

Java - Introduction to Programming

Lecture 5

Patterns - Part 1

1.



```
import java.util.*;

public class Patterns {
    public static void main(String args[]) {
        int n = 5;
        int m = 4;
        for(int i=0; i<n; i++) {
            for(int j=0; j<m; j++) {
                System.out.print("*");
            }
            System.out.println();
        }
    }
}
```

2.



```
import java.util.*;

public class Patterns {
    public static void main(String args[]) {
        int n = 5;
        int m = 4;
        for(int i=0; i<n; i++) {
            for(int j=0; j<m; j++) {
                if(i == 0 || i == n-1 || j == 0 || j == m-1) {
                    System.out.print("*");
                } else {
                    System.out.print(" ");
                }
            }
            System.out.println();
        }
    }
}
```

3.



```
import java.util.*;

public class Patterns {
    public static void main(String args[]) {
        int n = 4;

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

4.

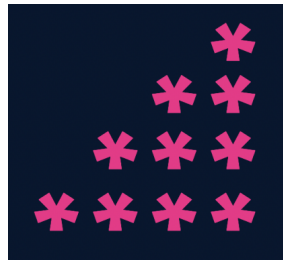


```
import java.util.*;

public class Patterns {
    public static void main(String args[]) {
        int n = 4;

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

5.



```
import java.util.*;

public class Patterns {
    public static void main(String args[]) {
        int n = 4;

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

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

6.

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

```
import java.util.*;

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

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

7.

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

```
import java.util.*;

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

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

8.

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

```
import java.util.*;

public class Patterns {
    public static void main(String args[]) {
        int n = 5;
        int number = 1;

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


9.

```
1
0 1
1 0 1
0 1 0 1
0 1 0 1 0
```

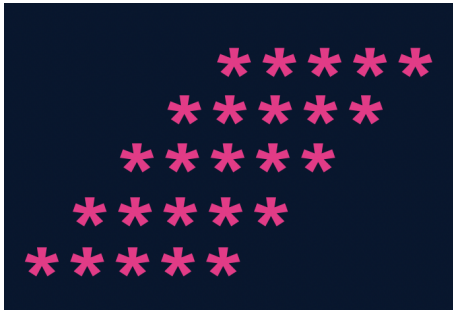
```
import java.util.*;

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

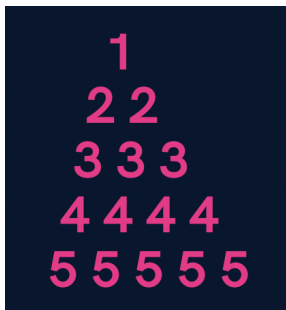
        for(int i=1; i<=n; i++) {
            for(int j=1; j<=i; j++) {
                if((i+j) % 2 == 0) {
                    System.out.print(1+" ");
                } else {
                    System.out.print(0+" ");
                }
            }
            System.out.println();
        }
    }
}
```

Homework Problems (Solutions in next Lecture's Video)

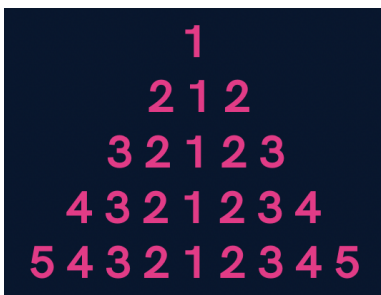
1. Print a solid rhombus.



2. Print a number pyramid.



3. Print a palindromic number pyramid.



Homework Solution (Lecture 4)

1. Print all even numbers till n.

```
1. public class Solutions {  
2.     public static void main(String args[]) {  
3.         int n = 25;  
4.  
5.         for(int i=1; i<=n; i++) {  
6.             if(i % 2 == 0) {  
7.                 System.out.println(i);  
8.             }  
9.         }  
10.     }  
11. }  
12.
```

3. Make a menu driven program. The user can enter 2 numbers, either 1 or 0.
If the user enters 1 then keep taking input from the user for a student's marks(out of 100).

If they enter 0 then stop.

If he/ she scores :

Marks >=90 -> print "This is Good"

89 >= Marks >= 60 -> print "This is also Good"

59 >= Marks >= 0 -> print "This is Good as well"

Because marks don't matter but our effort does.

(Hint : use do-while loop but think & understand why)

```
import java.util.*;

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

        do {
            int marks = sc.nextInt();
            if(marks >= 90 && marks <= 100) {
                System.out.println("This is Good");
            } else if(marks >= 60 && marks <= 89) {
                System.out.println("This is also Good");
            } else if(marks >= 0 && marks <= 59) {
                System.out.println("This is Good as well");
            } else {
                System.out.println("Invalid");
            }

            System.out.println("Want to continue ? (yes(1) or no(0))");
            input = sc.nextInt();

        } while(input == 1);
    }
}
```

Qs. Print if a number n is prime or not (Input n from the user).

[In this problem you will learn how to check if a number is prime or not]

```
import java.util.*;

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

        boolean isPrime = true;
        for(int i=2; i<=n/2; i++) {
```

```
        if(n % i == 0) {
            isPrime = false;
            break;
        }
    }

    if(isPrime) {
        if(n == 1) {
            System.out.println("This is neither prime not composite");
        } else {
            System.out.println("This is a prime number");
        }
    } else {
        System.out.println("This is not a prime number");
    }
}
}
```