

Module 1 Day 18

File Output

Module 1 Unit 18 File Output

Can you ... ?

- ... describe the concept of exception handling
- ... implement a try/catch structure in a program
- ... use and discuss the `System.IO` namespace (C#) / `java.io` library File and Directory classes
- ... explain what a character stream is
- ... use a try-with-resources block
- ... handle File I/O exceptions and how to recover from them
- ... talk about ways that File I/O might be used on the job

Java Output

Java has the ability to communicate data back to the user. Consider some of these methods:

- Using `System.out.println()` that sends a message to the console.
- Send a HTML view back to the user (Module 3).
- Write data to a database (Module 2).
- Transmit data to an API (Module 4).

For today, we will focus on something simpler, writing data back to a text file.

File class: create a directory.

```
public static void main(String[] args) {  
    File newDirectory = new File("myDirectory");  
  
    if (newDirectory.exists()) {  
        System.out.println("Sorry, " + newDirectory.getAbsolutePath() + " already exists.");  
    }  
    else {  
        newDirectory.mkdir();  
    }  
}
```

We won't create a new directory if it exists.


Otherwise, the .mkdir method will create a new directory.


File class: create a directory.


Just like with reading from files, writing is done with respect to the project root.


Name


 .settings


 myDirectory

 src

 target

 .classpath

 .project

 pom

Note that the folder specified in the example is now present at the root.

File class: create a file.

```
public static void main(String[] args) throws IOException {  
    File newFile = new File("myDataFile.txt");  
    newFile.createNewFile();  
}
```

File class: create a file within a directory.

```
public static void main(String[] args) throws IOException {  
    File newFile = new File("myDirectory","myDataFile.txt");  
    newFile.createNewFile();  
}
```

Writing to a File

Just like with reading data from a file, writing to a file involves bringing in an object of another class. In this case, we will need an instance of the `PrintWriter` class.

When more than one class is required to solve a problem, we typically refer to these classes as **collaborators**. In this case, the `File`, and `Printwriter` classes are collaborators.

Writing a File Example

```
public static void main(String[] args) throws IOException {  
    File newFile = new File("myDataFile.txt");  
    String message = "Appreciate\nElevate\nParticipate";  
  
    PrintWriter writer = new PrintWriter(newFile.getAbsolutePath());  
    writer.print(message);  
    writer.flush();  
    writer.close();  
}
```

Create a new file object.

Create a PrintWriter object.

print the message to the buffer.

flush the buffer's content to the file.

The expected result:

- There will be a new text file in the project root.
- The file will be called myDataFile.txt
- The file will contain each of the three words in its own line.

What is a buffer?

A buffer is like a bucket where the text is initially written to. It is only after we invoke the **.flush()** method that the bucket's contents are transferred to the file.

The flush (and the .close()) can be performed automatically if the the following pattern is used:

```
public static void main(String[] args) throws IOException {  
    File newFile = new File("myDataFile.txt");  
    String message = "Appreciate\nElevate\nParticipate";  
  
    try(PrintWriter writer = new PrintWriter(newFile.getAbsolutePath())) {  
        writer.print(message);  
    }  
}
```

Appending to a File

The previous example regenerates the file's contents from scratch every time it's run. Sometimes, a file might need to be appended to, preserving the existing data content. The `PrintWriter` supports two constructors:

- **`PrintWriter(file)`**, where `file` is a file object.
- **`PrintWriter(outputStream, mode)`**
 - `outputStream` will be an instance of the `OutputStream` class.
 - `Mode` is a boolean indicating if you want to instantiate the object in append mode (`true` = yes).

Appending a File Example

```
public static void main(String[] args) throws IOException {  
    File newFile = new File("myDataFile.txt");  
    String message = "Appreciate\nElevate\nParticipate";  
  
    PrintWriter writer = null;  
  
    // Instantiate the writer object with append functionality.  
    if (newFile.exists()) {  
        writer = new PrintWriter(new FileOutputStream(newFile.getAbsoluteFile(), true));  
    }  
  
    // Instantiate the writer object without append functionality.  
    else {  
        writer = new PrintWriter(newFile.getAbsoluteFile());  
    }  
  
    writer.append(message);  
    writer.flush();  
    writer.close();  
  
}
```

The expected result is that *myDataFile.txt* will be continuously appended with the message text each time it runs.