CSCI 132:
Basic Data Structures and Algorithms

Intro to Java (Loops, Arrays)

Reese Pearsall & Iliana Castillon

Fall 2024

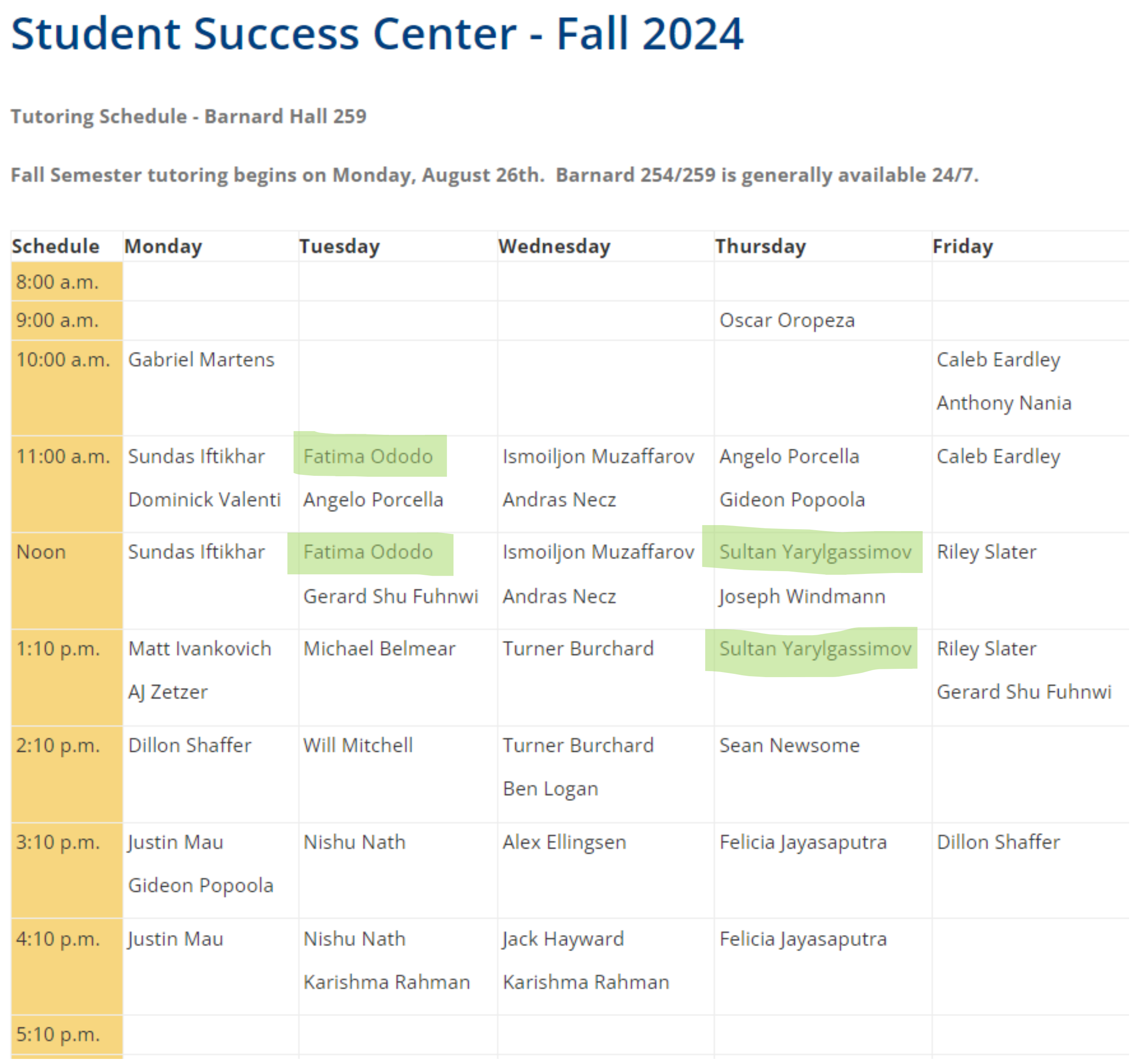
Announcements

- Lab 1 due **tomorrow** at 11:59 PM

→ After today, you will be able to complete it

→ Submit .java files (don't rename them)

I'll be posting this week's materials in a Brightspace announcment



Student Success Center - Fall 2024

Tutoring Schedule - Barnard Hall 259

Fall Semester tutoring begins on Monday, August 26th. Barnard 254/259 is generally available 24/7.

Schedule	Monday	Tuesday	Wednesday	Thursday	Friday
8:00 a.m.					
9:00 a.m.				Oscar Oropeza	
10:00 a.m.	Gabriel Martens				Caleb Eardley
					Anthony Nania
11:00 a.m.	Sundas Iftikhar	Fatima Ododo	Ismoiljon Muzaffarov	Angelo Porcella	Caleb Eardley
	Dominick Valenti	Angelo Porcella	Andras Necz	Gideon Popoola	
Noon	Sundas Iftikhar	Fatima Ododo	Ismoiljon Muzaffarov	Sultan Yarylgassimov	Riley Slater
		Gerard Shu Fuhnwi	Andras Necz	Joseph Windmann	
1:10 p.m.	Matt Ivankovich	Michael Belmear	Turner Burchard	Sultan Yarylgassimov	Riley Slater
	AJ Zetzer				Gerard Shu Fuhnwi
2:10 p.m.	Dillon Shaffer	Will Mitchell	Turner Burchard	Sean Newsome	
			Ben Logan		
3:10 p.m.	Justin Mau	Nishu Nath	Alex Ellingsen	Felicia Jayasaputra	Dillon Shaffer
	Gideon Popoola				
4:10 p.m.	Justin Mau	Nishu Nath	Jack Hayward	Felicia Jayasaputra	
		Karishma Rahman	Karishma Rahman		
5:10 p.m.					

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

```java
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)

```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

```java
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“`

Do not use **==** to compare two strings

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 string

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

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

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

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];
```

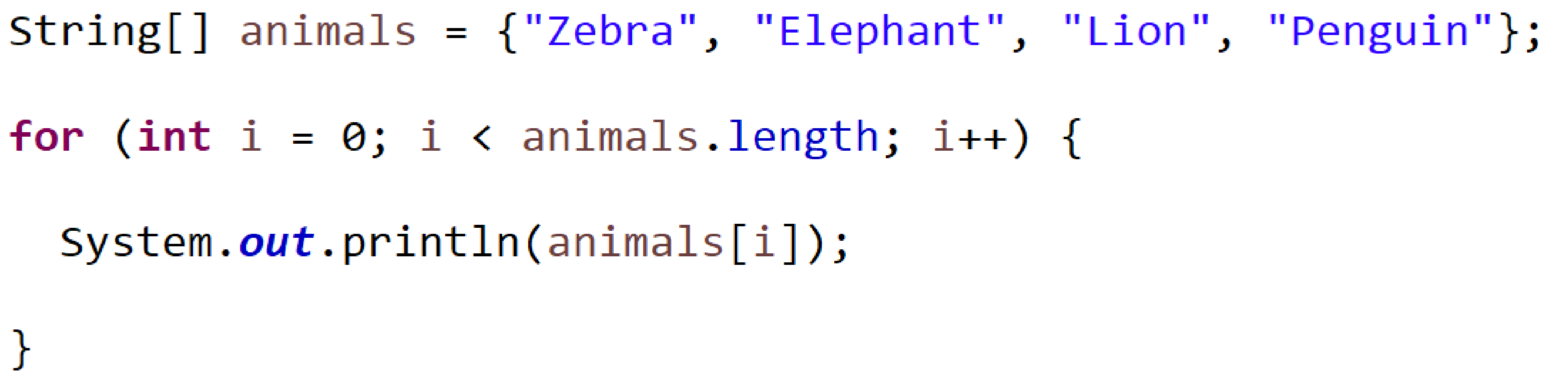
	0	1	2	3
test_scores	**99**	**81**	**65**	**46**

	0	1	2	3	4
names	**null**	**null**	**null**	**null**	**null**

For loops can be used to iterate across an array.

Two ways:

1. Iterate by index



```java
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

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

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

Start at index 0

stop at index 4
(length of array)

Increase the index by 1 each time

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

}
```

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…