_rt.jar=51756:C:\Program Files\JetBrains\In
↑ Enter the number:
3
Wednesday
Process finished with exit code 0
```
- Bottom Status Bar:** All files are up-to-date (moments ago), 7:1 CRLF UTF-8 4 spaces, 31°C Haze, 10:18 PM

P18)

```
import java.util.Scanner;

public class P18 {

    public static void main(String[] args) {

        Scanner input=new Scanner(System.in);

        int x;

        System.out.println("Enter the year:");

        x=input.nextInt();

        if(x%4==0)

        {

            System.out.println(+x+" is a leap year.");

        }

        else if(x%100==0 || x%400==0)

        {

            System.out.println(+x+" is a leap year.");

        }

        else

        {

            System.out.println(+x+" is not a leap year.");
```

```
}
```

```
}
```

```
}
```

The screenshot shows the IntelliJ IDEA interface with the following details:

- Project Structure:** The project is named "Lab2" and contains a "src" directory with files P1 through P18. The file "P18.java" is currently selected.
- Code Editor:** The code for P18.java is displayed:

```
1 import java.util.Scanner;
2 public class P18 {
3     public static void main(String[] args) {
4         Scanner input=new Scanner(System.in);
5         int x;
6         System.out.println("Enter the year:");
7         x=input.nextInt();
8         if(x%4==0)
9         {
10             System.out.println(+x+" is a leap year.");
11         }
12         else if(x%100==0 || x%400==0)
13         {
14             System.out.println(+x+" is a leap year.");
15         }
16         else
17         {
```
- Run Tab:** The run configuration is set to "P18" and the command is "C:\Users\bmsha\.jdks\openjdk-18.0.1.1\bin\java.exe" -javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\lib\idea_rt.jar=55197:C:\Program Files\JetBrains\In". The output window shows:

```
↑ Enter the year:
↓ 2016
2016 is a leap year.

Process finished with exit code 0
```
- Bottom Bar:** Shows various icons for version control, run, problems, terminal, services, profiler, and build. It also displays system information like "25°C Cloudy" and the current time "8:16 PM".

P19)

```
import java.util.Scanner;

public class P19 {

    public static void main(String[] args)

    {

        Scanner in=new Scanner(System.in);

        int n,i,j,a,c=-1,x;

        float b,sum=0;

        System.out.println("Enter the value of X: ");

        x=in.nextInt();

        System.out.println("Enter the value of n: ");

        n=in.nextInt();

        for(i=1;i<=n;i=i+2)

        {

            a=1;
```

```

b=1;

for(j=1;j<=i;j++)

{

    b=b*x;

    a=a*j;

}

c=-1*c;

sum=sum+(c*b)/(float)a;

}

System.out.println("Sin"+x+"= "+sum);

}

```

The screenshot shows the IntelliJ IDEA interface with the project 'Lab2' open. The code editor displays P19.java, which contains a series of nested loops and assignments. The run output window shows the program's execution, prompting for values of x and n, and then printing the result Sin45= 2.01259085E9.

```

17
18
19
20
21
22
23
24
25
26

```

```

C:\Users\bmsha\.jdks\openjdk-18.0.1.1\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\lib\idea_rt.jar=51011:C:\Program File
Enter the value of X:
45
Enter the value of n:
10
Sin45= 2.01259085E9

Process finished with exit code 0

```

P20)

```

import java.util.Scanner;

public class P20 {

    public static void main(String[] args)

    {

        Scanner in=new Scanner(System.in);

```

```
int n,i,j,a,c=-1,x;  
float b,sum=0;  
  
System.out.println("Enter the value of X: ");  
x=in.nextInt();  
  
System.out.println("Enter the value of n: ");  
n=in.nextInt();  
  
for(i=2;i<=n;i=i+2)  
{  
    a=1;  
    b=1;  
    for(j=1;j<=i;j++)  
    {  
        b=b*x;  
        a=a*j;  
    }  
    sum=sum+(c*b)/(float)a;  
    c=-1*c;  
}  
  
System.out.println("Cos"+x+"= "+(1+sum));  
}  
}
```

The screenshot shows the IntelliJ IDEA interface with a Java project named "Lab2". The current file is "P20.java". The code implements a series expansion for cosine:

```
public class P20 {
    public static void main(String[] args) {
        double x = Double.parseDouble(args[0]);
        int n = Integer.parseInt(args[1]);
        double a = 1;
        double b = 1;
        double sum = 0;
        for (int j = 1; j <= n; j++) {
            b *= -x * x;
            a *= j;
            sum += (c * b) / (float) a;
        }
        System.out.println("Cos" + x + "=" + (1 + sum));
    }
}
```

The run configuration shows the command: `C:\users\bmsha\.jdeps\openjdk-18.0.1.1\bin\java.exe` "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2022.1.1\lib\idea_rt.jar=52782:C:\Program Files\JetBrains\In". The output window shows the program's output:

```
Enter the value of X:
1
Enter the value of n:
10
Cos1= 0.5403023
Process finished with exit code 0
```

Build completed successfully in 1 sec, 438 ms (a minute ago)

7:1 CRLF UTF-8 4 spaces ↻

29°C Cloudy ⚡ ENG 4:25 PM