

# CSCI 132:

# Basic Data Structures and Algorithms

Lecture 4: Intro to Java (Loops, Arrays)

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# Announcements

- No in-person lecture next Wednesday (2/1)  
→ I will post a lecture recording to the website (asynchronous)
- Lab 2 is posted, due Jan 31<sup>st</sup> @ 11:59 PM

Example: A student is allowed to register for CSCI 476 if they have a GPA greater than 2.0, **and** if they are a Junior **or** Senior

```
public void allowToRegister() {  
  
    if (this.gpa > 2.0) { // check the first condition (Alternatively, we could use an && here)  
  
        if (this.year.equals("Junior") || this.year.equals("Senior")){  
  
            System.out.println("Student is allowed to register for CSCI 476");  
  
        }  
  
    }  
  
}
```

Student.Java

We can check one of two conditions is true using the or operator ( || )

(we do not have the **or** keyword in Java)

```
student1.determineYear();
```

StudentDemo.Java

Example: A student is allowed to register for CSCI 476 if they have a GPA greater than 2.0, **and** if they are a Junior **or** Senior

```
public void allowToRegister() {  
    if (this.gpa > 2.0) { // check the first condition (Alternatively, we could use an && here)  
        if (this.year.equals("Junior") || this.year.equals("Senior")){  
            System.out.println("Student is allowed to register for CSCI 476");  
        }  
    }  
}
```

Student.Java

Why do `this.year.equals("Junior")` and not `this.year == "Junior"`

Checking for string equality in Java is a little bit funky...

Using `==` does **not** check for equivalence of values between two strings...

Example: A student is allowed to register for CSCI 476 if they have a GPA greater than 2.0, **and** if they are a Junior **or** Senior

```
public void allowToRegister() {  
  
    if (this.gpa > 2.0) { // check the first condition (Alternatively, we could use an && here)  
  
        if (this.year.equals("Junior") || this.year.equals("Senior")){  
  
            System.out.println("Student is allowed to register for CSCI 476");  
  
        }  
  
    }  
  
}
```

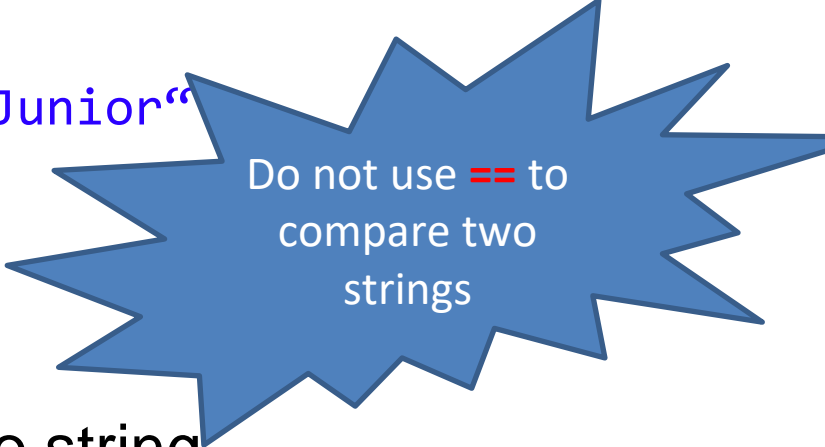
Student.Java

Why do `this.year.equals("Junior")` and not `this.year == "Junior"`?

Checking for string equality in Java is a little bit funky...

Using `==` does **not** check for equivalence of values between two strings...

Instead, we need to use the `.equals()` method between two strings



Do not use `==` to  
compare two  
strings

Arrays are a *collection* of data  
→ Once initialized, are **fixed** in size  
→ Can only hold one data type



Declaring an array and giving it a value

```
int[] test_scores = {99, 81, 65, 46};
```

Declaring an array allocating 5 empty spots (we need to fill them later)

```
String[] names = new String[5];
```

```
System.out.println(test_scores[2]);  
>> 65  
  
System.out.println(test_scores[4]);  
>> ERROR
```

test_scores	0	1	2	3	
	99	81	65	46	
names	0	1	2	3	4
	null	null	null	null	null

**For loops** can be used to iterate across an array.

Two ways:

### *1. Iterate by index*

```
String[] animals = {"Zebra", "Elephant", "Lion", "Penguin"};

for (int i = 0; i < animals.length; i++) {

    System.out.println(animals[i]);

}
```

### *2. Iterate by element*

**For loops** can be used to iterate across an array.

## Two ways:

## 1. Iterate by index

```
String[] animals = {"Zebra", "Elephant", "Lion", "Penguin"};
```

```
for (int i = 0; i < animals.length; i++) {  
    System.out.println(animals[i]);  
}
```

Start at index 0      stop at index 4 (length of array)      Increase the index by 1 each time

Each for loop has:

1. A start
2. A stop
3. A step

## 2. Iterate by element



**For loops** can be used to iterate across an array.

Two ways:

### *1. Iterate by index*

```
String[] animals = {"Zebra", "Elephant", "Lion", "Penguin"};

for (int i = 0; i < animals.length; i++) {

    System.out.println(animals[i]);

}
```

### *2. Iterate by element*

```
for (String i : animals) {
    System.out.println(i);
}
```

Both will give you the  
exact same output...

**While loops** can be used to iterate *if* a condition is true.