



# Iteration in Pseudocode and JavaScript

*for... while... do-while...*







# Iteration in Pseudocode

for:



The cat will say “meow” `for` 10 times.



Could you step forward `for` 5 times?

while:



I will continue my game `while` you are sleeping.







I will continue to eat `while` I am still hungry.

- `for` is for iteration that we know exactly how many times it will run.
- `while` is for iteration that we do not know how many times it will run. But one thing we know is the condition for it to stop.
- `do-while` is almost the same as `while`, but with one exception which will be explained latter.

# Why Iteration?

- We programmers adhere to **DRY (Don't Repeat Yourself)** doctrine religiously,
- Not using iteration leads you to:
  - Hard to maintain code,
  - Error prone code.
- Imagine the scenario below when you do not use iteration:

```
(client)   - display "meow" on the screen for 172 times  
(  you  )  - okay  
(client)   - hmm maybe display it for 321 times instead  
(  you  )  - ... okay... (endless copy-pasting hell)
```

# for Examples

1. INIT `times` AS NUMBER WITH VALUE OF 5  
FOR `loop` FROM 0 TO `times`  
    DISPLAY 'meow'  
END FOR
2. INIT `times` AS NUMBER WITH VALUE OF 10  
FOR `loop` FROM 1 TO `times`  
    IF `loop` MORE THAN EQUAL 5  
        DISPLAY `loop`  
    END IF  
END FOR

# while Examples

```
1.  INIT times AS NUMBER WITH VALUE OF 5
    WHILE times MORE THAN EQUAL 0
      DISPLAY 'meow'
      DECREMENT times
    END WHILE
```

```
2.  INIT a AS NUMBER WITH ANY VALUE
    WHILE TRUE
      IF a MODULUS 100 EQUAL TO 0
        DISPLAY a
        BREAK
      ELSE
        INCREMENT a
      END IF
    END WHILE
```

→  
Same?

```
INIT a AS NUMBER WITH ANY VALUE
WHILE TRUE
  IF a MODULUS 100 EQUAL TO 0
    DISPLAY a
    BREAK
  END IF
  INCREMENT a
END WHILE
```



# do-while Examples (1)

```
INIT times AS NUMBER WITH VALUE OF 5
DO
  DISPLAY 'meow'
  DECREMENT times
WHILE times MORE THAN EQUAL 0
```

Same?



```
INIT times AS NUMBER WITH VALUE OF 5
WHILE times MORE THAN EQUAL 0
  DISPLAY 'meow'
  DECREMENT times
END WHILE
```

## do-while Examples (2)

```
INIT times AS NUMBER WITH VALUE OF -1
DO
  DISPLAY 'meow'
  DECREMENT times
WHILE times MORE THAN EQUAL 0
```

Same?



```
INIT times AS NUMBER WITH VALUE OF -1
WHILE times MORE THAN EQUAL 0
  DISPLAY 'meow'
  DECREMENT times
END WHILE
```



# for Iteration in JavaScript

```
for (let i = 0; i < 10; i++) {  
    // Statements to execute  
}
```

# for Iteration in JavaScript

```
for (let i = 0; i < 10; i++) {  
  // Statements to execute  
}
```

Initial Expression

Condition

Increment Expression

Statements to execute

Initial Expression, Condition, and Increment  
Expression are optional

# while Iteration in JavaScript

```
while (conditions) {  
    // Statements to execute  
}
```

# while Iteration in JavaScript

```
while (conditions) {
```

```
// Statements to execute
```

```
}
```

**Statements to execute**

**Conditions**

# do-while Iteration in JavaScript

```
do {  
    // Statements to execute  
} while (conditions);
```



# do-while Iteration in JavaScript

```
do {
```

```
// Statements to execute
```

**Statements to execute**

```
} while (conditions);
```

**Conditions**