

Reading Files

Files are read into a java program through connections known as streams. Streams are types of classes. When we want to make a connection we instantiate an object of a particular stream class.

There are many different kinds of streams that each have different purposes.

Most programs combine a least 2(and often more) streams together for specific purposes.

The first stream that we will look at is called FileReader.
As it's name implies it connects to a file.

For instance, if we wanted to make a connection between our java program and a text file called "textfile.txt" we would instantiate the FileReader class like this:

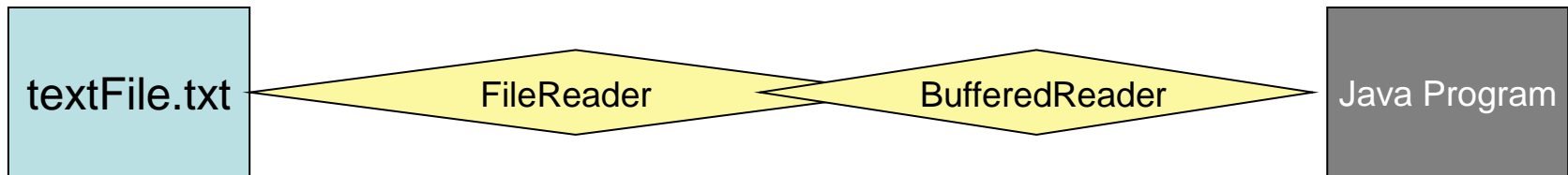
```
FileReader fr = new FileReader("textfile.txt");
```

FileReader and BufferedReader Classes

By itself the file `FileReader` class has limited functionality. It is very good at connecting java programs to an external file but not much else.

The `BufferedReader` class has its own speciality which is reading data from a stream, but by itself it can not connect to an external file.

What it does instead of reading from the file directly is that it reads from the stream created by the `FileReader` class.



```
FileReader fr = new FileReader("textfile.txt");
```

```
BufferedReader br = new BufferedReader(fr);
```

A red arrow points from the `fr` variable in the first line to the `fr` parameter in the second line.

BufferedReader Files

The BufferedReader class has a number of useful methods that we can use to read information from the FileReader stream.

The ones that we will use most often is the readLine() method which as the name implies, reads a single line from the stream.

br .

◆ notify ()	void
◆ notifyAll ()	void
◆ read (char[], int, int)	int
◆ read (char[])	int
◆ read (CharBuffer)	int
◆ read ()	int
◆ readLine ()	String
◆ ready ()	boolean
◆ reset ()	void
◆ skip (long)	long

FileReader

```
FileRead.java *
1  import java.io.*;
2
3  class FileRead
4  {
5      public static void main(String args[]) throws IOException
6      {
7
8          // Open the file
9          FileReader fr = new FileReader("textfile.txt");
10
11
12         BufferedReader br = new BufferedReader(fr);
13
14         String strLine;
15         //Read File Line By Line
16
17         while ((strLine = br.readLine()) != null)
18         {
19             // Print the content on the console
20             System.out.println (strLine);
21         }
22         //Close the input stream
23         fr.close();
24     }
25 }
```

Creates connection object between java and the text file.

The BufferedReader object br reads lines of text from the FileReader stream object fr. Since fr is connected to the text file, the effect is that a line of text is read from the file to the java program.

As long as there are lines left is restated in Java as while line being read is not equal to null.

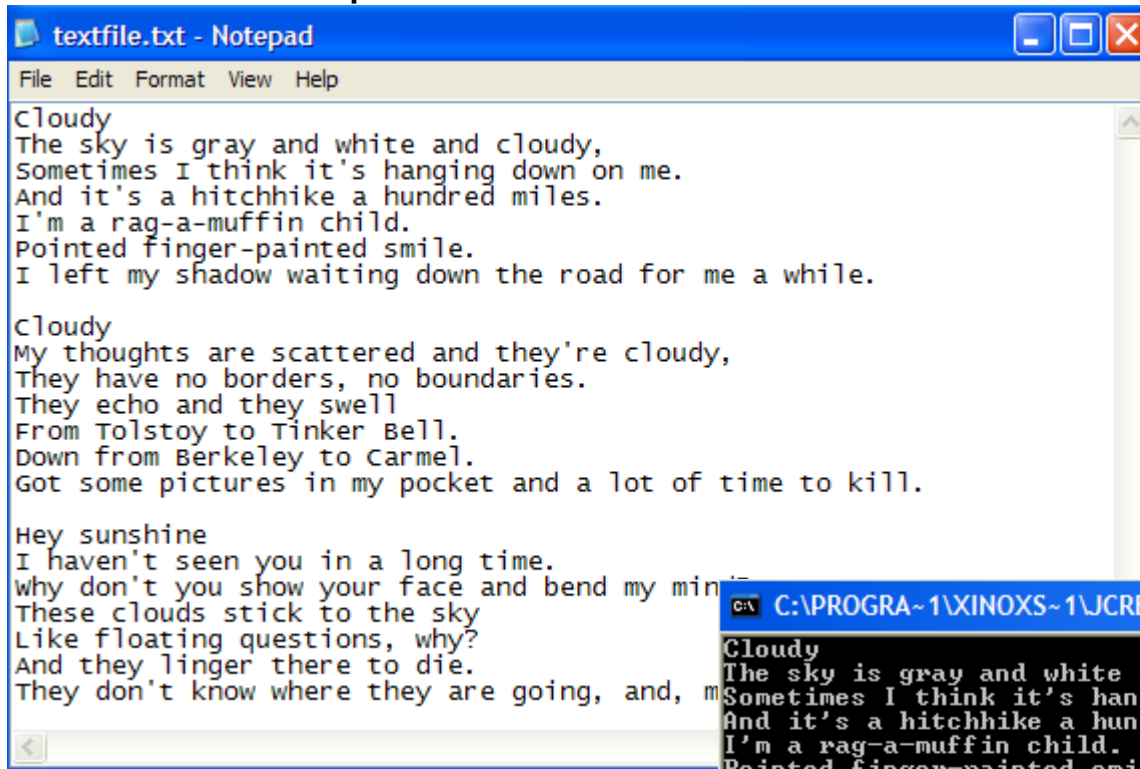
The while statement below is simply saying that a line of text from the stream will be assigned to the String variable strLine as long as there are lines to be read.

Within the while loop, the value of strLine is output. Note that the value of strLine changes as each line of read from the text file.

```
String strLine;
//Read File Line By Line

while ((strLine = br.readLine()) != null)
{
    // Print the content on the console
    System.out.println (strLine);
}
```

The Input File...

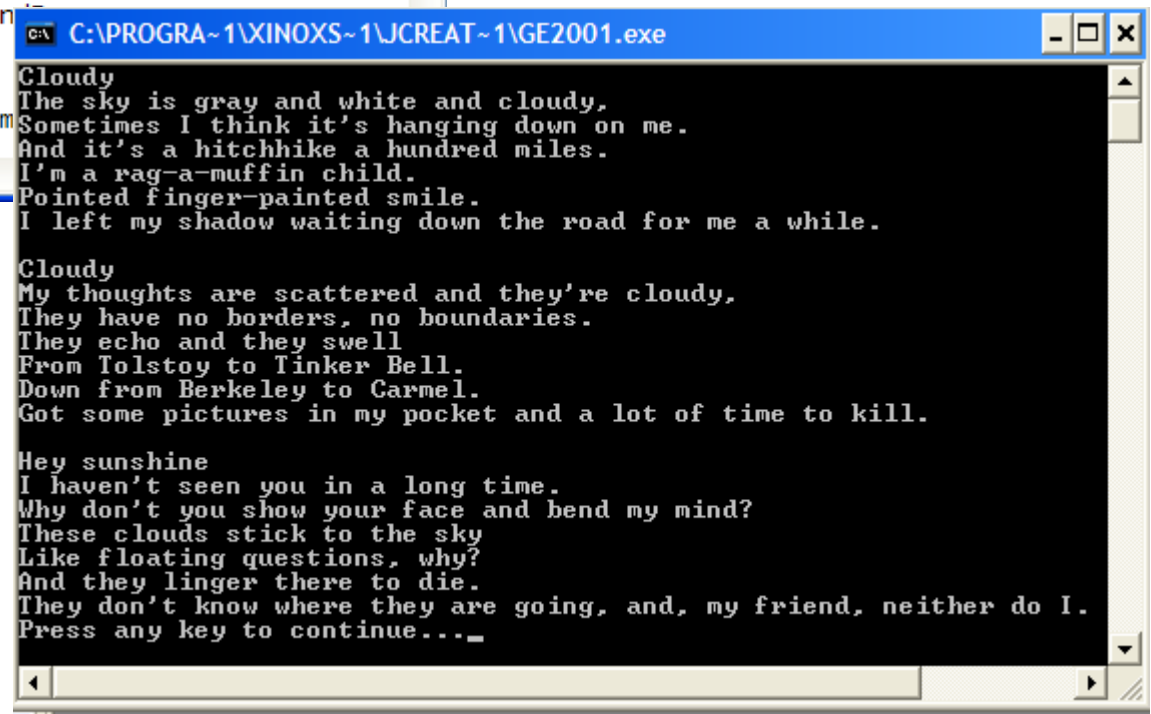


```
File Edit Format View Help
Cloudy
The sky is gray and white and cloudy,
Sometimes I think it's hanging down on me.
And it's a hitchhike a hundred miles.
I'm a rag-a-muffin child.
Pointed finger-painted smile.
I left my shadow waiting down the road for me a while.

Cloudy
My thoughts are scattered and they're cloudy,
They have no borders, no boundaries.
They echo and they swell
From Tolstoy to Tinker Bell.
Down from Berkeley to Carmel.
Got some pictures in my pocket and a lot of time to kill.

Hey sunshine
I haven't seen you in a long time.
Why don't you show your face and bend my mind?
These clouds stick to the sky
Like floating questions, why?
And they linger there to die.
They don't know where they are going, and, my friend, neither do I.
```

File...The Output



```
C:\PROGRA~1\XINXS-1\JCREAT-1\GE2001.exe
Cloudy
The sky is gray and white and cloudy,
Sometimes I think it's hanging down on me.
And it's a hitchhike a hundred miles.
I'm a rag-a-muffin child.
Pointed finger-painted smile.
I left my shadow waiting down the road for me a while.

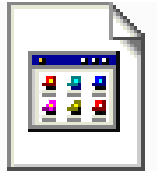
Cloudy
My thoughts are scattered and they're cloudy,
They have no borders, no boundaries.
They echo and they swell
From Tolstoy to Tinker Bell.
Down from Berkeley to Carmel.
Got some pictures in my pocket and a lot of time to kill.

Hey sunshine
I haven't seen you in a long time.
Why don't you show your face and bend my mind?
These clouds stick to the sky
Like floating questions, why?
And they linger there to die.
They don't know where they are going, and, my friend, neither do I.
Press any key to continue..._
```

Number Input

Computers are ideal for number crunching. Up until now, however, we have had to input the numbers in by hand...very tedious!

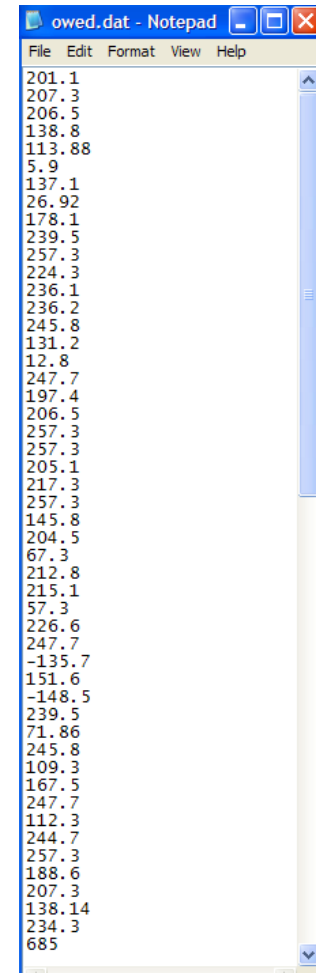
We will now input some numeric data from a file to demonstrate how file input can make this number crunching much more efficient.



owed.dat
DAT File
1 KB

Download Data File

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```
owed.dat - Notepad
File Edit Format View Help
201.1
207.3
206.5
138.8
113.88
5.9
137.1
26.92
178.1
239.5
257.3
224.3
236.1
236.2
245.8
131.2
12.8
247.7
197.4
206.5
257.3
257.3
205.1
217.3
257.3
145.8
204.5
67.3
212.8
215.1
57.3
226.6
247.7
-135.7
151.6
-148.5
239.5
71.86
245.8
109.3
167.5
247.7
112.3
244.7
257.3
188.6
207.3
138.14
234.3
685
```

Finished Code

```
MoneyOwed.java *
1  import java.io.*;
2
3  class MoneyOwed
4  {
5      public static void main(String args[]) throws IOException
6      {
7          FileReader fr = new FileReader("owed.dat");
8          BufferedReader br = new BufferedReader(fr);
9
10         double tally = 0;
11         String input;
12         int num = 0;
13         double amount;
14
15         while ((input = br.readLine()) != null)
16         {
17             // Print the content on the console
18             amount = Double.parseDouble(input);
19             tally = tally + amount;
20             num++;
21         }
22         double average;
23         average = tally/num;
24         System.out.println("The tally is " + tally);
25         System.out.println("The number of students is " + num);
26         System.out.println("The average owing is " + average);
27         //Close the input stream
28         fr.close();
29     }
30 }
31
32
```