# Reading/Writing Files, Webpages

CS2110, Recitation 9

## Reading files/ webpages

I/O classes are in package java.io.
To import the classes so you can use them, use

**import** java.io.*;

## Class File

An object of class File contains the path name to a file or directory. Class File has lots of methods, e.g.

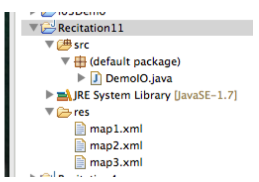
f.exists()    f.canRead()    f.canWrite()
f.delete()    f.createNewFile()
f.length()    … (lots more) …

File f= **new** File("res/map1.xml");

File path is relative to the package in which the class resides.

Can also use an absolute path. To find out what absolute path's look like on your computer, use

f.getAbsolutePath();

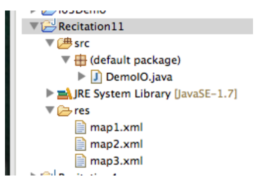


## Class File

f.isdirectory()    f.listFiles()    f.list()    f.mkdir()

Suppose f contains a File that describes a directory.
Store in b a File[] that contains a File element for each file or directory in directory given by f

File[] b= f.listFiles()



f.list() returns an array of file and directory names as Strings, instead of as File objects

f.Mkdir() will create the directory if it does not exist.

## Input Streams

**Stream**: a sequence of data values that is processed —either read or written— from beginning to end. We are dealing with input streams.

Read input stream for a file is by creating an instance of class FileReader:

FileReader fr= **new** FileReader(f);

f can be a File or a String that gives the file name

fr.read()    // get next char of file

Too low-level! Don't want to do char by char.

## Reading a line at a time

Class BufferedReader, given a FileReader object, provides a method for reading one line at a time.

FileReader fr= **new** FileReader(*f*);
BufferedReader br= **new** BufferedReader(fr);

Then:
String s= br.readLine(); // Store next line of file in s

When finished with reading a file, it is best to close it!

br.close();

## Example: counting lines in a file

```
/** Return number of lines in f.
    Throw IO Exception if problems encountered when reading */
public static int getSize(Filef) throws IOException {
    FileReader fr= new FileReader(f);
    BufferedReader br= new BufferedReader(fr);
    int n= 0;  // number of lines read so far
    String line= br.readLine();
    while (line != null) {
        n= n+1;
        line= br.readLine();
    }
    br.close();
    return n;
}
```

Don't forget!

(write as while loop)

Always use this pattern to read a file!

```
line= first line;
while (line != null) {
    Process line;
    line= next line;
}
```

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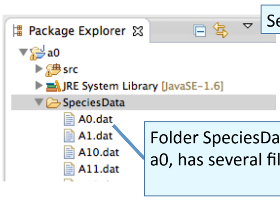
## FileReader(String)

When calling FileReader with a String argument s, s can be a name relative to the Eclipse project you are running.

When running a procedure main in Project a0, because folder SpeciesData is in a0, to read file A0.dat, we can use

FileReader fr= **new** FileReader("SpeciesData/A0.dat");

Separate names in path with /.



Folder SpeciesData, in project a0, has several files in it

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## Given method main an argument

**public static void** main(String[] args) { … }

Parameter: String array

In Eclipse, when you do menu item

Run -> Run   or   Run -> Debug

Eclipse calls method main. Default is main(null);

To tell Eclipse what array of Strings to give as the argument, Use menu item

Run -> Run Configurations…

or

Run -> Debug Configuration…

(see next slide)

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## Window Run Configuations

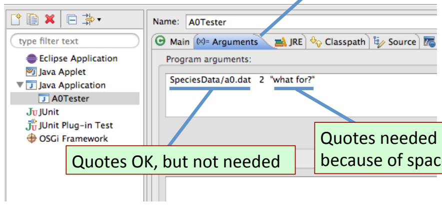
This Arguments pane of Run Configurations window gives argument array of size 3:

args[0]: "SpeciesData/a0.dat"

args[1]: "2"

args[2]: "what for?"

Click Arguments pane



Name: A0Tester

Program arguments:

SpeciesData/a0.dat 2 "what for?"

Quotes OK, but not needed

Quotes needed because of space char

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## Class URL in package java.net

URL url= **new** URL("http://www. … …. /links.html);

A URL (Universal Resource Locator) describes a resource on the web, like a web page, a jpg file, a gif file

The "protocol" can be:

http   (HyperText Transfer Protocol)
https
ftp   (File Transfer Protocol)

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## Reading from an html web page

Given is URL url= **new** URL("http://www. … …. /links.html);

To read lines from that webpage, do this:

1. Create an InputStreamReader:
   InputStreamReader isr=
   **new** InputStreamReader(url.openStream());

Have to open the stream

2. Create a Buffered Reader:
   BufferedReader br=  **new** BufferedReader(isr);

3. Read lines, as before, using br.readLine()

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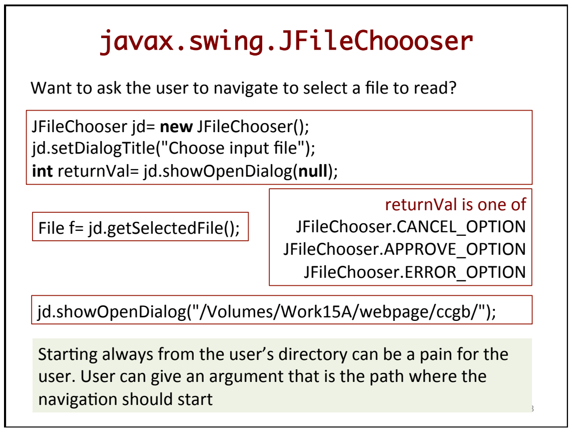

## javax.swing.JFileChoooser

Want to ask the user to navigate to select a file to read?

```
JFileChooser jd= new JFileChooser();
jd.setDialogTitle("Choose input file");
int returnVal= jd.showOpenDialog(null);
```

```
File f= jd.getSelectedFile();
```

returnVal is one of
JFileChooser.CANCEL_OPTION
JFileChooser.APPROVE_OPTION
JFileChooser.ERROR_OPTION

```
jd.showOpenDialog("/Volumes/Work15A/webpage/ccgb/");
```

Starting always from the user's directory can be a pain for the user. User can give an argument that is the path where the navigation should start

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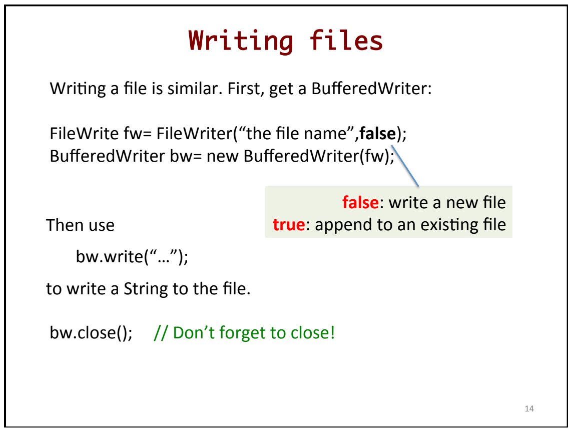

## Writing files

Writing a file is similar. First, get a BufferedWriter:

```
FileWrite fw= FileWriter(“the file name”,false);
BufferedWriter bw= new BufferedWriter(fw);
```

**false**: write a new file
**true**: append to an existing file

Then use

```
bw.write(“…”);
```

to write a String to the file.

```
bw.close();    // Don’t forget to close!
```

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