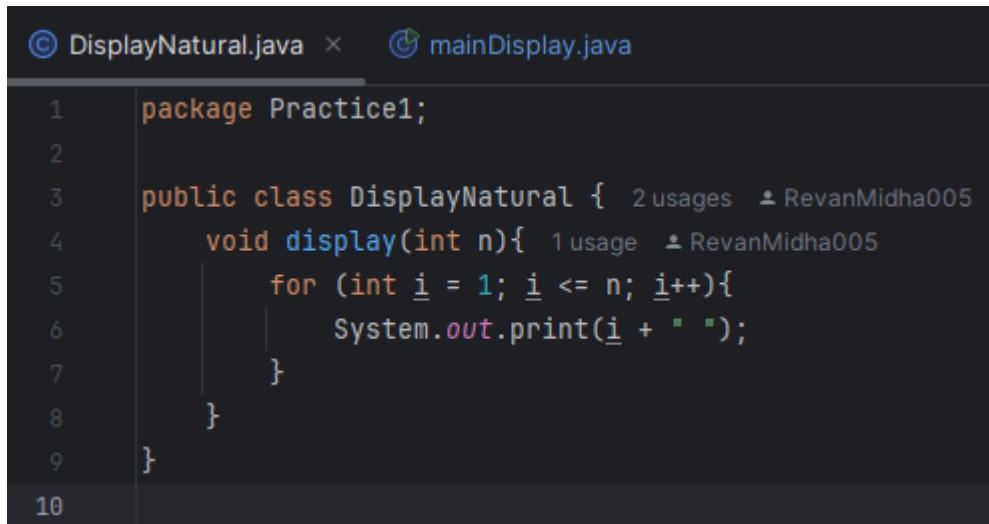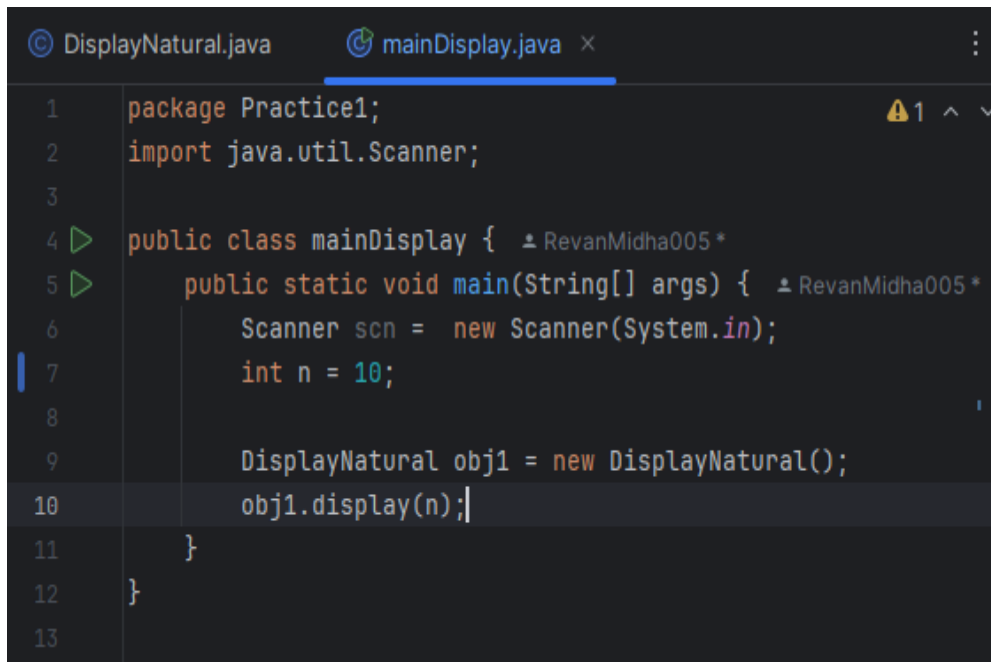# Assignment – 3

Practice Questions : 1

Q1) WAP to print first 10 natural numbers

CODE :

```java
package Practice1;

public class DisplayNatural {  2 usages   RevanMidha005
    void display(int n){  1 usage   RevanMidha005
        for (int i = 1; i <= n; i++){
            System.out.print(i + " ");
        }
    }
}
```

```java
package Practice1;
import java.util.Scanner;

public class mainDisplay {   RevanMidha005 *
    public static void main(String[] args) {   RevanMidha005 *
        Scanner scn =  new Scanner(System.in);
        int n = 10;

        DisplayNatural obj1 = new DisplayNatural();
        obj1.display(n);
    }
}
```

OUTPUT :

```
Run        □ mainDisplay  ×

G  ■  □ ⊕ ⊙  ⋮

     "C:\Program Files\Eclipse Adoptium\jdk
     1 2 3 4 5 6 7 8 9 10
     Process finished with exit code 0
```

HANDWRITTEN :

```
DisplayNatural.java

package Practice1;

public class DisplayNatural {
    void display (int n) {
        for (int i = 0; i <= n; i++) {
            Sysio (i + " ");
        }
    }
}
```

```
mainDisplay.java

package Practice1;
import java.util.Scanner;

public class mainDisplay {
    public static void main (String[] args) {
        Scanner scn = new Scanner (System.in);
        Sysoln ("Enter the number: ");
        int n = scn.nextInt();

        DisplayNatural obja = new DisplayNatural();
        obja.display (n);
    }
}
```
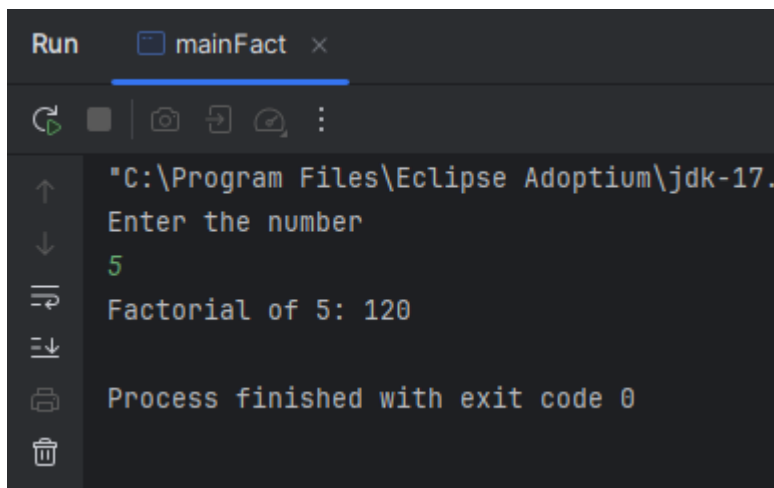
Spiral

Q2) WAP to print factorial of a number.

CODE :

```java
package Practice1;

public class Factorial {
    void fact(int n){
        int p = 1;
        for (int i = 1; i <= n; i++) {
            p *= i;
        }
        System.out.println("Factorial of " + n + ": " + p);
    }
}
```

```java
package Practice1;
import java.util.Scanner;

public class mainFact {
    public static void main(String[] args) {
        Scanner scn = new Scanner(System.in);
        System.out.println("Enter the number");
        int n = scn.nextInt();

        Factorial obj = new Factorial();
        obj.fact(n);
    }
}
```

OUTPUT :

```
Run      mainFact  ×

  "C:\Program Files\Eclipse Adoptium\jdk-17.
  Enter the number
  5
  Factorial of 5: 120

  Process finished with exit code 0
```

HANDWRITTEN :

```
Ans) factorial.java

package Practice1;

public class factorial {
    void fact(int n) {
        int p=1;
        for (int i=1; i<=n; i++) {
            p*=i;
        }
    }
}


mainfact.java

package Practice1;
import java.util.Scanner;

public class mainfact {
    public static void main (String[] args) {
        Scanner scn = new Scanner (System.in);
        Sysoln ("Enter the number:");
        int n= scn.nextInt();

        factorial obj = new factorial();
        obj.fact(n);
    }
}
```
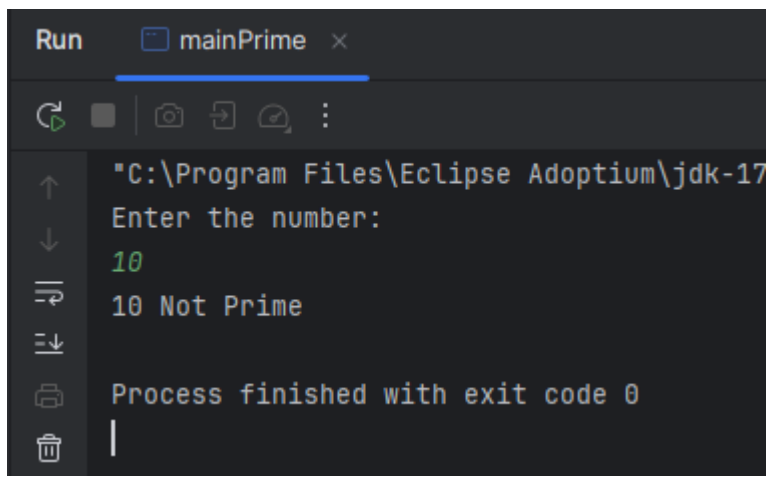
Q3) Check whether the given no is prime or not.

CODE :

```java
Prime.java ×    mainPrime.java

1    package Practice1;
2
3    public class Prime {  2 usages  ⚲ RevanMidha005
4        void isPrime(int n) {  1 usage   ⚲ RevanMidha005
5            if (n == 0 || n == 1){
6                System.out.println(n + " Not Prime");
7                return;
8            }
9
10           int sqr = (int)Math.pow(n, 0.5);
11
12           for (int i = 2; i <= sqr; i++) {
13               if (n % i == 0) {
14                   System.out.println(n + " Not Prime");
15                   return;
16               }
17           }
18           System.out.println(n + " Prime");
19       }
20   }
21
```
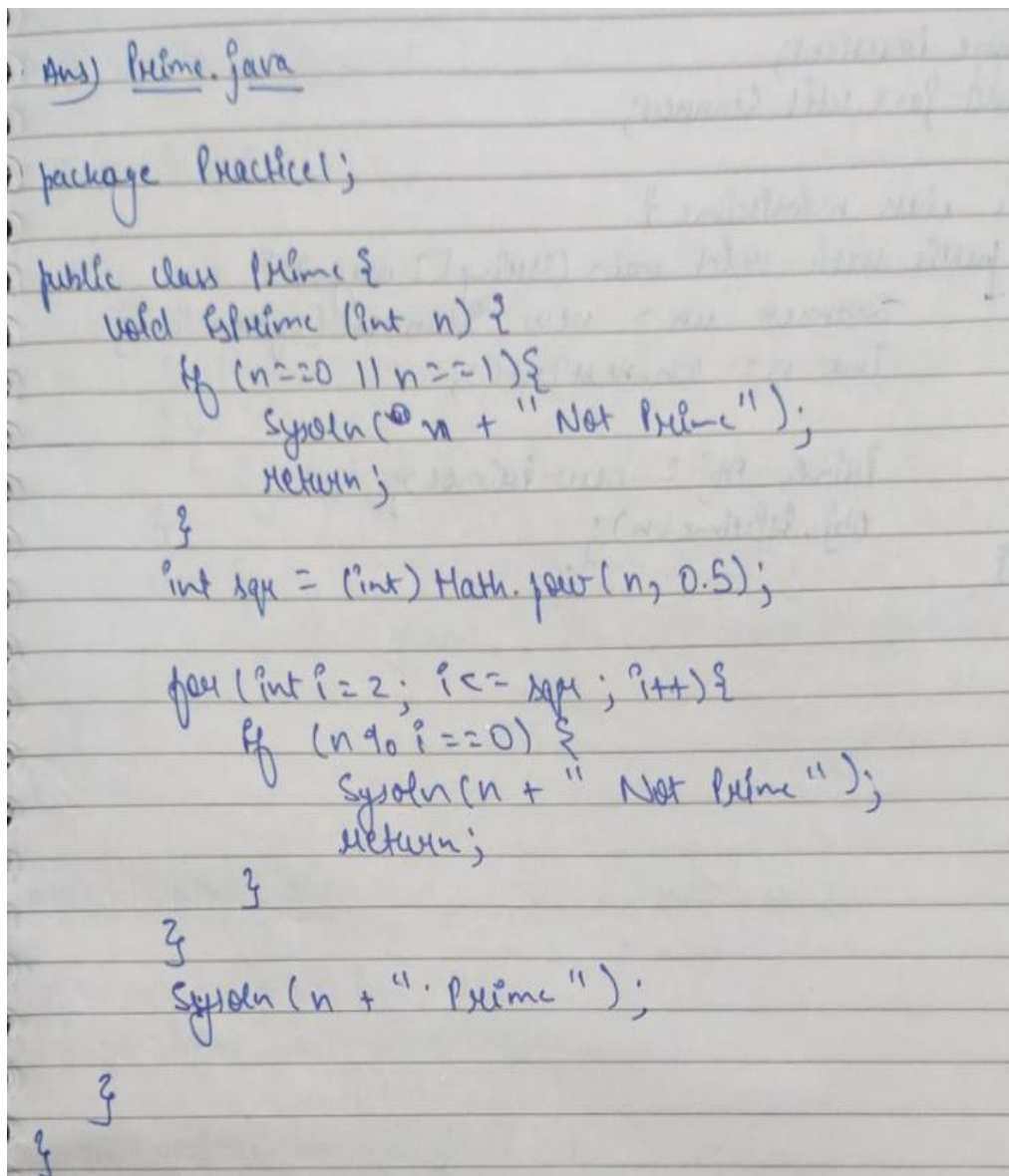
```java
Prime.java    mainPrime.java ×                    ⋮

1    package Practice1;
2    import java.util.Scanner;
3
4 ▷  public class mainPrime {  ⚲ RevanMidha005
5 ▷      public static void main(String[] args) {  ⚲ RevanMidha005
6            Scanner scn =  new Scanner(System.in);
7            System.out.println("Enter the number: ");
8            int n = scn.nextInt();
9
10           Prime obj3 = new Prime();
11           obj3.isPrime(n);
12       }
13   }
14
```

OUTPUT :

```
Run      mainPrime  ×

   "C:\Program Files\Eclipse Adoptium\jdk-17
   Enter the number:
   10
   10 Not Prime

   Process finished with exit code 0
```

HANDWRITTEN :

```
Ans) Prime.java

package Practicel;

public class Prime {
    void isPrime (int n) {
        if (n==0 || n==1){
            Sysoln (n + " Not Prime");
            return;
        }
        int squ = (int) Math.pow (n, 0.5);

        for (int i=2; i<= squ; i++){
            if (n %o i ==0) {
                Sysoln (n + " Not Prime");
                return;
            }
        }
        Sysoln (n + " Prime");

    }
}
```

mainPrime.java

```java
package Practice1;
import java.util.Scanner;

public class mainPrime {
    public static void main(String[] args) {
        Scanner scn = new Scanner(System.in);
        int n = scn.nextInt();

        Prime Obj = new Prime();
        Obj.isPrime(n);
    }
}
```

Q4) WAP to check whether given year is a leap year or not (including century checking).

CODE :

```java
package Practice1;

public class LeapYear {   2 usages   ± RevanMidha005
    void isLeap(int year) {   1 usage   ± RevanMidha005
        if (year % 4 == 0 && year % 100 != 0 || year % 400 == 0) {
            System.out.println(year + " is a Leap Year");
        }
        else {
            System.out.println(year + " is not a Leap Year");
        }
    }
}
```

```java
package Practice1;
import java.util.Scanner;

public class mainLeapYear {   ± RevanMidha005
    public static void main(String[] args) {   ± RevanMidha005
        Scanner scn = new Scanner(System.in);
        System.out.println("Enter the year: ");
        int year = scn.nextInt();

        LeapYear obj = new LeapYear();
        obj.isLeap(year);
    }
}
```

OUTPUT:

```
Run    ☐ mainLeapYear  ×

⟳ ■ | ◎ ⇥ ⌕ ⋮

↑    "C:\Program Files\Eclipse Adoptium\jdk-17
↓    Enter the year:
     2000
⇥    2000 is a Leap Year
⬇
     Process finished with exit code 0
🖨
🗑   |
```

HANDWRITTEN :

```
package Practice1;

public class leapyear {
    void is leap (int Year) {
        if ( year %  4 == 0 && year % 100 != 0 || year % 400 == 0)
        {
            Sysout (year + " is a leap year");
        }
        else {
            Sysout (year + " is not a leap year");
        }
    }
}

main leapYear.java.

package Practice1;
import java.util.Scanner;

public class mainleapYear {
    public static void main ( String[] args) {
        Scanner scu = new Scanner (System.in);
        Sysout (" Enter the year: ");
        int year = Scn. nextInt();

        leapyear obj = new leap Year();
        Obj. isleap();
    }
}
```
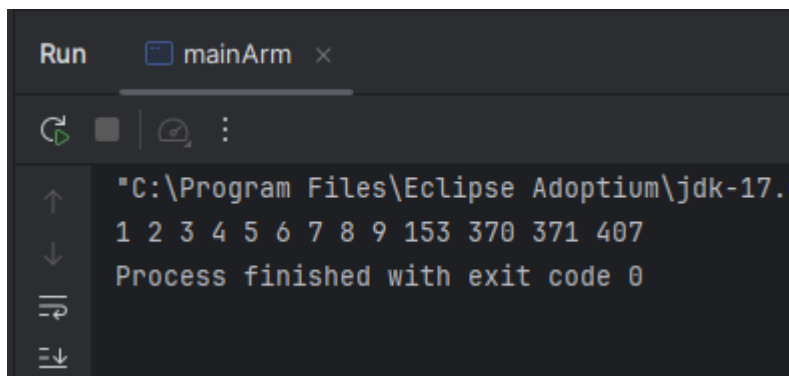
Spiral

Q5) WAP to print Armstrong number between 1 to 500.

CODE :

```java
package Practice1;

public class Armstrong {  2 usages  ± RevanMidha005 *
    void displayArmstrong(int n) {  1 usage  ± RevanMidha005
        int t = n, d, s = 0, c = 0;

        t = n;
        s = 0;
        c = 0;

        while (t != 0) {
            c += 1;
            t /= 10;
        }

        t = n;
        while (t != 0) {
            d = t % 10;
            s += (int) Math.pow(d, c);
            t /= 10;
        }

        if (s == n) {
            System.out.print(s + " ");
        }
    }
}
```
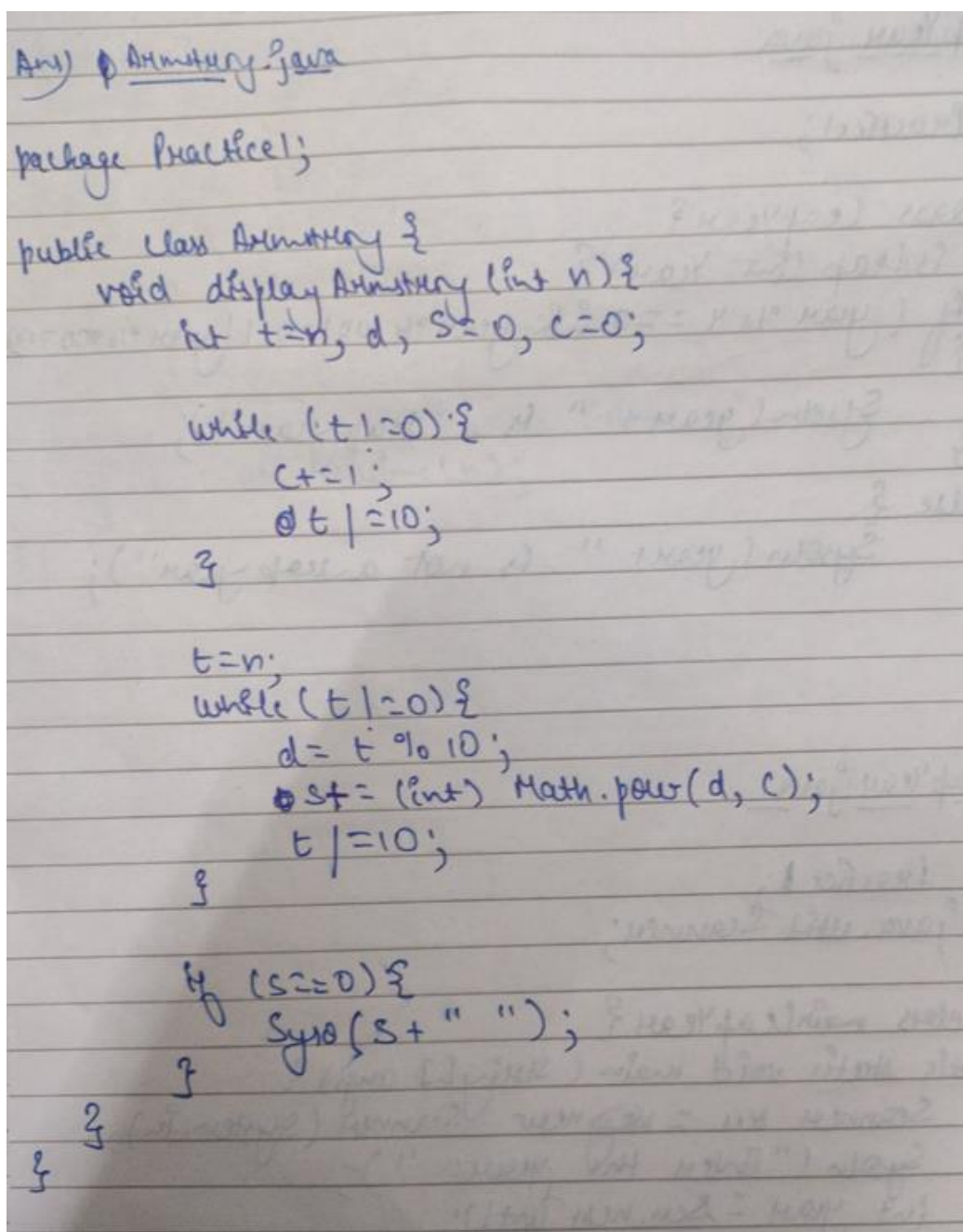
```java
package Practice1;

public class mainArm{  ± RevanMidha005 *
    public static void main(String[] args) {  ± RevanMidha005
        Armstrong obj = new Armstrong();

        for (int i = 1; i<= 500; i++){
            obj.displayArmstrong(i);
        }
    }
}
```

OUTPUT :

```
Run        mainArm  ×

  "C:\Program Files\Eclipse Adoptium\jdk-17.
  1 2 3 4 5 6 7 8 9 153 370 371 407
  Process finished with exit code 0
```

HANDWRITTEN :

Ans) ① Armstrong.java

package Practice1;

public class Armstrong {
  void displayArmstrong (int n) {
    int t=n, d, s=0, c=0;

      while (t1=0) {
        c+=1;
        t |=10;
      }

      t=n;
      while (t|=0) {
        d= t % 10;
        s+= (int) Math.pow(d, c);
        t |=10;
      }

      if (s==0) {
        Syso (s+ " ");
      }
  }
}

mainArm. java

package Practice1;

```java
public class mainArm {
    public static void main (String[] args) {
        Armstrong obj = new Armstrong ();

        for (int i=1; i<=500; i++) {

            obj.displayArmstrong ();
        }
    }
}
```

Q6) Pattern 1

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

CODE :

```java
package Practice1;
import java.util.Scanner;

public class Pattern1 {   ± RevanMidha005
    public static void main(String[] args) {   ± RevanMidha005
        Scanner scn = new Scanner(System.in);
        int n = scn.nextInt();

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

OUTPUT :

```
"C:\Program Files\Eclipse Adopt
5
1
2 2
3 3 3
4 4 4 4
5 5 5 5 5
```

HANDWRITTEN :

```
Pattern1.java

package Practice1;
import java.util.Scanner;

public class Pattern1 {
    public static void main( String [] args) {
        Scanner scn = new Scanner (System.in);
        int n = scn.nextInt();

        for (int i = 1; i <= n; i++) {
            for (int j = 1; j <= i; j++) {
                Syso(i + " ");
            }
            Sysoln();
        }
    }
}
```

Pattern 2

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

CODE :

```java
package Practice1;
import java.util.Scanner;

public class Pattern2 {                    ▲ RevanMidha005
    public static void main(String[] args) {    ▲ RevanMidha005
        Scanner scn = new Scanner(System.in);
        int n = scn.nextInt();

        for (int i = n; i >= 0; i--){
            for (int j = 1; j <= i; j++){
                System.out.print(i + " ");
            }
            System.out.println();
        }
    }
}
```

OUTPUT :

```
Run    Pattern2  ✕

"C:\Program Files\Eclipse
5
5 5 5 5 5
4 4 4 4
3 3 3
2 2
1
```

HANDWRITTEN :

```
pattern2.java

package Practicel;
import java.util.Scanner;

public class pattern2 {
    public static void main(String[] args) {
        Scanner sur = new Scanner(System.in);
        int n = sur.nextInt();

        for(int i=n; i>=1; i--) {
            for(int j=1; j<=i; j++) {
                Syso(i+" ");
            }
            Sysoln();
        }
    }
}
```

Pattern 3

1 2 3 4 5
1 2 3 4
1 2 3
1 2
1

CODE :

```java
package Practice1;
import java.util.Scanner;

public class Pattern3 {
    public static void main(String[] args) {
        Scanner scn = new Scanner(System.in);
        int n = scn.nextInt();

        for (int i = n; i >= 0; i--) {
            for (int j = 1; j <= i; j++) {
                System.out.print(j + " ");
            }
            System.out.println();
        }
    }
}
```

OUTPUT :

```
"C:\Program Files\Eclipse Ad
5
1 2 3 4 5
1 2 3 4
1 2 3
1 2
1
```

HANDWRITTEN :

```java
Pattern3.java

package Practice1;
import java.util.Scanner;

public class Pattern3 {
    public static void main(String[] args) {
        Scanner scn = new Scanner(System.in);
        int n = scn.nextInt();

        for(int i = n; i >= 1; i--) {
            for(int j = 1; j <= i; j++) {
                Syso(j + " ");
            }
            Sysoln();
        }
    }
}
```

Pattern 4

```
    1
   121
  12321
 1234321
123454321
```

CODE :

```java
package Practice1;
import java.util.Scanner;

public class Pattern4 {     RevanMidha005
    public static void main(String[] args) {     RevanMidha005
        Scanner scn = new Scanner(System.in);
        int n = scn.nextInt();
        int spaces = n-1;

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

OUTPUT :

```
"C:\Program Files\Eclips
5
    1
   121
  12321
 1234321
123454321
```

HANDWRITTEN :

```java
Pattern4.java

package practice1;
import java.util.Scanner;

public class Pattern4 {
    public static void main (String[] args) {
        Scanner sn = new Scanner (System.in);
        int n = sn.nextInt();
        int spaces = n-1;

        for (int i = 1; i <= n; i++) {
            for (int j = 1; j <= spaces; j++) {
                Syso(" ");
            }
            for (int k = 1; k <= i; k++) {
                Syso (k);
            }
            for (int l = i-1; l >= 1; l--) {
                Syso (l);
            }
            Sysoln ();
            spaces--;
        }
    }
}
```
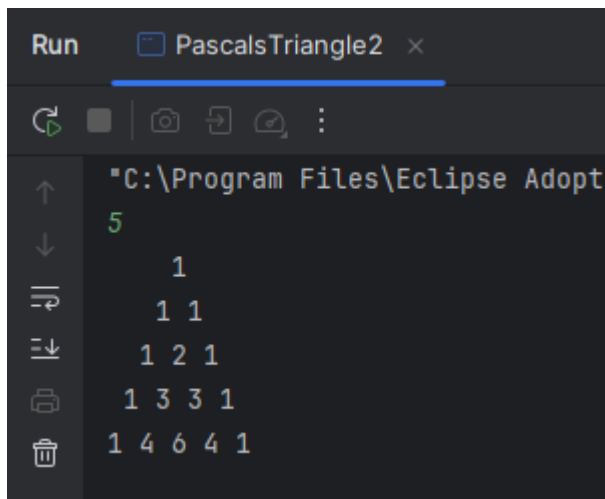
Spiral

Pattern 5
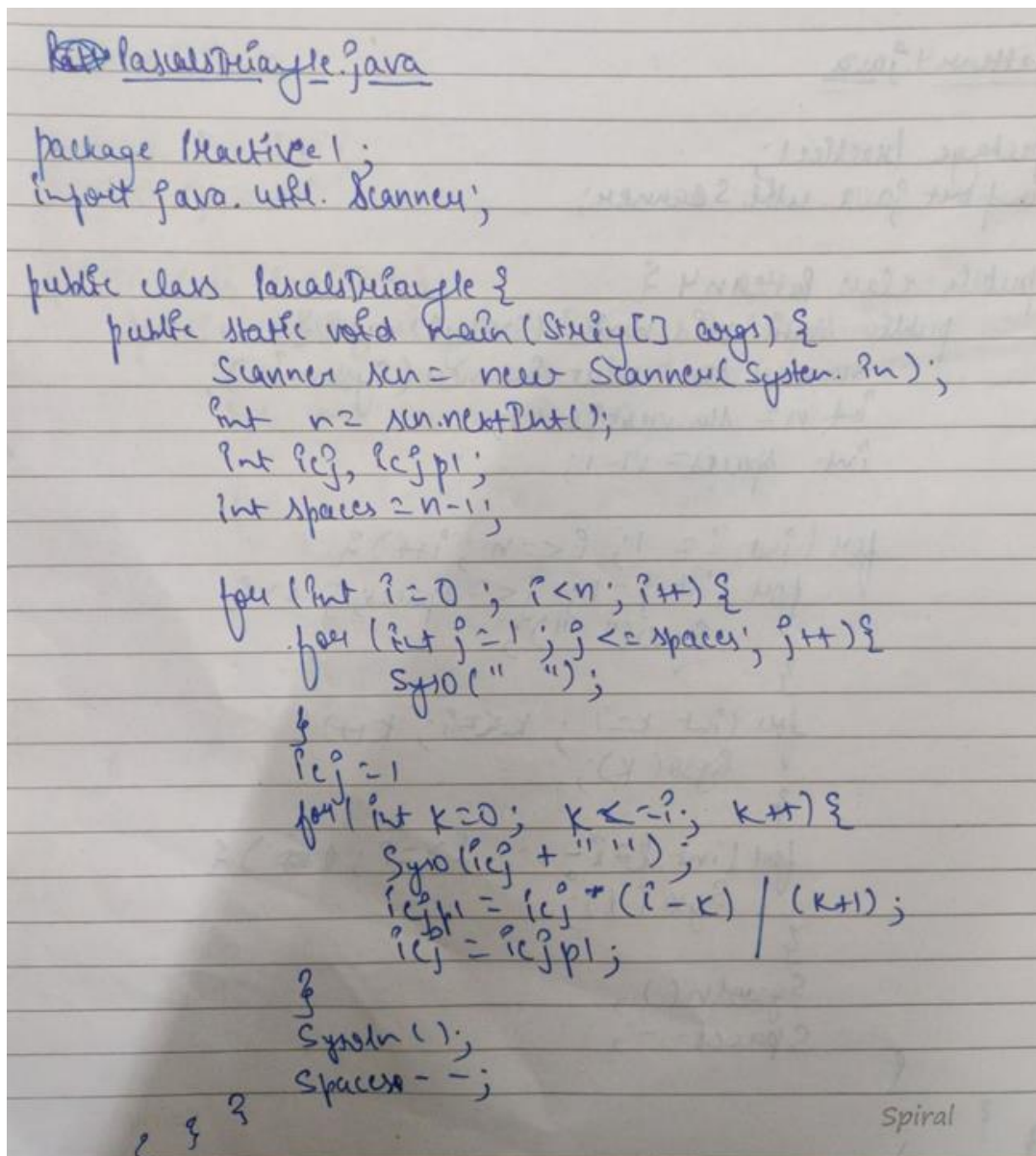**(Pascal's Triangle)**
```
    1  1
  1  2  1
 1  3  3  1
1  4  6  4  1
```

CODE :

PascalsTriangle2.java ✕

```java
1    package Practice1;
2    import java.util.Scanner;
3
4    public class PascalsTriangle2 {  ⊥ RevanMidha005
5        public static void main(String[] args) {  ⊥ RevanMidha005
6            Scanner scn = new Scanner(System.in);
7            int n = scn.nextInt();
8            int icj, icjp1;
9            int spaces = n - 1;
10
11           for (int i = 0; i < n; i++) {
12
13               for (int j = 1; j <= spaces; j++) {
14                   System.out.print(" ");
15               }
16               icj = 1;
17
18               for (int k = 0; k <= i; k++) {
19                   System.out.print(icj + " ");
20
21                   icjp1 = icj * (i - k) / (k + 1);
22                   icj = icjp1;
23               }
24               System.out.println();
25               spaces--;
26           }
27       }
28   }
```

OUTPUT :

```
Run      PascalsTriangle2  ✕

"C:\Program Files\Eclipse Adopt
5
    1
   1 1
  1 2 1
 1 3 3 1
1 4 6 4 1
```

HANDWRITTEN :

```java
PascalsTriangle.java

package Practice1;
import java.util.Scanner;

public class PascalsTriangle {
    public static void main(String[] args) {
        Scanner scn = new Scanner(System.in);
        int n = scn.nextInt();
        int icj, icjp1;
        int spaces = n-1;

        for (int i=0 ; i<n; i++) {
            for (int j=1 ; j <= spaces; j++) {
                syso(" ");
            }
            icj = 1
            for (int k=0; k<=i; k++) {
                syso(icj + " ");
                icjp1 = icj * (i-k) / (k+1);
                icj = icjp1;
            }
            sysln();
            spaces--;
        }
    }
}
```