

Python-Java Comparison Sheet

If-statements

Python	Java
<ul style="list-style-type: none">● Use:<ul style="list-style-type: none">○ “if” at the beginning of the header for if statments○ “elif” for else-if statements○ “else” for else statements● Header ends with “:”● Body of if-statement must be indented● Use == for “equals” (NOT =) ● General structure:<ul style="list-style-type: none">○ if condition1: do stuff if condition1 is true do this too since indentedelif boolean2: do this stuff if condition1 is false and condition2 is trueelse: do this stuff if all the conditions in the previous statements were false● More information:<ul style="list-style-type: none">○ http://www.tutorialspoint.com/python/python_if_else.htm	<ul style="list-style-type: none">● Use:<ul style="list-style-type: none">○ Use “if” for if statments○ Use “else if” for else-if statments○ Use “else” for else statements● Use “()” parentheses around the condition of your if statement● Indentation of body is not necessary to execute (but creates clean, easy to read code)<ul style="list-style-type: none">○ Use “{ }” around the body of the if-statement● Use == for “equals” (NOT =) ● General Structure:<ul style="list-style-type: none">○ if (condition1){ do stuff inside brackets if condition1 is true } else if (condition2){ do this stuff if condition1 is false but condition2 is true } else { do this stuff if all the conditions in the previous statements were false }● More Information:<ul style="list-style-type: none">○ http://www.tutorialspoint.com/java/if_else_statement_in_java.htm

Python Code Example - If Statements

Code:

```
CalculatePay.py ✕
1  hoursWorked = float(input("How many hours did you work? "))
2  moneyEarned = 0
3  hourlyWage = 12.0
4
5  if hoursWorked <= 40:
6      moneyEarned += hourlyWage * hoursWorked
7      print ("Money earned (no overtime): " , moneyEarned)
8
9  elif hoursWorked <= 50:
10     moneyEarned += hourlyWage * 40
11     moneyEarned += (hourlyWage *1.5) * (hoursWorked - 40)
12     print ("Money earned (overtime): " , moneyEarned)
13
14 else:
15     moneyEarned += hourlyWage * 40
16     moneyEarned += (hourlyWage *1.75) * (hoursWorked - 40)
17     print ("Money earned (extra overtime): " , moneyEarned)
18
```

Output:

```
kacey@GrilledCheese:~/Documents/CS2110$ python3 CalculatePay.py
How many hours did you work? 36.5
Money earned (no overtime): 438.0
kacey@GrilledCheese:~/Documents/CS2110$ python3 CalculatePay.py
How many hours did you work? 48
Money earned (overtime): 624.0
kacey@GrilledCheese:~/Documents/CS2110$ python3 CalculatePay.py
How many hours did you work? 52
Money earned (extra overtime): 732.0
```

Java Code Example - If Statements

Code:

```
CalculatePay.py ✕ CalculatePay.java ✕
1 class CalculatePay {
2     public static void Calculate(float numHours, float wage){
3         float moneyEarned = 0;
4         if(numHours <= 40){
5             moneyEarned += numHours * wage;
6             System.out.println("Money earned (no overtime): " + moneyEarned);
7         } else if(numHours <= 50){
8             moneyEarned += wage * 40;
9             moneyEarned += (wage * 1.5) * (numHours - 40);
10            System.out.println("Money earned (overtime): " + moneyEarned);
11        } else{
12            moneyEarned += wage * 40;
13            moneyEarned += (wage * 1.75) * (numHours - 40);
14            System.out.println("Money earned (extra overtime): " + moneyEarned);
15        }
16    }
17    public static void main(String[] args) {
18        Calculate(36, 12);
19        Calculate(48, 12);
20        Calculate(52, 12);
21    }
22 }
```

Output:

```
kacey@GrilledCheese:~/Documents/CS2110$ java CalculatePay
Money earned (no overtime): 432.0
Money earned (overtime): 624.0
Money earned (extra overtime): 732.0
```

While loops

Python	Java
<ul style="list-style-type: none">• Use “while” to begin header• Header ends with “:”• Body of while loop must be indented• Use == for “equals” (NOT =) • General Structure:<ul style="list-style-type: none">○ while condition: do stuff in the indented block while the condition is true • More information:<ul style="list-style-type: none">○ http://www.tutorialspoint.com/python/python_while_loop.htm	<ul style="list-style-type: none">• Use “while” to begin header• Use “()” parentheses around the condition of your if statement• Indentation of body is not necessary to execute (but creates clean, easy to read code)<ul style="list-style-type: none">○ Use “{ }” around the body of the if-statement• Use == for “equals” (NOT =) • General Structure:<ul style="list-style-type: none">○ while (condition){ do stuff within the brackets while the condition is true } • More information:<ul style="list-style-type: none">○ http://www.tutorialspoint.com/java/java_while_loop.htm

Python Code Example - While Loops

Code:

```
SandwichEater.py ✕ SandwichEater.java ✕
1 numSandwichesEaten = 0;
2
3 print ("I'm hungry! I'll eat a sandwich...")
4 numSandwichesEaten += 1
5 print ("I've eaten 1 sandwich.")
6
7 while numSandwichesEaten < 5:
8     print ("I'm still hungry! I'll eat another sandwich...")
9     numSandwichesEaten += 1
10    print ("I've eaten ", numSandwichesEaten, " sandwiches.")
11
12 print ("I'm full. I ate ", numSandwichesEaten, " sandwiches.")
13
```


Output:

```
kacey@GrilledCheese:~/Documents/CS2110$ python3 SandwichEater.py
I'm hungry! I'll eat a sandwich...
I've eaten 1 sandwich.
I'm still hungry! I'll eat another sandwich...
I've eaten 2 sandwiches.
I'm still hungry! I'll eat another sandwich...
I've eaten 3 sandwiches.
I'm still hungry! I'll eat another sandwich...
I've eaten 4 sandwiches.
I'm still hungry! I'll eat another sandwich...
I've eaten 5 sandwiches.
I'm full. I ate 5 sandwiches.
```

Java Code Example - While Loops

Code:

```
SandwichEater.py x SandwichEater.java x
1 public class SandwichEater {
2
3     public static void main (String args[]) {
4         int numSandwichesEaten = 0;
5
6         System.out.println("I'm hungry! I'll eat a sandwich...");
7         numSandwichesEaten += 1;
8         System.out.println("I've eaten 1 sandwich.");
9
10        while (numSandwichesEaten < 5){
11            System.out.println("I'm still hungry! I'll eat another sandwich...");
12            numSandwichesEaten += 1;
13            System.out.println("I've eaten " + numSandwichesEaten + " sandwiches.");
14        }
15        System.out.println("I'm full. I ate " + numSandwichesEaten + " sandwiches.");
16    }
17 }
```

Output:

```
kacey@GrilledCheese:~/Documents/CS2110$ java SandwichEater
I'm hungry! I'll eat a sandwich...
I've eaten 1 sandwich.
I'm still hungry! I'll eat another sandwich...
I've eaten 2 sandwiches.
I'm still hungry! I'll eat another sandwich...
I've eaten 3 sandwiches.
I'm still hungry! I'll eat another sandwich...
I've eaten 4 sandwiches.
I'm still hungry! I'll eat another sandwich...
I've eaten 5 sandwiches.
I'm full. I ate 5 sandwiches.
```

For loops

Python	Java
<ul style="list-style-type: none">• High level structure:<ul style="list-style-type: none">◦ <code>for <variable> in <sequence>:</code> <code><statements></code>• Header ends with “:”• Body of if-statement must be indented• <code><sequence></code> must be a collection of type <code><variable></code><ul style="list-style-type: none">◦ Example:<ul style="list-style-type: none">■ <code>for x in range(0,10):</code>	<ul style="list-style-type: none">• High level structure:• <code>for (initialization; condition; update) {</code> <code>statement(s) //block of statements</code> }• Initialization:<ul style="list-style-type: none">◦ Executes once at the beginning of the loop◦ Initializes variable being iterated over• Condition:<ul style="list-style-type: none">◦ Evaluated each iteration of loop until the value returns false• Update:<ul style="list-style-type: none">◦ Executes after each iteration update the counter variable• Java also has an enhanced for-loop which is more similar to the structure of Python's for-loop• High level structure:<ul style="list-style-type: none">◦ <code>for(<data type> <variable name> : <collection>){</code> <code><statements></code> }

Python Code Example1 - For Loop

Code:

```
1 foods = ["spinach","cucumbers","steak","cereal","cheese"]
2 for food in foods:
3     print("I love to eat " + food)
```

Output:

```
cole@cole-laptop:~/Desktop$ python3 for.py
I love to eat spinach
I love to eat cucumbers
I love to eat steak
I love to eat cereal
I love to eat cheese
```

The example above navigates a list of strings using a for loop. To iterate through a list of numbers see below.

Python Code Example2 - For Loop

Code:

```
1 for x in range(0,5):
2     print("My favorite number is " + str(x) + "!!!")
```

Output:

```
cole@cole-laptop:~/Desktop$ python3 for.py
My favorite number is 0!!!
My favorite number is 1!!!
My favorite number is 2!!!
My favorite number is 3!!!
My favorite number is 4!!!
```

Java Code Example1 - For Loop

Code:

```
String[] foods = {"spinach","cucumbers","steak","cereal","cheese"};
for(String food : foods){
    System.out.println("I love to eat " + food);
}
```

Output:

```
cole@cole-laptop:~/Desktop$ java For
I love to eat spinach
I love to eat cucumbers
I love to eat steak
I love to eat cereal
I love to eat cheese
```

Java Code Example2 - For Loop

Code:

```
for(int i = 0; i < 5; i++){
    System.out.println("My favorite number is " + i + "!!!");
}
```

Output:

```
cole@cole-laptop:~/Desktop$ java For
My favorite number is 0!!!
My favorite number is 1!!!
My favorite number is 2!!!
My favorite number is 3!!!
My favorite number is 4!!!
```


1D and 2D Arrays

Python	Java
<ul style="list-style-type: none">● Not type specific<ul style="list-style-type: none">○ Can contain any data type● Dynamic<ul style="list-style-type: none">○ Elements can be added and removed after declaration● 1 Dimensional Array(List):<ul style="list-style-type: none">○ Declare empty List:<ul style="list-style-type: none">■ list = []○ Non empty List:<ul style="list-style-type: none">■ list = [1 , "ten", 7, False]● 2 Dimensional Array(List):<ul style="list-style-type: none">○ A list of lists	<ul style="list-style-type: none">● Type specific<ul style="list-style-type: none">○ Can only contain type specific in declaration● Static<ul style="list-style-type: none">○ Size is set at declaration● 1 Dimensional Array:<ul style="list-style-type: none">○ Follows format:○ <type>[] <name> = new <type>[<size>]○ <type>[] <name> = {elements}● 2 Dimensional Array:<ul style="list-style-type: none">○ Same format as 1D arrays○ Follows format:○ <type>[][] name = new <type>[<size>][<size>]

Python Array Example

Code:

```
1  ### 1 DIMENSIONAL LIST
2
3  #declaration of empty list
4  empty_list = []
5
6  #declaration of non-empty list
7  non_empty_list = [1, "string", False]
8
9  #indexing list - number is set to 1
10 #indices of a list can be updated in the same way
11 number = non_empty_list[0]
12
13 #append to list
14 #empty_list will not contain 1
15 empty_list.append(1)
16
17 #remove from list
18 #"string" will be removed from non_empty_list
19 non_empty_list.remove("string")
20
21 ### 2 DIMENSIONAL LIST
22 produce = ["kale", "spinach", "sprouts"]
23 fruit = ["olives", "tomatoes", "avocado"]
24 #cart is a list of lists, i.e. a 2 dimensional list
25 cart = [produce, fruit]
26
27 #if we indexed cart[0][2] we would get "sprouts"
28 |
```

Java Array Example

Code:

```
1 //1 DIMENSIONAL Array
2
3 //declaration of empty array of ints of size 10
4 int[] emptyArray = new int[10];
5
6 //declaration of non-empty array.
7 //notice in Java arrays the types and size are set at the array declaration
8 String[] nonEmptyArray = {"one","two","three"};
9
10 //indexing array - number is set to "one"
11 //indices of a array can be updated in the same way
12 String number = nonEmptyArray[0];
13
14 //append to array
15 //emptyArray will contain 1 at the 0 indice
16 emptyArray[0] = 1
17 |
18
19 // 2 DIMENSIONAL ARRAY
20 int[][] numbers = new int[5][5];
21
22 //numbers is a 5x5 2D array. Accessing and updated elements
23 //works the same was as the 1D array
```