

# CS142: Intro Part 3

# While loops

Work the same as in Python; only difference is syntax.

Python:

```
while condition:  
    statement  
    statement  
    statement
```

Java:

```
while (condition) {  
    statement;  
    statement;  
    statement;  
}
```

# Do-While loops

- These don't exist in Python.
- Work the same as a while loop, except the **first** time through the loop, the condition is not checked.

```
do {  
    statement;  
    statement;  
    statement;  
} while (condition);
```

// notice the semicolon at the end!

# While true loops

- Same as Python
- Useful when the loop exit needs to happen in the middle of the loop body, or in multiple locations in the loop.

```
while (true) {  
    ...statements...;  
  
    if (condition) {  
        break;  
    }  
  
    ...more statements...;  
}
```

# For loops

- Same concept as Python, but syntax is very different.

```
for (initialization; condition; increment) {  
    statement;  
    statement;  
    statement;  
}
```

*What Java does:*

- 1. Runs the initialization.*
- 2. Tests the condition. If condition is true, runs the body. If false, ends the loop.*
- 3. Runs the increment.*
- 4. Goes back to step 2.*

# Arrays

- Mostly the same as Python lists
- Biggest differences compared to Python:
  - Every list can only hold a single data type (e.g., you can have a list of integers, a list of doubles, a list of Strings, etc).
  - Like all variables in Java, you must tell Java when declaring an array variable what data type the array will hold.
  - Arrays cannot grow or shrink in size after they are initialized. An array in Java will always have the same size throughout the program.
    - In Python we could "append" to a list to grow it by one spot; not so in Java!

# Functions!

- Often called "methods" in Java (will explain that term later).
- Defining:

Python:

```
def function_name(param1, param2, ...):  
    statement  
    statement  
    statement
```

Java:

```
public static returnType functionName(  
    type param1, type param2, ...) {  
    statement;  
    statement;  
    statement;  
}
```