LEC 02

CSE 122

File I/O – Token and line-based processing

Questions during Class?

Raise hand or send here

sli.do #cse122



BEFORE WE START

Talk to your neighbors:

Slido Poll: Are you a cat person or dog person?

Music: 122 25wi Lecture Tunes



Elba Garza Instructor:

TAs:

Anya **Ashley** Cady Caleb Carson Chaafen Colin Connor Dalton

Daniel Rvan Ken Kuhu Diya Elizabeth Kyle Hannah Leo Harshitha Logan Ivory Maggie Mahima Izak

Jack Marcus Jacob Minh

Nicole Nicole Niyati Sai Steven Yang Zach

Lecture Outline

Announcements/Reminders



- Review Java
- Scanners for User Input and Files
 - Token-based & Line-based processing
- File I/O Examples

Announcements

- The IPL is open!
 - MGH 334, Schedule is on the course website; staffed by our awesome TAs!
 - Open 12:30 to 9:30PM most days, but check the schedule...
- Creative Project 0 due Thursday, January 16th at 11:59pm
 - Make sure to complete the "Final Submission" slide and **submit!**
 - Submit as many times as you'd like—we will only grade the latest submission made before the deadline
- Just joined CSE 122? That's okay; look at Ed & course website and catch up!
 - Freaking out that C0 is due tomorrow? It's ok! <u>Resubmission cycles</u> allow you to submit it later.
- Go to your designated quiz sections!
- Quiz dates:

Quiz 0: January 28thth **Quiz 1**: February 18th **Quiz 2**: March 4th

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Reminders: Review Java Syntax

Java Tutorial reviews all the relevant programming features you should familiar with (even if you don't know them in Java).

- Printing and comments
- Variables, types, expressions
- Conditionals (if/else if/else)
- Loops (for and while)
- Strings
- Methods
- Arrays & 2D arrays

There were some technical difficulties with the recordings of the Java Review Sessions from Monday (January 13th), but we uploaded a couple from 24Au 2

Lecture Outline

- Announcements/Reminders
- Review Java
- Scanner for User Input and Files
 - Token-based & Line-based Processing



• File I/O Examples

(Review) Scanner for User input

Scanner is defined in the java.util package

import java.util.*;

Scanner console = new Scanner(System.in);

Scanner Methods	Description
nextInt()	Reads the next token from the user as an int and returns it
<pre>nextDouble()</pre>	Reads the next token from the user as a double and returns it
next()	Reads the next token from the user as a String and returns it
nextLine()	Reads an entire line from the user as a String and returns it
hasNextInt()	Returns true if the next token can be read as an int, false otherwise
hasNextDouble()	Returns true if the next token can be read as a double, false otherwise
hasNext()	Returns true if there is another token of input to be read in, false otherwise
hasNextLine()	Returns true if there is another line of input to be read in, false otherwise

The quick,
Jumped
Lazy dog.

brown fox over the

Token are units of input (as defined by the Scanner) that are separated by *whitespace* (spaces, tabs, new lines)

The quick, Jumped Lazy dog.

brown fox over the

The

The quick, brown fox Jumped Lazy dog.

over the

quick,

The quick,
Jumped
Lazy dog.

brown fox over the

brown

The quick,
Jumped
Lazy dog.

brown fox over the

fox

Ine quick,
Jumped
Lazy dog.

brown fox over the

```
The quick, brown fox Jumped over the Lazy dog.
```

The quick, brown fox



Practice: Think



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How many tokens are in the following line?

"Hello world!" my-name is Elba

A) Four

B) Five

C) Six

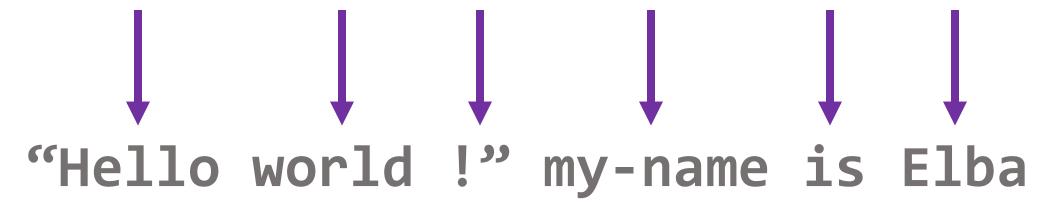
D) Seven





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How many tokens are in the following line?



A) Four

B) Five

C) Six

D) Seven

(PCM) Scanner for File I/O

Scanner is defined in the java.util package import java.util.*;

File is defined in the java.io package
import java.io.*;

```
File file = new File("Example.txt");
Scanner fileScan = new Scanner(file);
```

Scanner Methods	Description
nextInt()	Reads the next token from the user as an int and returns it
<pre>nextDouble()</pre>	Reads the next token from the user as a double and returns it
next()	Reads the next token from the user as a String and returns it
<pre>nextLine()</pre>	Reads an entire line from the user as a String and returns it
hasNextInt()	Returns true if the next token can be read as an int, false otherwise
hasNextDouble()	Returns true if the next token can be read as a double, false otherwise
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(PCM) Checked Exceptions

If you try to compile a program working with file scanners, you may encounter this error message:

error: unreported exception FileNotFoundException; must be caught or declared to be thrown

To resolve this, you need to be throws FileNotFoundException at the end of the header of any method containing file Scanner creation code, or any method that calls that method!

This is like signing a waiver and telling Java – "Hey, I hereby promise to not get mad at you when you bug out and crash my program if I give you a file that doesn't actually exist."

(PCM) Typical Line-Processing Pattern

```
while (scan.hasNextLine()) {
    String nextLine = scan.nextLine();
    // do something with nextLine
}
```

(PCM) Typical Token-Processing Pattern

```
while (scan.hasNext__()) {
          nextToken = scan.next__();
          // do something with nextToken
}
```



Practice: Think



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What is the output of this Java program?

Example.txt:

One Two Three

- A) One, Two, Three,
- **B)** One, **C)** One Two, Two, Three,
- **D)** One Two, Three,
- E) Error / Exception





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What is the output of this Java program?

Example.txt:

One Two Three

- A) One, Two, Three,
- **B)** One, **C)** One Two, Two, Three,
- **D)** One Two, Three,
- **E)** Error / Exception

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(Friday's PCM) Typical Hybrid Pattern

```
while (fileScan.hasNextLine()) {
    String line = fileScan.nextLine();
    Scanner lineScan = new Scanner(line);
    while (lineScan.hasNext ()) {
           nextToken = lineScan.next ();
        // do something with nextToken
```