# For Loop

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# Learning Object

- Repetition Statement
- For Loop
  - Flow of For Loop
  - Increase and decrease for counter
  - Step size of counter
- For each
  - Array and ArrayList

# Repetition Statements

- In a program, repetition statements control a block of code to be executed for many times
- Fixed number of times
  - "**for**" loop
  - "**for each**" loop
- Until a certain condition is met
  - "**while**" loop
  - "**do-while**" loop

# For Loop

- The syntax for the for loop is as follows:

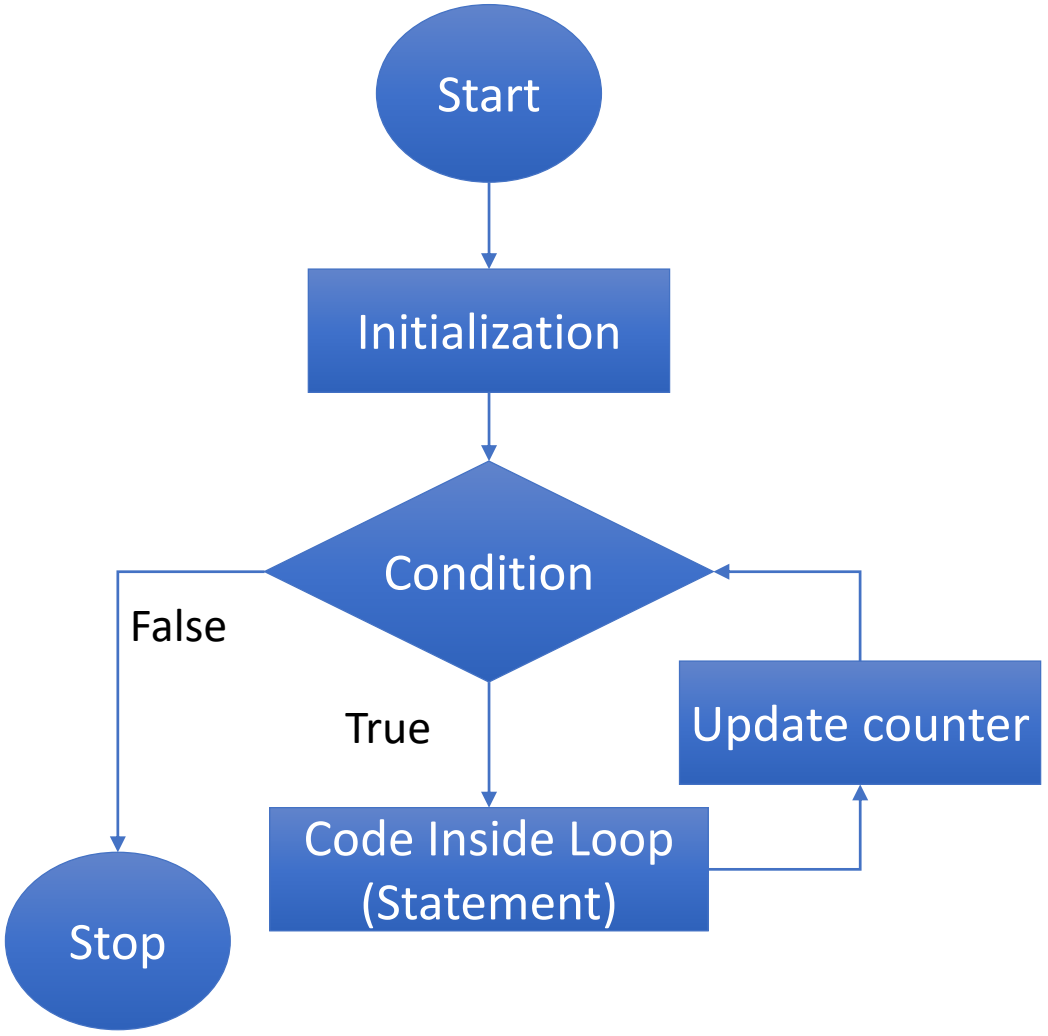
```
for(initialization; condition;  in/decrement){
        statement;
}
```


- Useful for counter-controlled loop
- **No semic**olon after the update expression or after “)”
- Example:

```
String[] numbers = {"one", "two", "three"};
for(int i=0; i<numbers.length; i++) {
        System.out.println(numbers[i]);
}
```

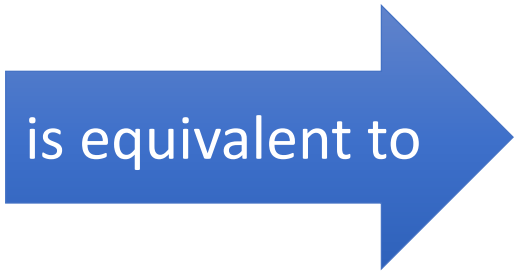
# Flow of For Loop

1. Perform *Initialization*
2. *Evaluate Boolean expression*
   - ❑ *If true, execute statement*
   - ❑ *Update counter, then re-evaluate Boolean expression*
   - ❑ *If false, terminate loop*



# Increase and Decrease for counter

```
count = count+1;
count = count-1;
```




```
count++;
count--;
```

| Operator | Meaning |
|---|---|
| i++ | Add 1, return the old value |
| ++i | Add 1, return the new value |
| i-- | Sub 1, return the old value |
| --i | Sub 1, return the new value |

# Step Size for the Update

- It could be a value greater than 1
  - Example, we need to compute summation of even numbers from 0 to 100

```
for(int i=0; i<=100; i+=2){
        sum += i;
}
```

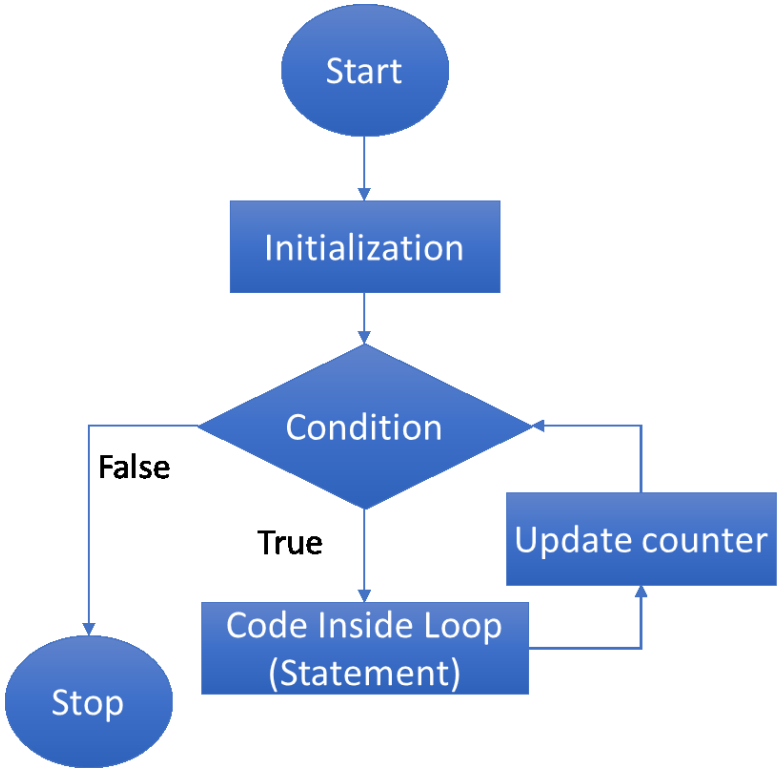
- It could be a negative value
  - Print even numbers from 0 to 100 in the decreasing order

```
for(int i=100; i>=0; i-=2){
        sum += i;
}
```

# For Loop with continue and break

- Continue: go to “condition”
- Break: go out to for loop
- Example:

```
int[] marks = {90, 25, 6[illegible]45, 80};
for(int i=0; i<marks.length; i++) {
        if (marks[i] < 60) { continue; }
        System.out.println((i+1)+" index is passed exam");
}
```



# For Each Statement

- The syntax for the for each loop is as follows:

```
for(type variable; iterate){
        statement;
}
```

- Normally the iterate is array and ArrayList
- Access one by one in an array following by index order
- Example:

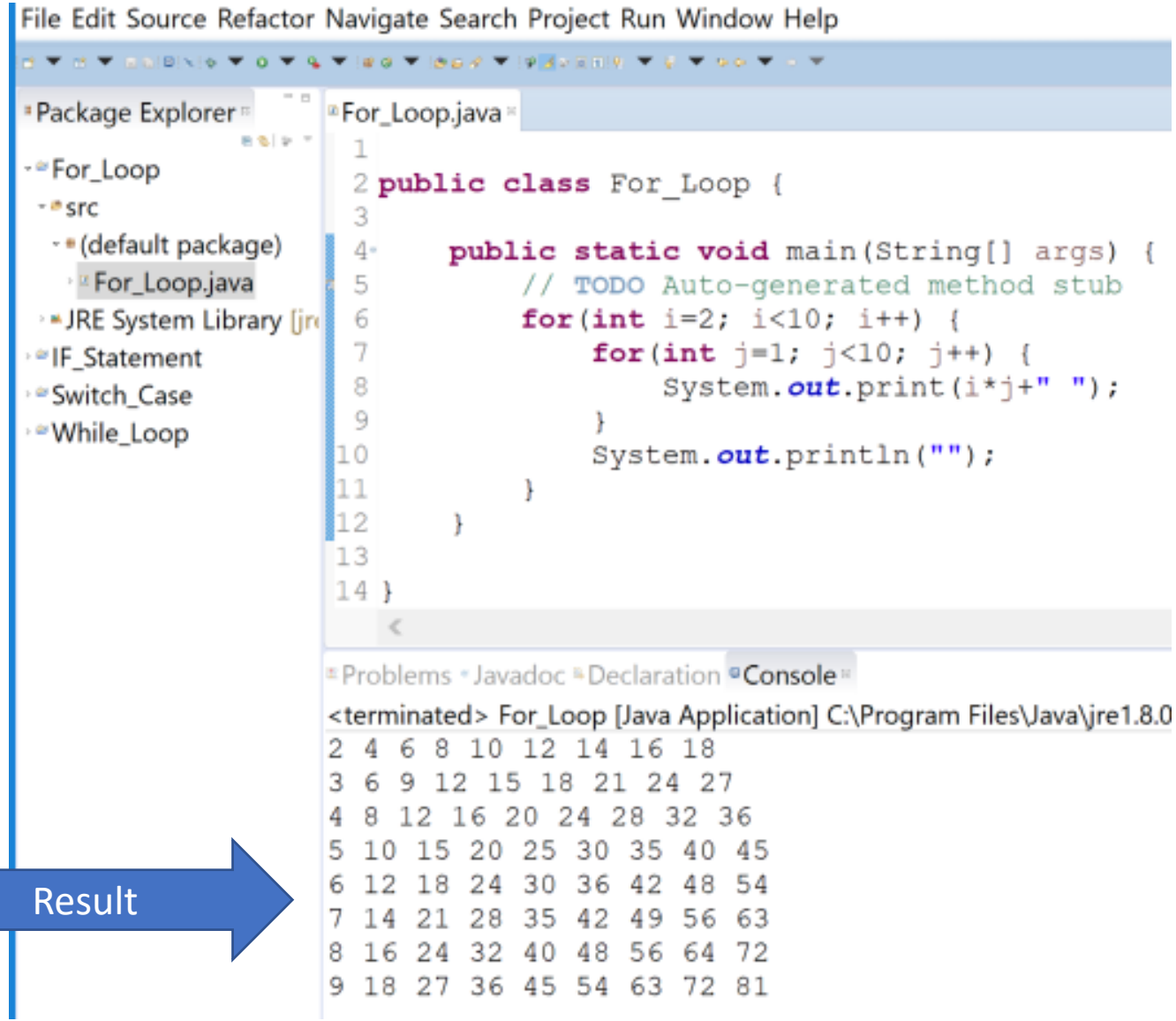
```
String[] numbers = {"one", "two", "three"};
for(String number: numbers) {
        System.out.println(number);
}
```

# Practice

1. Make a new project (Reference: Create Project and Class File)
   - ❑Project name: For_Loop
2. Create a new Class File
   - ❑Class name: For_Loop
3. Coding: (times table)

```
public class For_Loop {
	public static void main(String[] args) {
		for(int i=2; i<10; i++) {
			for(int j=1; j<10; j++) {
				System.out.print(i*j+" ");
			}
			System.out.println("");
		}
	}
}
```

# Practice – Code and Result




Result

# Summary

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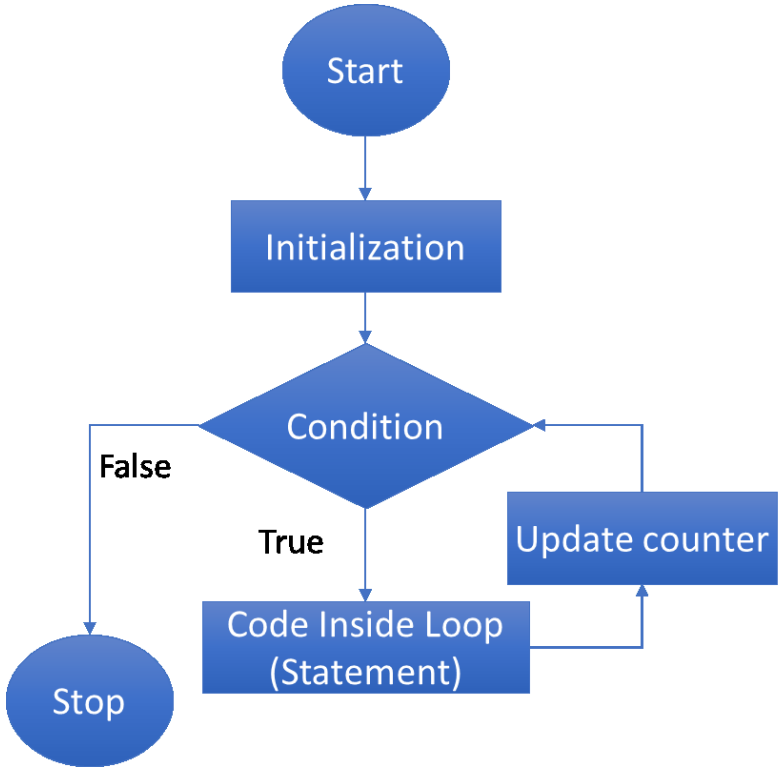


```
2 public class For_Loop {
3     public static void main(String[] args) {
4         // TODO Auto-generated method stub
5         for(int i=2; i<10; i++) {
6             for(int j=1; j<10; j++) {
7                 System.out.print(i*j+" ");
8             }
9             System.out.println("");
0         }
1     }
2 }
```