COMP16412: Side-by-Side Syntax Quick Reference Sheet

Week 1 – Programming Foundations

Getting Started:

```
$javac HelloWorld.java
$java HelloWorld
```

```
$python3 hello_world.py
```

Primitive Data Types:

Declare a variable without assigning a value to it:

```
int age;
```

```
age = None
```

Declaring and Assign in a single statement:

```
char grade = 'A';
final boolean GRADUATED = true;
double pi = 3.14159;
```

```
grade = 'A'
GRADUATED = True
pi = 3.14159;
```

Creating, initializing, and assigning to arrays:

```
int[] powersOfTwo = new int[8]; // length == 8
powersOfTwo[7] = 128;
double[] offices = new double[] {2.24, 2.32};
double[] offices = {2.24, 2.32};
```

```
powers_of_two = list()   # length == 0
powers_of_two[7] = 128   # list length >= 8
offices = list((2.24, 2.32));
offices = [2.24, 2.32]
```

Iteration:

Repeat statement(s) a prescribed number of times:

```
for (int i=0; i<10; i++) {
    System.out.println("i is " + i);
}
```

```
for i in range(10):
    print("i is {i}".format(i=i))
```

Repeat statement(s) a prescribed number of times:

```
while (j <= 12) {
    j += 2;
}
```

```
while (j <= 12):
    j += 2
```

Repeat statement(s) a prescribed number of times:

```
do {
    k /= 5;
} while (k > 100);
```

```
k /= 5    # Python has no do… while equivalent
while (k > 100):
    k /= 5
```

Skip to the next iteration / Break out of the loop :

```
for (int i=0; i<10; i++) {
    if (i % 3 == 0) {
        continue;   // jump to the next iteration
    } else if (i % 5 == 0) {
        break;      // exit the loop completely
    }
}
```

```
for i in range(10):
    if i % 3:
        continue  # jump to the next iteration
    elif i % 5:
        break     # exit the loop completely
```

Operators:

```
x = x + 1; or x += 1; or x++; or ++x;
+  -  /  *  % etc.
==  !=  >  >=  <  <= etc.
&& || ! etc.
```

```
x = x + 1 or x += 1
+  -  /  *  % etc.
==  !=  >  >=  <  <= etc.
and or not etc.
```

Selection:

```
if (a < 10) {
    System.out.println("Small");
} else if (a % 2 == 1) {  // a is odd
    System.out.println("Odd");
} else {
    System.out.println("a is " + a);
}
```

```
if a < 10:
    print("Small")
elif a % 2:  # a is odd
    print("Odd")
else:
    print("a is {0}".format(a))
```

```
switch (day) {
  case 1:
  case 2:
  case 3:
  case 4:
  case 5:
    System.out.println("Weekday");
    break;
  case 6:
  case 7:
    System.out.println("Weekend");
    break;
  default:
    System.out.println("Invalid");
}

String dayName = switch (day) {
    case 1, 2, 3, 4, 5 -> "Weekday";
    case 6, 7 -> "Weekend";
    default -> "Invalid day";
};
```

```
match day:
    case 1 | 2 | 3 | 4 | 5:
        print("Weekday")
    case 6 | 7:
        print("Weekday")
    case _:
        print("Invalid")
```

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