CS 2334: File I/O

Streams

- A sequence of bytes
  - Bytes (or sets of bytes) can represent characters
- This sequence has a beginning and an end

Streams

Common operations:

- Read: give me the next byte (or bytes) from the front of the sequence
  - These bytes are “consumed” and won’t be read again
- Write: append a set of bytes to the end of the sequence

(these are the basics, but there are many variations on this concept)

Streams You Know

- System.out: bytes written to this stream by your program appear in your console
- System.in: things typed in your console are inserted into this stream & can then be read by your program

Streams Can Connect to Many Different Things

- Files
- Other devices (e.g., audio, video)
- Other programs located on other computers

Using an Input Stream

From Lab 1 (connecting to System.in):

```
BufferedReader br = new BufferedReader(new InputStreamReader(System.in));
String strg = br.readLine();  // Receive an entire line from the console
```

Using an Input File

```
BufferedReader br = new BufferedReader(new InputStreamReader(System.in));
String strg = br.readLine();  // Receive an entire line from the console

-------------------------------------------------------------------------

BufferedReader br = new BufferedReader(new FileReader("Afile.txt"));
String strg = br.readLine();  // Receive an entire line from the file
```

Using an Input File

```
BufferedReader br = new BufferedReader(new FileReader("Afile.txt"));
String strg = br.readLine();  // Receive an entire line from the console
```

- After opening, the interaction with the stream is identical because you are still using a BufferedReader!

Close the File When Done

```
BufferedReader br = new BufferedReader(new FileReader("Afile.txt"));
String strg = br.readLine();  // Receive an entire line from the console

        :
        :

br.close();          // Close the file
```

FileReader vs FileInputStream

- FileInputStream: generic binary data
- FileReader: use if you expect characters only
  - Deals properly with multi-byte encodings of characters (Unicode)