The beauty of Loops In Java!

What is Loops?

In programming languages, loops are used to execute a set of instructions/functions repeatedly when some conditions become true. Java provides three ways for executing the loops.

While all the ways provide similar basic functionality, they differ in their syntax and condition checking time.

Why should we use Loops?

-It helps executing 1 or more statements as you need it too. Instead of manually we can save time with Loops.

There are three main types of loops in java.

- for loop
- while loop
- do-while loop

Simple/Traditional For Loop

The Java for loop is a control flow statement that iterates a part of the programs multiple times.

Programming concept which allows us to execute certain set of block of code/statements within the given condition

We can initialize the variable, check condition and increment/decrement value.

Syntax & Example

Syntax /Example:

```
for(int i =1; i<=10; i++){

System.out.print(i);
```

Output:

```
1 2 3 4 5 6 7 8 9 10
```

1. **(i=1) Initialization**: It is the initial condition which is executed once when the loop starts. Here, we can initialize the variable, or we can use an already initialized variable.
2. **(i<=10) Termination Condition**: It is the second condition which is executed each time to test the condition of the loop. It continues execution until the condition is false. It must return boolean value either true or false.
3. **Statement**: The statement of the loop is executed each time until the second condition is false.
4. **(i++) Update = Increment/Decrement**: It increments or decrements the variable value.

Reverse String

```
String word = “Hello”;

String result =””;

for(int i=(word.length()-1); i>=0; i--){

result +=word.charAt(i);

}

System.out.println(result));
```

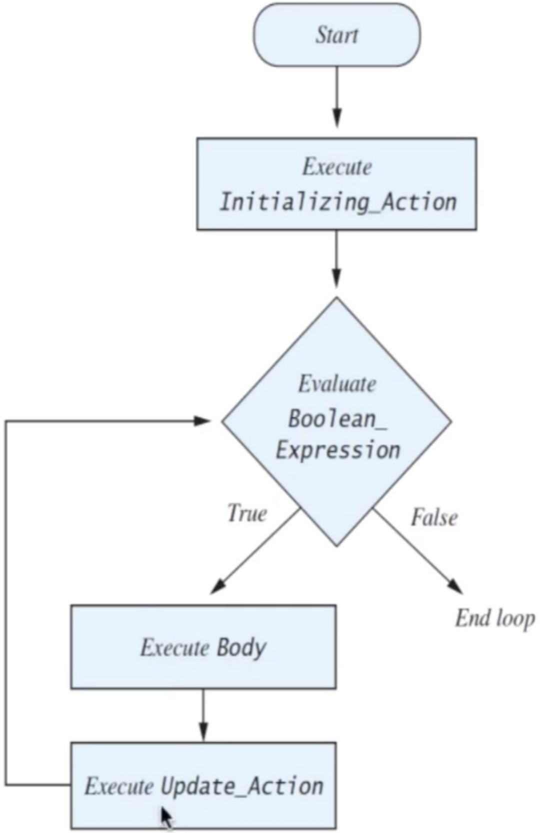
Output:

```
olleH
```

FLowChart

```
for(initialization;condition;incr/decr){

//statement or code

}
```

```
for (Initializing_Action; Boolean_Expression; Update_Action)
    Body
```



Nested Loop

-If we have a for loop inside the another loop, it is known as nested for loop.

Example

Task: Print out **unique characters** and count how many there are.

What is While Loop?

While loop repeatedly executes same set of statements as long as condition is true

-----Condition is checked at loop start--------

--------In the While loop, amount of iteration will be dynamic.(Constant change);

The code that is repeated in a loop is called the body of the loop.

Each repetition of the loop body is called an iteration of the loop.

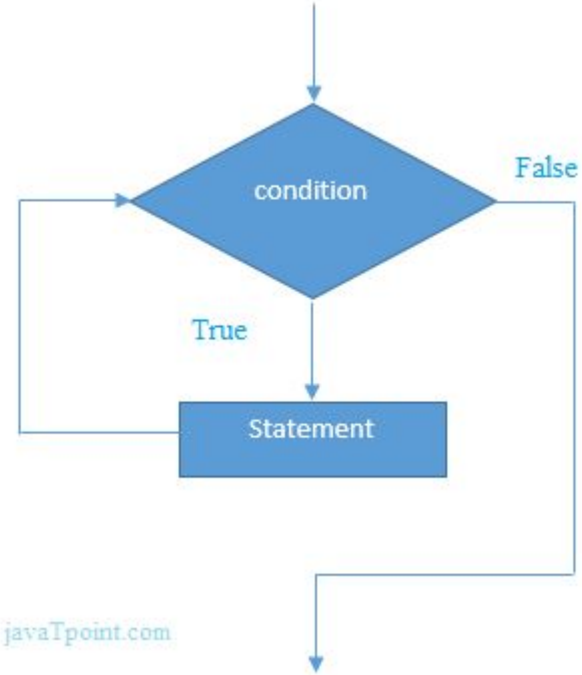
FLowChart

While (condition){ ↞-When execution

//keep doing this; reaches this line, it

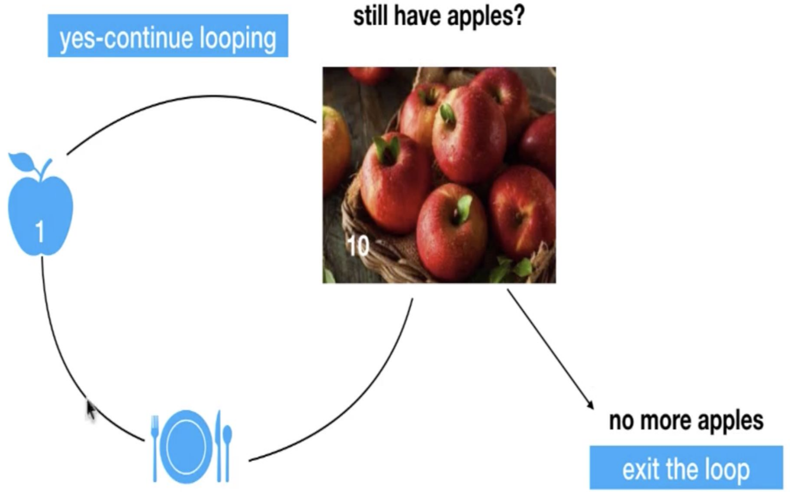
} checks the boolean Cond.

//if the condition is true it will enter the (loop-Body)



Simple Example:

```
int apples =1;

while(apples <= 10){

System.out.println(“Eating an apple”);

apples++;

}

System.out.println(“No More Apples :(“);
```



Example

ArmStrong Number?

- is a **number** that is equal to the sum of cubes of its digits. For example 0, 1, 153, 370, 371 and 407 are the **Armstrong numbers**.

Task: Checking to see how 153 is An ArmStrong Number.

Java Do-While Loop

Control flow statement that **executes** a part of the programs at least once and the further execution depends upon the given boolean condition.

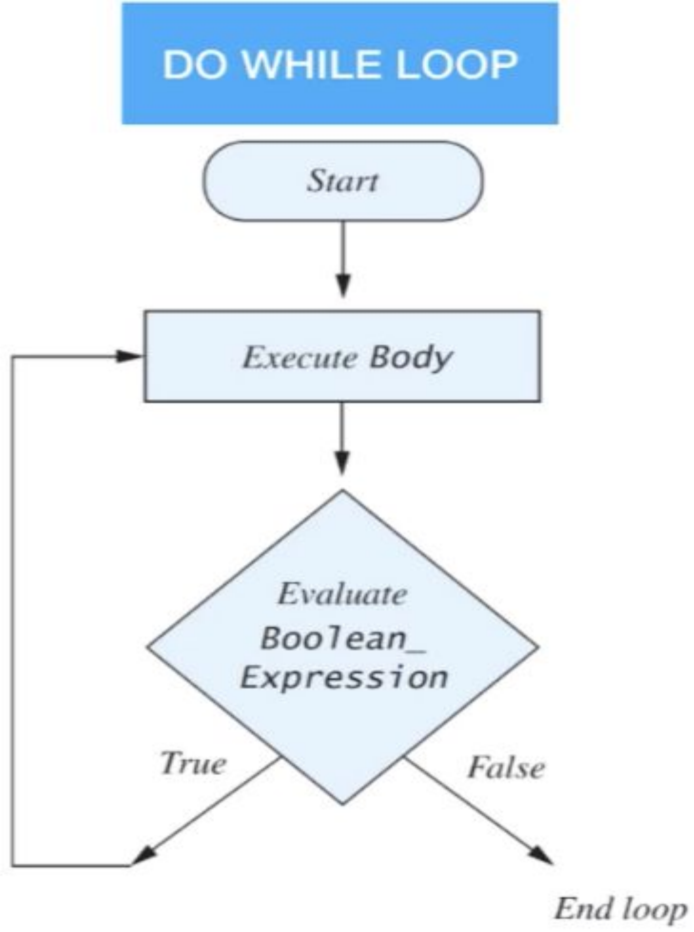
-Similar to the while loop, but the do-While loop will execute the given statements at least one time, **then it will check the boolean expression to evaluate if the loop should continue.**

Executed at least once because condition is checked after loop body…..

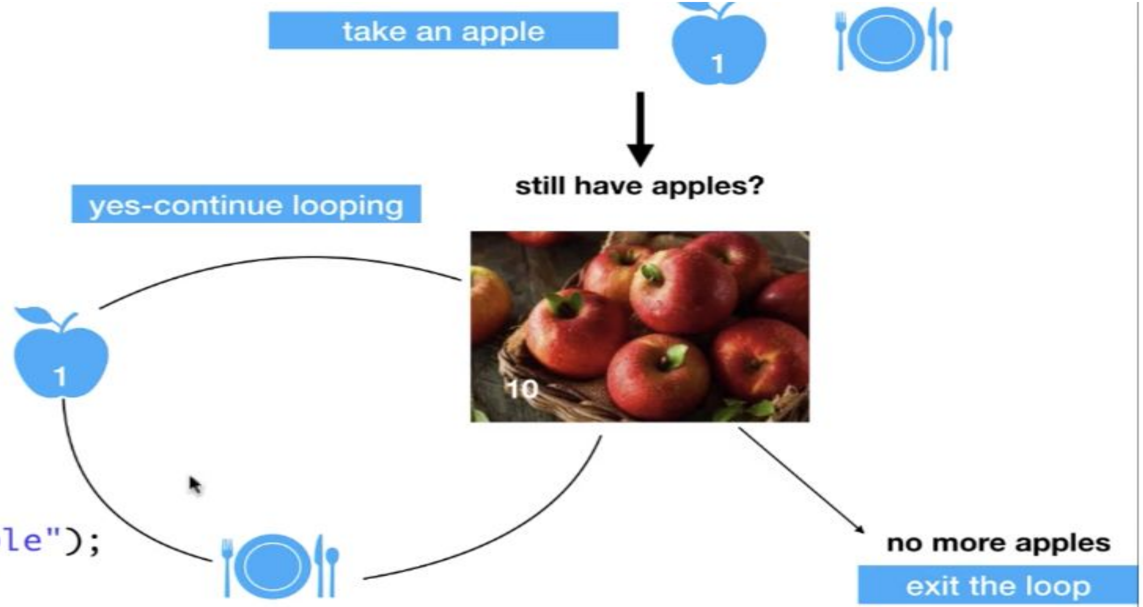
Simply:Do Something, While something is True:-

FlowChart

```
Do{

//code to be executed

}while(condition/boolean);
```



Simple Example



take an apple

still have apples?

yes-continue looping

no more apples

exit the loop

```
int apples = 1;

do{
  System.out.println("Eating an apple");
  apples++;
}while(apples <= 10);

System.out.println("No More Apples :(");
```

Example:

```
Int num =1;

Do{

System.out.print(num);

Num++;

}while(num<=10);

}

}
```

Output:

```
1 2 3 4 5 6 7 8 9 10
```

شكراً جزيلاً
рахмат
danke
謝謝
ngiyabonga
teşekkür ederim
Баярлалаа
mersi
kia ora
barka
welalin
spas
tack
mahalo
tapadh leat
спасибо
faafetai lava
vinaka
спасибі
blagodaram
dank je
misaotra
matondo
paldies
grazzi
gracias
kiitos
dankie
nanni
nandri
dhanyavad
хвала
asante
manana
obrigada
tenki
bedankt
bayarlalaa
gràçie
hvala
maururu
köszönöm
thank you
akun
dankon
aciū
enkosi
djiere dieuf
tau
mochchakkeram
murakoze
chokrane
dziękuję
дякую
mamnun
chnorakaloutioun
gratias ago
gràcies
sulpáy
taiku
go raibh maith agat
sobodi
dėkuji
obrigado
sagolun
sukriya
kop khun krap
arigatô
takk
dakujem
trugarez
mèsi
didi madloba
najis tuke
ありがとう
tanemirt
grazie
shukriya
mercé
мерси
kam sah hamnida
rahmat
terima kasih
rahmet
ευχαριστώ
diolch
dhanyavadagalu
merci
তোমাকে ধন্যবাদ
감사합니다
xièxie