++ --

++

++ is a shorthand for adding 1 to a number.

These are the same:

```
x = x + 1;
x++;
```

This is really handy when using long variable names:

```
numberOfPlayers = numberOfPlayers + 1;
numberOfPlayers++;
```

--

-- is a shorthand for subtracting 1 from a number.

These are the same:

```
x = x - 1;
x--;
```

Also handy when using long variable names:

```
zombieCount = zombieCount - 1;
zombieCount--;
```

++

The ++ and -- operators can appear in two forms:

```
Postfix:   x++    "update x after this statement"
Prefix:    ++x    "update x before this statement"
```

```
int x = 5;
System.out.println(++x);  // Would output 6
System.out.println(x);    // Would output 6
```

```
int x = 5;
System.out.println(x++);  // Would output 5
System.out.println(x);    // Would output 6
```

Loops

Loops

Loops are a control flow construct used to repeatedly execute statements in your program.

In general, program execution enters a loop when a condition is true and stays inside the loop as long as the condition is true.

(there are other ways to break out of loops)

while

Look at this code snippet below:

```
int i = 1;

while (i <= 5) {
    System.out.println(i);
    i++;
}
```

What will be the result?

while

Look at this code snippet below:

```
int i = 10;

while (i <= 5) {
    System.out.println(i);
    i++;
}
```

What will be the result?

while

Look at this code snippet below:

```
int i = 1;

while (i <= 5) {
    System.out.println(i);
}
```

What will be the result?

while

Look at this code snippet below:

```
int i = 10;

while (i >= 0) {
    System.out.println(i);
    i = i + 1;
}
```

What will be the result?

while loops for input validation

A while loop can be a useful tool for validating input.

```
String name = "";

while (name.length() == 0) {
    System.out.println("Enter your name: ");
    name = scan.next();
}
```

while loops for menu

A while loop can be a useful tool for building a menu.

```
boolean quit = false;

while (quit == false) {
    System.out.println("Main Menu: ");
    System.out.println("A)dd, D)rop, Q)uit");
    char option = scan.next().charAt(0);
    // Code to handle add/drop here
    if (option == ‘q’) quit = true;
}
```

for

The for loop is designed for iterating a number of times, or iterating through lists. It has 3 parts to it, initialization, condition, and update.

```
for (initialization; condition; update) {
    // Do something here
}
```

for

Look at this code snippet below:

```
int i;

for (i = 0; i < 5; i++) {
    System.out.println(i);
}
```

What will be the result?

for

Look at this code snippet below:

```
int i;

for (i = 5; i > 0; i--) {
    System.out.println(i);
}
```

What will be the result?

for

If you only need the i variable while inside the loop, you can declare it in the initialization.

```
for (int i = 0; i < 5; i++) {
    System.out.println(i);
}
```

What will be the result?

What happens if we try to print i outside of the loop?

Let’s Code

Don’t Forget!

Check the syllabus / schedule for reading assignments and due dates!

Loops and Strings

You can use a combination of a loop, length, and the charAt function to iterate through each character in a string.

Loops and Strings

```
for (int i = 0; i < 6; i++) {
    System.out.println(i);
}
```

Output:

```
0
1
2
3
4
5
```

Loops and Strings

```
String course = "CS 121";

for (int i = 0; i < course.length(); i++)
{
    char c = course.charAt(i);
    System.out.println(c);
}
```

0	1	2	3	4	5
C	S		1	2	1

Loops and Strings

```
String phrase = "163 William St. Room 236";
int totalDigits = 0;

for (int i = 0; i < phrase.length(); i++)
{
    char c = phrase.charAt(i);
    if (Character.isDigit(c)) {
        totalDigits++;
    }
}

System.out.println("Total Digits: " + totalDigits);
```

Nested Loops

Loops in loops!

Nested Loops

```
for (int i = 0; i < 5; i++)
{
    for (int j = 0; j < 5; j++)
    {
        System.out.print("*");
    }

    System.out.println();
}
```

Nested Loops

```
for (int i = 1; i <= 12; i++)
{
    for (int j = 1; j <= 12; j++)
    {
        System.out.printf("%4d", (i * j));
    }

    System.out.println();
}
```

Nested Loops

#mindblown

```
for (int i = 1; i <= 5; i++)
{
    for (int j = 1; j <= i; j++)
    {
        System.out.print("*");
    }

    System.out.println();
}
```

Nested Loops

```
while (done == false) {
    int totalSpaces = 0;
    System.out.println("Enter 3 words: ");
    String phrase = scan.nextLine();

    for (int i = 0; i < phrase.length(); i++)
    {
        if (phrase.charAt(i) == ' ') {
            totalSpaces++;
        }
    }

    if (totalSpaces == 2) done = true;
}
```

Let’s Code

Don’t Forget!

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