Java - Introduction to Programming
Lecture 4

Loops

A loop is used for executing a block of statements repeatedly until a particular condition is satisfied. A loop consists of an initialization statement, a test condition and an increment statement.

For Loop

The syntax of the for loop is :

```
for (initialization; condition; update) {
 // body of-loop
}
```

```java
for (int i=1; i<=20; i++) {
   System.out.println(i);
}
```

While Loop

The syntax for while loop is :

```
while(condition) {
 // body of the loop
}
```

```java
int i = 0;
while(i<=20) {
   System.out.println(i);
   i++;
}
```

Do-While Loop

The syntax for the do-while loop is :

```
do {
 // body of loop;
}
while (condition);
```

```java
int i = 0;
do {
   System.out.println(i);
```

```
    i++;
} while(i<=20);
```

Homework Problems

1. Print all even numbers till n.
2. Run

```
for(; ;) {

            System.out.println("Apna College");

        }
```

loop on your system and analyze what happens. Try to think of the reason for the output produced.

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)

BONUS

Qs. Print if a number 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]

Homework Solution (Lecture 3)

```java
import java.util.*;

public class Conditions {
   public static void main(String args[]) {
       Scanner sc = new Scanner(System.in);
       int a = sc.nextInt();
       int b = sc.nextInt();
       int operator = sc.nextInt();

       /**
        * 1 -> +
        * 2 -> -
        * 3 -> *
        * 4 -> /
        * 5 -> %
        */

       switch(operator) {
           case 1 : System.out.println(a+b);
           break;
           case 2 : System.out.println(a-b);
           break;
           case 3 : System.out.println(a*b);
           break;
           case 4 : if(b == 0) {
                       System.out.println("Invalid Division");
                   } else {
                       System.out.println(a/b);
                   }
           break;
           case 5 : if(b == 0) {
                       System.out.println("Invalid Division");
                   } else {
                       System.out.println(a%b);
                   }
           break;
           default : System.out.println("Invalid Operator");
       }
   }
```

```
}
```

Loops

for Loop

while Loop

do while Loop

```
for(initialisation; condition; updation) {

//do something

}
```

```
for(initialisation; condition; updation) {

//do something

}
```

int counter = 0

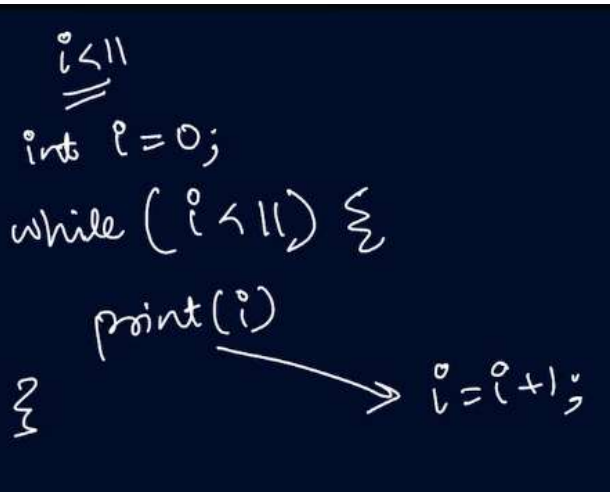
counter < 100

counter = counter + 1

```
while(condition) {

//do something

}
```




do {
//do something
} while(condition);

Qs. Print the Sum of First n Natural Numbers.

n = 4

Qs. Print the Sum of First n Natural Nu

n = 4

1 + 2 + 3 + 4 = 10

```
int sum = 0;
for( int i = 1 ; i <= n ; i++)
{
    sum = sum + i
}
print (sum)
```

1 2 3 ... n

Print the table of a number input by the user.

n = 2

2x1
2x2
2x3
2x4
2x5
2x6
2x7
2x8
2x9
2x10

update by 1

```
for( int i=1 ; i<11; i++ ){
  print(n*i);
}
```

1 → n
2 → 2xn
3 → 3xn