File Input/Output

Scanner Class

Part of standard Java class library

Reading and writing input values

Source can be keyboard or data file

Scanner Class

Basics

Create a Scanner object according to API
```
  public Scanner (someSource)…

   Scanner scan = new Scanner(System.in);
```
Common Scanner public methods:
```
    public String next ( );
    public String nextLine ( );
    public boolean hasNext ( );
    public float nextFloat ( );
    public int nextInt ( );
```

Scanner Class

Basic Example

Create a Scanner to read integers from keyboard
```
    Scanner sc = new Scanner(System.in);
    int i = sc.nextInt();
```
Read all the integers…
```
 Scanner readInt = new Scanner(System.in);
 while (readInt.hasNextInt( ))
    int aVal = readInt.nextInt( );
```

Scanner Class

Basic Example

"next" reads the next "token" value

  Delimiter

  Whitespace is normal

  Can change this if desired

So enter values with spaces, tabs, or newlines

Scanner Class

Which loop is appropriate?

Use these to read and average a file of integers
```
    public boolean hasNext ( );
    public int nextInt ( );
```

File access "patterns"

Solution (partial) to a known/recurring problem

Read values …

while (not at end)
read and process next value

Scanner Class

Read all the integers…
```
Scanner readInt = new Scanner(System.in);
while (readInt.hasNextInt( )) {
    int aVal = readInt.nextInt( );
    …do something with aVal…
}
```

Scanner Class

Can also read from a file

Requires using the File class (also part of Java library)
```
public Scanner (File f); //constructor
```

- `File myFile = new File ("nameOfFile");`
- `Scanner s =  new Scanner (myFile);`

Design

The "on track to graduate" file contains 2000 sorted student ID's (which are stored as integers) of students who are currently up-to-date with CLPs

Determine whether You are part of that file
…allow the user to enter their student ID

Design

Pseudo code

currentID is initially any negative value *(i.e. invalid)*

Get *searchID* value from user's keyboard

while (not found && still might find it)
    currentID = read next ID

Design

Closer to Java code
```
int currentID = -1;
Scanner keyBoard = new Scanner (System.in);
int searchID = keyBoard.nextInt( );

Scanner file = new Scanner (new File ("clp.txt"));

while (currentID < searchID && file.hasNext( ))
{
    currentID = file.nextInt( );
}
```

Final Java

Import various libraries

File might throw exception (checked)

Add "prompt" for user input

Add output …did we find it?

Practice

Quiz on Friday

Do Self-Review questions 2.36 & 2.37

Programming project PP 2.8 (page 109)

Main method - reads values and prints results

Your method does the calculations