

Lesson 1: Project Planning

Natural Language Processing

Term	Definition	Example / Picture / Code
natural language processing (NLP)		

What are some other examples of where you have seen or experienced NLP?

What are some examples of where you think NLP could be useful?

Documentation

Based on our experiences with writing and reading each other's code, what are some best practices we should follow when writing and documenting code?

Term	Definition	Example / Picture / Code
documentation	Written descriptions of the _____ and the _____ of _____.	
Javadocs	A documentation tool for Java that is written inside _____ and formatted using _____ tags.	
HTML		<pre><h1> AddNumbers </h1> <p> Adds two integers </p></pre>

Javadocs Tags

@param

@return

Reflection

Question of the Day: How can I identify the requirements and things I need to know to complete a project?

How might you choose to use natural language processing as a tool for self expression?

Lesson 2: Substrings

Smart Assistants

When we ask Siri questions, it performs a specific task or gives a response based on our question or statement. But how does it know what task to perform or how to respond?

The substring() Method

```
String substring(int beginIndex)
```

```
String substring(int beginIndex, int endIndex)
```

String objects are _____, meaning the contents of the

String _____ after it is created.

String methods _____ the original **String** object.

Reflection

Question of the Day: How can I analyze parts of a **String** object?

On a scale of 0 to 5, how confident are you in your ability to do the following:

- Use the `substring()` method in the `String` class to retrieve a substring of a `String` object
- Use the `indexOf()` and `substring()` methods in the `String` class to find and replace specific characters

(circle one)

1

2

3

4

5

What needs to happen to increase that number?

Lesson 3: Integer and Double Objects

Primitive and Reference Types

What are some differences between primitive and reference types?

Video Notes: Wrapper Classes - Part 1

Three Things You Learned

1

2

3

Two Interesting Ideas

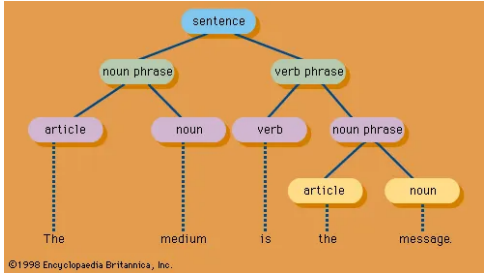
1

2

One Question or Wonder

Integer and Double Classes

Integer	Double

Term	Definition	Example / Picture / Code
parsing		 ©1998 Encyclopaedia Britannica, Inc.

Integer Ranges



Consider each of the following statements and determine if they are true or false. If it is false, explain why. If you are unsure, explain why.

1. _____ Adding 1 to `MAX_VALUE` will not change the value, because the value has already met its maximum limit and cannot increase.

Reasoning:

2. _____ An underflow error occurs when an operation makes an integer value *less* than its minimum.

Reasoning:

Term	Definition	Example / Picture / Code
autoboxing	Automatically converts a _____ to a _____ of the corresponding wrapper class	<pre>int x = 64; Integer y = x;</pre>
unboxing	Automatically converts an _____ of a wrapper class into its corresponding _____ _____	<pre>Integer x = new Integer(64); int convertedInt = x;</pre>

Reflection

Question of the Day: Why would I want to represent primitive values as objects?

What is the relationship between wrapper classes, integers, double values, and overflow/underflow?

Lesson 4: ArrayLists

Storing User Input in a List

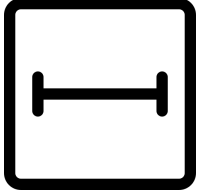
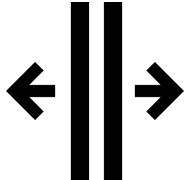
The Joyful Pastries Food Truck owner wants cashiers to enter customer orders into a list as they are received so the baker can complete the orders from the list.

What if we don't know how many orders the owner needs to enter into the program? What would we need to change in our solution?

Video Notes: The ArrayList Class

Follow along with the video and use the table below to create an **ArrayList**. Annotate it as you watch.

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Term	Definition	Example / Picture / Code
static data structure		
dynamic data structure		
mutable		

ArrayList
Parameters:
Methods:

Reflection

Question of the Day: Why would I use an **ArrayList** instead of an array?

What are two big ideas about **ArrayLists** that you think will appear again in our lesson next class?

Lesson 5: Manipulating Elements

Accessing Elements

How do we get an individual element from an array?

How can we do this with an **ArrayList** based on what we know about its structure?

Video Notes: Working with ArrayList Data

True or False? Consider each of the following statements and determine if they are true or false. If it is false, explain why. If you are unsure, explain why.

1. _____ Dot notation and a method are used to access values in an ArrayList.

Reasoning:

2. _____ `add()` is a static method.

Reasoning:

Reflection

Question of the Day: How am I able to work with the data stored in an `ArrayList`?

Which parts or terms from today's class were new to you? Which parts do you recognize?

Lesson 6: Comparing Strings

Term	Definition	Example / Picture / Code
lexicographical order		A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

```
1 String firstWord = "Hello";  
2 String secondWord = "HELLO";  
3 String thirdWord = "Java";  
4 System.out.println(firstWord.compareTo(thirdWord));  
5 System.out.println(firstWord.compareTo(secondWord));  
6 System.out.println(thirdWord.compareTo(firstWord));
```

```
int compareTo(String string2)
```

Reflection

Question of the Day: How can I determine if a list of `String` objects are in alphabetical order?

How have your software engineering skills improved in this unit?

Lesson 7: Lists of Objects

When you hear the phrase "generic type", what do you think that means? What do you think of?

Term	Definition	Example / Picture / Code
generic type	Allows a _____, or _____, to be used as the _____ to an <code>ArrayList</code> and is indicated by _____	

Reflection

Question of the Day: Why would I use generic types?

What is one goal you have for yourself in the next class?

Lesson 8: Removing Elements

The Social Media Dilemma

You are writing an algorithm for your favorite social media app. This algorithm uses an array to store the names of every user someone is following. We know that people sometimes “break up” with friends for whatever reason. Therefore, the user needs the ability to unfollow or remove a friend from their list.

How is the `remove()` method different from how we would remove items from an array?

Similar	Different

Removing with an Enhanced for Loop

Enhanced for Loop: Arrays

```
for(int price : prices) {
    System.out.println(price);
}
```

Enhanced for Loop: ArrayList

```
for(Integer price : prices) {
    System.out.println(price);
}
```

WORD BANK

ConcurrentModificationException enhanced loop ArrayList array

Using an _____ while adding or removing elements from an ArrayList may cause a _____.

_____s are immutable, which means the size cannot change.

Using remove() with an _____ completely removes the element, shifting the rest of the items.

Reflection

Question of the Day: How is removing data from an `ArrayList` different from removing data from an array?

How does the idea of removing elements connect with what you already know?

Lesson 9: ArrayList and String Algorithms

ArrayLists Review Concept Map

How do ArrayLists make it easier to work with data in our programs?

Create a concept map that illustrates the concepts and their relationships in response to this prompt.

Term	Definition	Example / Picture / Code
text segmentation		

What steps would our programs need to take to obtain a word from a sentence?

What about a sentence from a paragraph?

Term	Definition	Example / Picture / Code
stop word		to from of with at the in for on
stop word removal	Removing commonly used words from a list before or after processing text	

Reflection

Question of the Day: How can I use what I know about object-oriented programming and **ArrayLists** to plan and implement algorithms?

How do you see **String** manipulation being used in software or apps that you use?