# Reading/Writing Files, Webpages

CS2110, Week 11 Recitation



## Reading files/ webpages

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

```
import java.io.*;
```

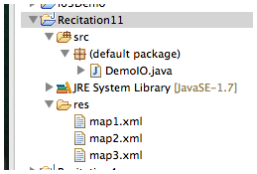


## Class File

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();
```

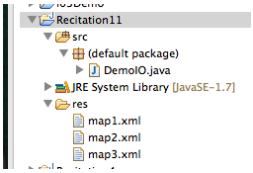


## Class File

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 or for loop)

Always use this structure!

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

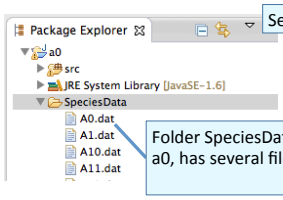
## FileReader(String)

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

## 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)

## Window Run Configuations

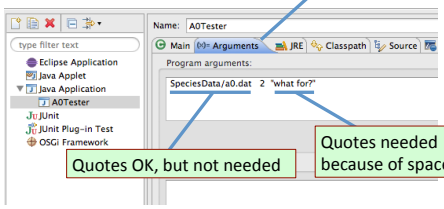
This Arguments pane of Run Configurations window gives argument array of size 3:

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

args[1]: "2"

args[2]: "what for?"

Click Arguments pane




Quotes OK, but not needed

Quotes needed because of space char

## 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)

## 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()