5. Exercises on Nested - Loops

5.1 Square Pattern (nested - Loop)

```
import java.util.Scanner;

Public class SquarePattern {
    Public static void main(String args[]) {
        Scanner scan = new Scanner(System.in);
        System.out.print("Enter the size: ");
        int size = scan.nextInt();
        scan.close();

        for (int row = 1; row <= size; row++) {
            for (int col = 1; col <= size; col++) {
                System.out.print("#");
            }
            System.out.println();
        }
    }
}
```

output :

```
Enter the size : 5
# # # # #
# # # # #
# # # # #
# # # # #
# # # # #
```

ROLL NUMBER :

5.2 Checker Pattern (Nested - loop)

```
import java.util.Scanner;

public class CheckerPattern {
    Public static void main (string args[]) {
        Scanner scan = new scanner (System.in);
        System.out.print ("Enter the size: ");
        int size = scan.nextInt();
        Scan.close();

        for (int row = 1; row <= size; row++){
            if (row %2 == 0) {
                System.out.print("  ");
            }
            for (int col=1; col <= size; col++){
                System.out.print(" # ");
            }
            System.out.println();
        }
    }
}
```

output :

```
Enter the size: 7
# # # # # # #
  # # # # # # #
# # # # # # #
  # # # # # # #
# # # # # # #
  # # # # # # #
# # # # # # #
```

ROLL NUMBER :

5.3 TimeTable (nested loop)

```
import java.util.Scanner;
public class TimeTable{
    public static void main (String args[]){
        Scanner scan = new Scanner (System.in);
        System.out.print ("Enter th size:" );
        int size = scan.nextInt();
        scan.close();

        System.out.print ("*  \t | \t " );
        for (int i = 1; i <= size ; i++) {
            System.out.print (i + "\t");
        }
        System.out.println();
        for (int i =1 ; i <= size ; i++) {
            System.out.print ("- - —— — " );
        }
        System.out.println();

        for (int row =1 ; row <= size i row ++ ) {
            System.out.print (row + " \t | \t " );
            for (int col=1 ; col <= size ; col ++ ) {
                System.out.print (col * row + "\t");
            }
            System.out.println();
        }
    }
}
```

ROLL NUMBER :

Enter the size: 10

*	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

5.4 Triangular Pattern (nested-loop)

```
import java.util.Scanner;
public class TriangularPattern {
    public static void main(String args[]) {
        Scanner scan = new Scanner(System.in);
        System.out.print("Enter the size: ");
        int size = scan.nextInt();
        scan.close();
```

```
for (int row = 1; row <= size; row ++) {
    for (int col = 1; col <= row; col++) {
        System.out.print("#");
    }
    System.out.println();
} // Ist Bit - (a)

for (int row = 1; row <= size; row++) {
    for (int col = size; col >= row, col--) {
        System.out.print("# ");
    }
    System.out.println();
} // IInd Bit - (b)

for (int row = 1; row <= size; row ++) {
    for (int col = 1; col <= size; col++) {
        if (row < size && col <= (size - row)) {
            System.out.print("  ");
        }
        else {
            System.out.print("# ");
        }
    }
    System.out.println();
} // IVth Bit - (d)
```

```
for ( int row = 1 ; row <= size ; row++) {
    for (int col = 1 ; col <= size ; col++) {
        if (row > 1 + 1 && col < row) {
            System.out.print ("  ");
        } else {
            System.out.print ("# ");
        }
    }
    System.out.println ();
} // IIrd Bit - (c)
}
}
```

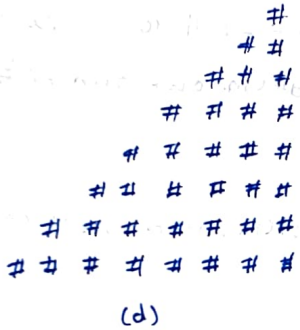
Output :

Enter the size : 8

(a)

(b)

(c)



(d)

ROLL NUMBER :

5.5 BoxPattern (nested-loop)

```
import java.util.Scanner;

public class BoxPattern {
    public static void main (String args[]) {

        Scanner scan = new Scanner( System.in);
        System.out.print ("Enter the size: ");
        int size = scan.nextInt();
        scan.close();
        // A bit
        for (int row =1; row <= size; row++){
            for (int col=1; col <=size; col++) {
                if (col == 1 || col== size || row==1 || row ==size ) {
                    System.out.print ("# ");
                } else {
                    System.out.print ("  ");
                }
            }
            System.out.println();
        }
        System.out.println();

        // Bit B
        for (int row = 1; row<= size; row++) {
            for (int col = 1; col<=size ; col++){
                if (row == 1 || row == size || row == col){
                    System.out.print("# ");
                }
                else {
                    System.out.print ("  ");
                }
            }
            System.out.println();
        }
```

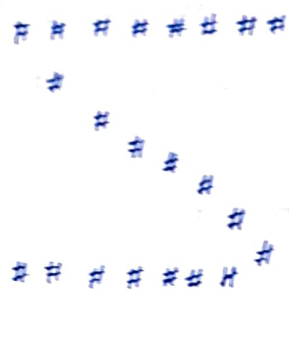
ROLL NUMBER :

```
// C Bit
for (int row = 1; row <= size ; row++){
    for (int col = 1; col <= size ; col ++){
        if (row == 1 || row == size || row+ col ==9 ){
            System.out.print ("# ");
        } else {
            System.out. print ("  ");
        }
    }
    System.out. println ();
}
// D Bit
for (int row = 1; row <= size; row++ ){
    for (int col = 1; col <= size; col++ ){
        if ( row == 1 || row == size || row == col || row+ col == 9 ){
            System.out. print ("# ");
        } else {
            System.out. print ("  ");
        }
    }
    System.out.println ();
}
// E Bit
for (int row = 1 ; row <= size ; row++){
    for ( int col = 1; col <= size ; col++ ){
        if (row == 1 || row == size || col == 1 ||col == size || row == col
            || row+ col == 9){
            System.out.print ("# ");
        } else {
            System.out. print ("  ");
        }
    }
    System.out. println();
}
```

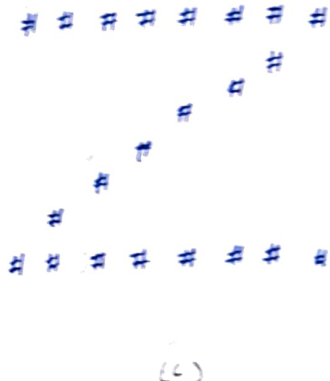
Output :

Enter no size : 8

(a)



(b)



(c)

(d)

(e)

5.6 Hill Pattern (nested-loop)

```
import java.util.Scanner;

public class HillPattern {
    public static void main (String args[]) {
        Scanner scan = new Scanner(System.in);
        System.out.print("Enter no rows: ");
        int size = scan.nextInt();
        scan.close();
```

ROLL NUMBER :

```
// A Bit
for(int row = 1; row <= size; row++){
    for (int col = 1; col <= (size*2); col++) {
        if((row + col >= size + 1) && (row >= col - size + 1)){
            System.out.print("# ");
        } else {
            System.out.print("  ");
        }
    }
    System.out.println();
}

// B Bit
for(int row = 1; row <= size; row++){
    for (int col = 1; col <= (size*2); col++){
        if (col >= row && col <= (size*2)-row)) {
            System.out.print("# ");
        } else {
            System.out.print("  ");
        }
    }
    System.out.println();
}

// C Bit
for (int row = 1; row <= size; row++){
    for (int col=1; col <= (size*2); col++){
        if ((row + col >= size*+1) && (row>= col-size+1)){
            System.out.print("# ");
        } else {
            System.out.print("  ");
        }
    }
    System.out.println();
}
```

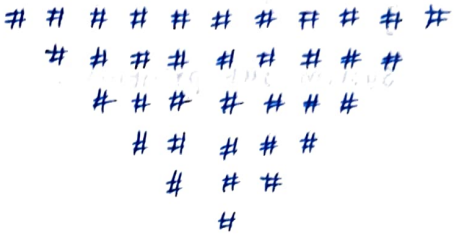
```
for ( int row = 2 ; row <= size ; row++) {
    for (int col = 1 ; col <=(size * 2) ; col++ ) {
        if ( col >= row && col <=(size*2) - row)) {
            System.out.print ("#  ");
        } else {
            System.out.print ("  ");
        }
    }
    System.out.println();
}

// D Bit

for (int row = 0; row <= size ; row++){
    System.out.print ("#  ");
    for (int col = 1 ; col <=(size* 2); col++) {
        if ((row +col >= size+1) && (row>= col - size+1) ) {
            System.out.print ("  ");
        } else {
            System.out.print ("# ");
        }
    }
    System.out.println();
}
for ( int row = 2 ; row <= size+1}; row ++) {
    System.out.print ("#  ");
    for ( int col = 1; col <= (size* 2); col++) {
        if (col >= row && col <= ((size*2)-row)){
            System.out.print ("  ");
        } else {
            System.out.print ("# ");
        }
    }
    System.out.println();
}
```

ROLL NUMBER :

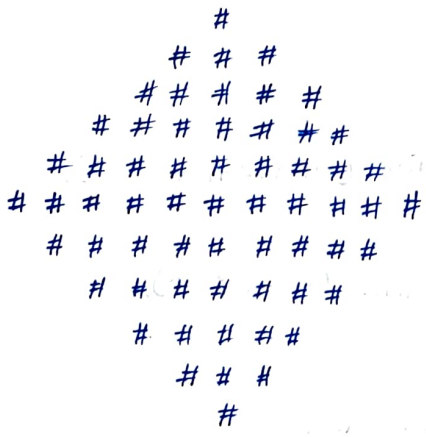
Output:

Enter th rows : 6

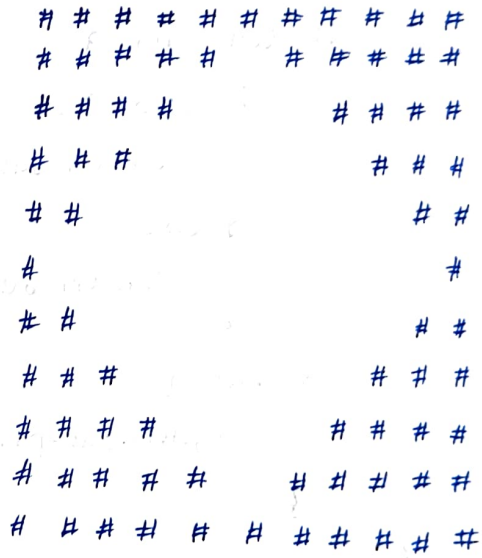
(a)



(b)



(c)



(d)

5.7 Number Pattern (nested-loop)

```
import java.util.Scanner;

public class NumberPattern {
    public static void main(String args[]){
        Scanner scan = new Scanner(          )
        System.out.print("Enter th size : ");
        int size = scan.nextInt();
        Scan.close();
```

ROLL NUMBER :

```
// A Bit
for (int row=1; row<=size; row++) {
    for (int col=1; col<=row; col++) {
        System.out.print(col + " ");
    }
    System.out.println();
}

// B bit
for (int row=1; row<=size; row++){
    for (int col=1; col<=size; col++) {
        if (col>=row){
            if (row>1){
                System.out.print(col-row+1 + " ");
            } else {
                System.out.print(col + " ");
            }
        } else {
            System.out.print("  ");
        }
    }
    System.out.println();
}

// C Bit
for (int row=1; row<=size; row++){
    for (int col=size; col>=1; col--){
        if (col<=row){
            System.out.print(col + " ");
        } else{
            System.out.print("  ");
        }
    }
    System.out.println();
}
```

ROLL NUMBER :

```
// D Bit
for (int row = 1; row <= size ; row++){
    for (int col = size; col >= row; col--) {
        System.out.print(col-row+1+" ");
    }
    System.out.println();
}
}
}
```

Output :

Enter the size : 8

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
1 2 3 4 5 6
1 2 3 4 5 6 7
1 2 3 4 5 6 7 8
```

(a)

```
1 2 3 4 5 6 7 8
  1 2 3 4 5 6 7
    1 2 3 4 5 6
      1 2 3 4 5
        1 2 3 4
          1 2 3
            1 2
              1
```

(b)

```
          1
        2 1
      3 2 1
    4 3 2 1
  5 4 3 2 1
6 5 4 3 2 1
7 6 5 4 3 2 1
8 7 6 5 4 3 2 1
```

(c)

```
8 7 6 5 4 3 2 1
7 6 5 4 3 2 1
6 5 4 3 2 1
5 4 3 2 1
4 3 2 1
3 2 1
2 1
1
```

(d)