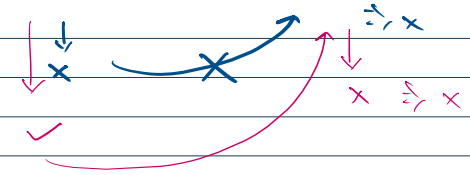
Logical operators

to determine the logic, by combining multiple conditions

&& Logical and

returns true only if both conditions are true

x < 5 && x > 10



x = 7

x = 4

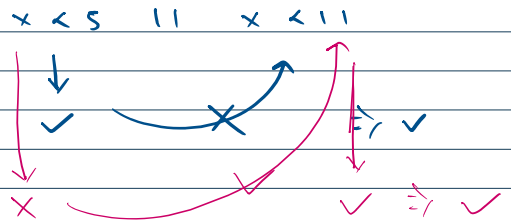
cond 1	cond 2	cond 1 && cond 2
T	T	T
T	F	F
F	F	F
F	F	F

|| Logical OR

returns true if one of the condition is true

cond 1	cond 2	cond 1 || cond 2
T	T	T
T	F	T
F	T	T
F	F	F

x < 5 || x < 11



x = 4

x = 6

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

        int x = 4;
        System.out.println(x < 5 && x
< 11 && x < 100);

        x = 11;
        System.out.println(x < 5 || x
< 11);

        System.out.println(!(x < 5));

    }
}
```

! Logical Not

reverse the result.

Cond	!Cond
T	F
F	T

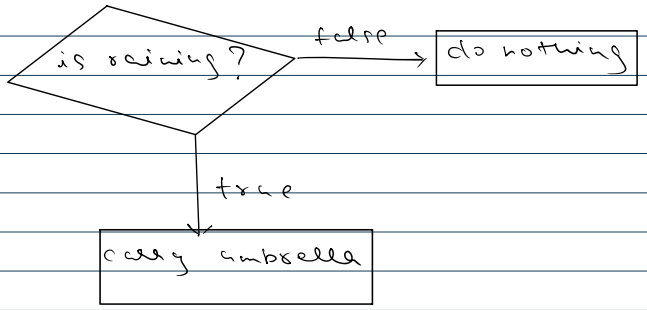
Conditional Statements

Decision making statements

they let you control the flow of program.

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

        // if (condition){
        //     // code 1
        // }
        // else{
        //     // code 2
```

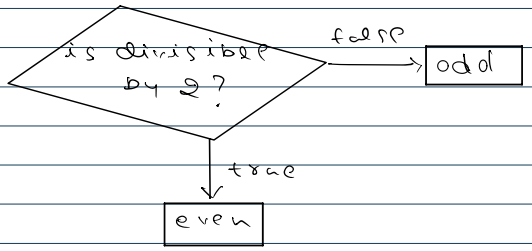
they let you control the flow of program.



A num is given, check whether it is odd or even?

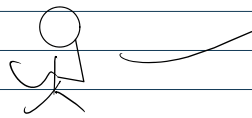
4 → even → divisible by 2 ⇒ 4%2 == 0

7 → odd → not divisible by 2 ⇒ 7%2 != 0




```
// }
// else{
//     // code 2
// }

int n = 2;

if(n%2 == 0){
    System.out.println("even");
}
else{
    System.out.println("odd");
}

System.out.println("Hello Akarsh");

if(n > 3){
    System.out.println("Bye Akarsh");
}
System.out.println("Ok Akarsh");

    }
}
```

Report card



75 → ⇒ Grade A

65 - 75 ⇒ B

55 - 65 ⇒ C

45 - 55 ⇒ D

0 - 45 ⇒ Fail

if

↓

false → else if

↓

false → else if

↓

false → else

if → true ⇒ control out of loop

if

↓

false → else if → true

↓

control out of loop

45 - 55 (range is 45 to 55)

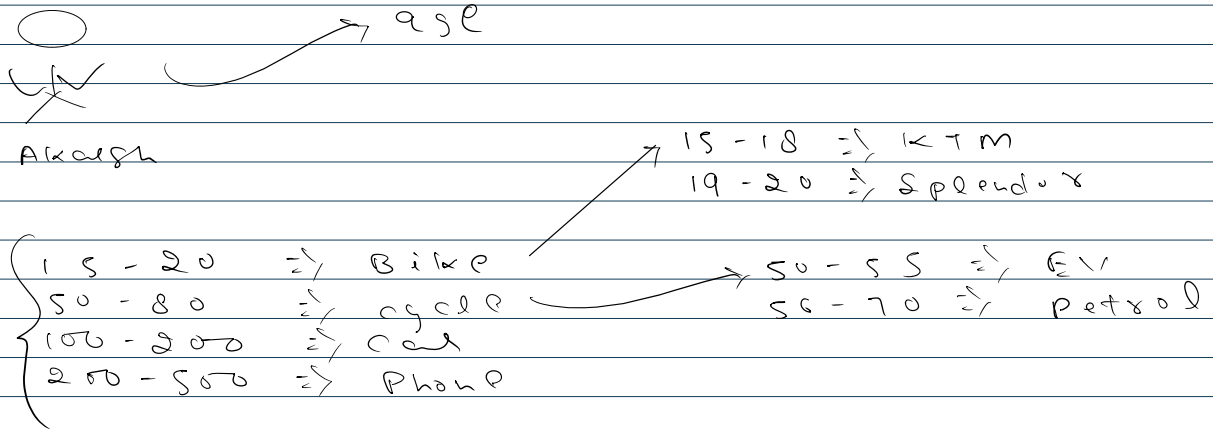
↳ marks > 45

&&

marks < 55

```java
public class Main {
    public static void main(String[] args) {

        int marks = 1;

        if(marks > 75){
            System.out.println("Grade A");
        }
        else if(marks >= 65 && marks <= 75){ // marks = [65-75] or 65 <= marks <= 75
            System.out.println("Grade B");
        }
        else if(marks >= 55 && marks < 65){ // marks = [65-75] or 65 <= marks <= 75
            System.out.println("Grade C");
        }
        else if(marks >= 45 && marks < 55){ // marks = [65-75] or 65 <= marks <= 75
            System.out.println("Grade D");
        }
        else{
            System.out.println("Grade F");
        }

        System.out.println("Report Card Generated!");

    }
}
```

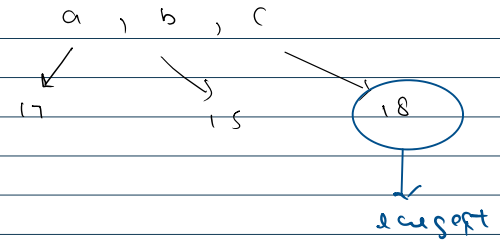
Nested if-else




```java
public class Main {
    public static void main(String[] args) {

        int age = 52;

        if(age >= 15 && age <= 20){
            System.out.println("Bike");

            if(age >= 15 && age <= 18){
                System.out.println("KTM");
            }
            else{
                System.out.println("Splendor");
            }
```

```
        }
        else if(age >= 50 && age <= 80){
            if(age >= 50 && age <= 55){
                System.out.println("Petrol");
            }
            else if(age >= 56 && age <= 70){
                System.out.println("EV");
            }
        }

    }
}
```

Maximum among three numbers



a :- a > b && a > c

b :- b > c && b > a

c :- c > a && c > b

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

        // int a = 10;
        // int b = 20;
        // int c = 30;

        int a = 10, b = 20, c = -30;

        if(a > b && a > c){
            System.out.println("a");
        }
        else if(b > c && b > a){
            System.out.println("b");
        }
        else{
            System.out.println("c");
        }
    }

}
```

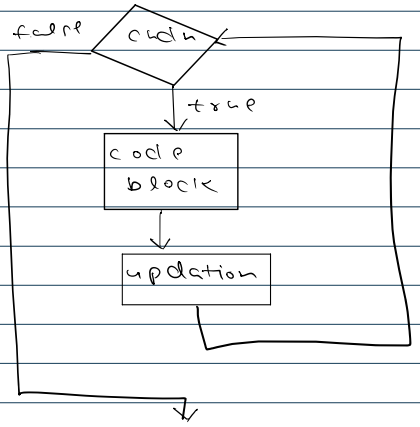
Loops

to execute a block of code as long as specified condition is true.

Hello Akarsh

→ Print 5 times

```
while (condition) {
    // code block
    updation
}
```




```java
int i = 0;
while(i < 5){
    // code block
    System.out.println("Hello Akarsh");

    // updation
    i++;
}
```

control

i = ~~0~~ ~~1~~ ~~2~~ ~~3~~ ~~4~~ 5

Hello
Hello
Hello
Hello
Hello

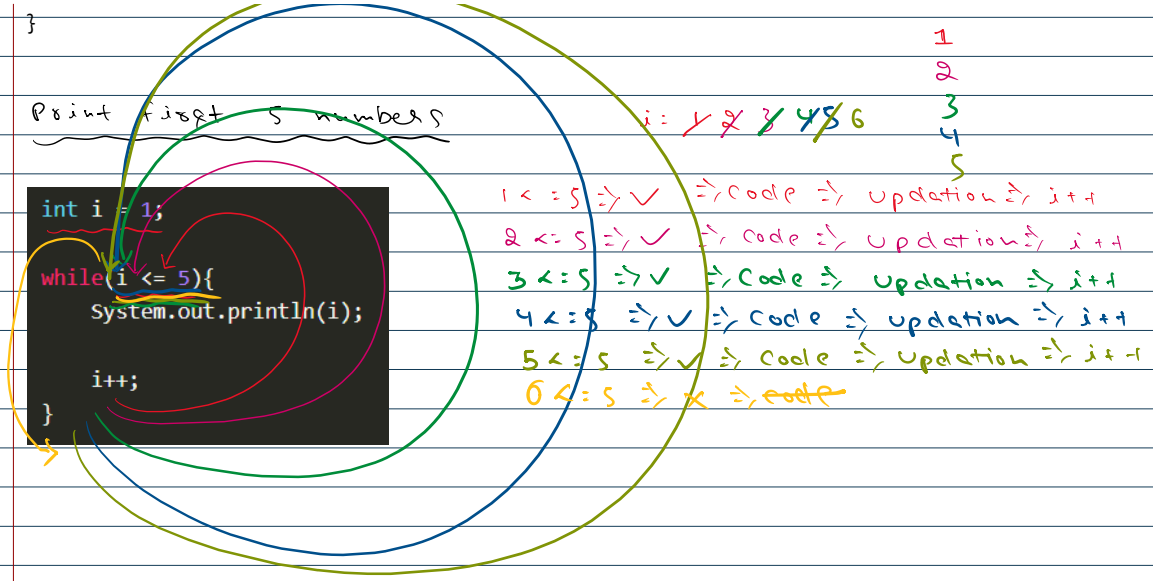
0 < 5 ⇒ ✓ ⇒ code ⇒ updation
1 < 5 ⇒ ✓ ⇒ code ⇒ updation
2 < 5 ⇒ ✓ ⇒ code ⇒ updation
3 < 5 ⇒ ✓ ⇒ code ⇒ updation
4 < 5 ⇒ ✓ ⇒ code ⇒ updation
5 < 5 ⇒ x ⇒ ~~code~~

```java
public class Main {
    public static void main(String[] args) {

        // System.out.println("Hello Akarsh");
        // System.out.println("Hello Akarsh");
        // System.out.println("Hello Akarsh");
        // System.out.println("Hello Akarsh");
        // System.out.println("Hello Akarsh");

        int i = 0;

        while(i < 5){

            // code block
            System.out.println("Hello Akarsh");

            // updation
            i++;
        }


    }
}
```

1
2
3

}

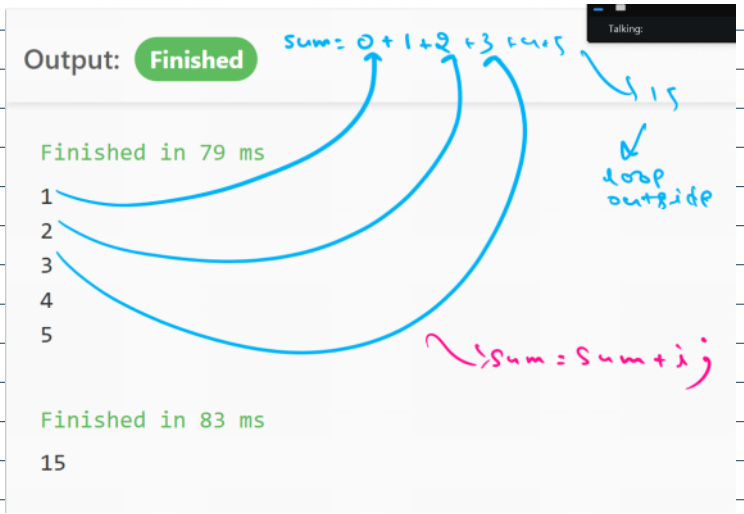
Print first 5 numbers




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

        int i = 1;

        while(i <= 5){
            System.out.println(i);

            i++;
        }


    }
}
```

Print sum of first 5 numbers

```
public class Main {
    public static void main(String[] args) {
        int sum = 0;
        int i = 1;

        while(i <= 5){
            // System.out.println(i);
            sum = sum + i;

            i++;
        }
        System.out.println(sum);


    }
}
```



Find simple interest

principle
rate of interest
time

$$\frac{p * r * t}{100}$$

```
public class Main {
    public static void main(String[]
args) {
        int p = 10000;
        float r = 7.531f;
        int t = 2;

        float si = (p * r * t) / 100;

        System.out.println(si);


    }
}
```