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## Patterns and Programs

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How to print Ascii Values in Java:

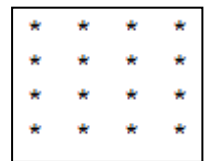
```
//Ascii is of 7 bits
//So range 2^7=128
//Range from 0 to 127
for (int i = 0; i <= 127; i++) {
    // %d numeric Values
    // %c character Values
    // printf for printing a format
    System.out.printf("%d : %c \n", i, i);
}
```

Output Format:

```
33 : !
34 : "
35 : #
36 : $
37 : %
38 : &
39 : '
40 : (
```

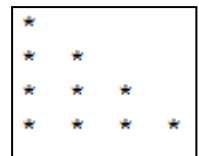
Pattern 1:

```
for (int i = 0; i < 4; i++) {
    for (int j = 0; j < 4; j++) {
        System.out.print(" * ");
    }
    System.out.println();
}
```



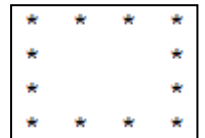
Pattern 2:

```
for (int i = 0; i < 4; i++) {
    for (int j = 0; j <= i; j++) {
        System.out.print(" * ");
    }
    System.out.println();
}
```



Pattern 3:

```
for (int i = 1; i <= 4; i++) {
    for (int j = 1; j <= 4; j++) {
        if (j==1 || j==4 || i==1 || i==4) {
            System.out.print(" * ");
        } else {
            System.out.print("   ");
        }
    }
    System.out.println();
}
```



#### Pattern 4:

```
//Column
for (int i = 1; i <=4; i++) {
    //Row
    for (int j = 1; j <=4; j++) {
        System.out.print(j+" ");
    }
    System.out.println();
}
```

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

#### Pattern 5:

```
//Column
for (int i = 1; i <=4; i++) {
    //Row
    for (int j = 1; j <=4; j++) {
        System.out.print(i+" ");
    }
    System.out.println();
}
```

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

#### Pattern 6:

```
//Column
for (int i = 1; i <=4; i++) {
    //Row
    for (int j = 1; j <=4; j++) {
        int k=i+j-1;
        if(k>4)
            System.out.print(k-4+" ");
        else
            System.out.print(k+" ");
    }
    System.out.println();
}
```

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

#### Pattern 7:

```
//Column
for (int i = 1; i <=4; i++) {
    //Row
    for (int j = 1; j <=i; j++) {
        int k=i+j;
        if(k%2==0)
            //Even Number the addition of i & j
            System.out.print(1+" ");
        else
            System.out.print(0+" ");
    }
    System.out.println();
}
```

1
0 1
1 0 1
0 1 0 1

#### Pattern 8:

```
//Column
for (int i = 1; i <=4; i++) {
    //Row
    for (int j = 1; j <=i; j++) {
        System.out.print(i+" ");
    }
    System.out.println();
}
```

1
2 2
3 3 3
4 4 4 4