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♥ Reading a text file in Java with the Scanner

Posted on [July 6, 2015](#) by [Arulkumaran Kumaraswamipillai](#)

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As a Java developer it is a very common task to read file contents to a String object. It is also very common in pre-interview written tests read the contents of a file and apply regex to split string, etc.

4 things to watch-out for in File processing

- 1) Files must be closed once read. "Try with resources" feature in java 7 is used to auto close the file once read.
- 2) Favor reading from a classpath over loading from an absolute path.
- 3) Scanner is for ASCII files, and a line-oriented scanner cannot be used for binary files. You have no guarantee that

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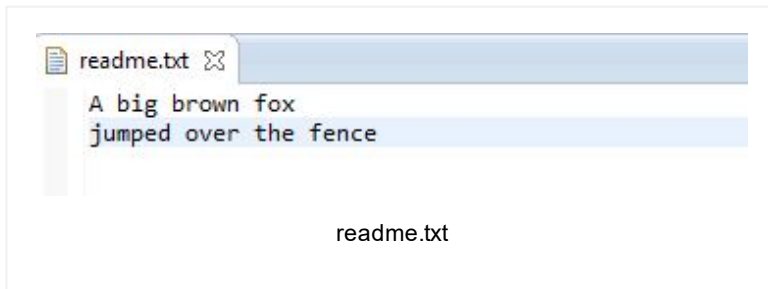
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the binary file even has “lines” delimited by newline characters.

4) Reading large files directly into memory can cause memory issues. Read [Processing large files efficiently in Java](#)

Java Scanner class in action

#1. Scanner class reading from an absolute file path



JDK 7 or later must be used to take advantage of the try with resources that auto closes the file.

```

1 package com.read.file;
2
3 import java.io.File;
4 import java.io.FileNotFoundException;
5 import java.util.Scanner;
6
7 public class MyFileReader {
8
9     public static void main(String[] args) {
10         String path = "C:\\Users\\akumaras\\work
11
12         //try with resource auto close the file
13         try (Scanner sc = new Scanner(new File(p
14             String readContent = sc.useDelimiter
15             System.out.println(readContent);
16         } catch (FileNotFoundException e) {
17             e.printStackTrace();
18         }
19     }
20 }

```

The “java.util.regex.Pattern class states:

“\Z” The end of the input but for the final terminator, if any.

“\z” The end of the input.

The extra “\” is added to escape, since backslash is a special character in Java String. For e.g. to print a \ or ” which are

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special in string literal you have to escape it with another \ which gives us \\ and \". Similarly, you need to escape "\"" in "\Z" with another \" which becomes "\\Z".

#2. Scanner class dynamically constructing an absolute path

```

1 package com.read.file;
2
3 import java.io.File;
4 import java.io.FileNotFoundException;
5 import java.util.Scanner;
6
7 public class MyFileReader {
8
9     public static void main(String[] args) {
10
11         //gives the current working folder
12         String currentWorkDir = System.getProper
13         //convert the package name to path
14         String packagePath = MyFileReader.class.
15
16         try (Scanner sc = new Scanner(new File(c
17             String readContent = sc.useDelimiter
18             System.out.println(readContent);
19         } catch (FileNotFoundException e) {
20             e.printStackTrace();
21         }
22     }
23 }

```

#3. Scanner class reading from the classpath relatively

The approaches #1 and #2 of reading a file via absolute path is not recommended because if the you move the deployed files to some other location then you will get "FileNotFoundException". A better approach is to read from your classpath. The method "getResourceAsStream" in the java.lang.Class API to the rescue.

```

1 package com.read.file;
2
3 import java.util.Scanner;
4
5 public class MyFileReader {
6
7     public static void main(String[] args) {
8         //getResourceAsStream to the rescue
9         try (Scanner sc = new Scanner( MyFileRea
10             String readContent = sc.useDelimiter
11             System.out.println(readContent);

```

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```

12     }
13     }
14 }

```

Why is this a better approach?

If you build a jar or war packaging of the above “MyFileReader” and “readme.txt” it can be deployed anywhere. For example, let’s build a jar file with Maven.

Step 1: Create a Maven Jar project

```
1 mvn archetype:generate -DgroupId=com.read.file -D
```

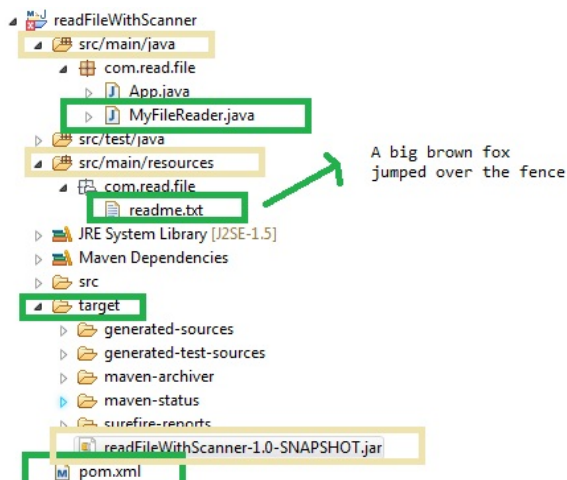
Step 2: Create the files MyFileReader.java & readme.txt

src/main/java: com.read.file.MyFileReader.java

src/main/resources: com.read.file.readme.txt

The “src/main/resources” folder can be created with right mouse click on “readFileWithScanner” and then “new → Source Folder” and then typing “src/main/resources” as the source folder.

After importing into eclipse looks like:



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Step 3: Ensure that the **pom.xml** uses Java 7 or later

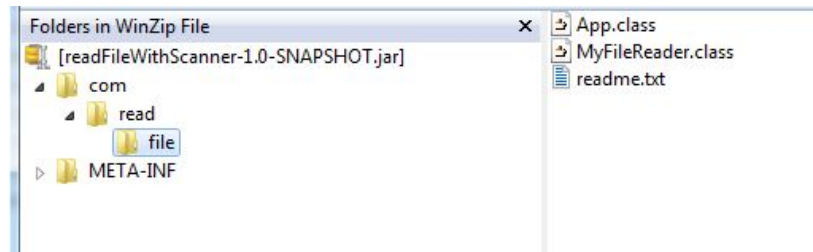
to take advantage of the “Try with resources” feature.

```
1 <project xmlns="http://maven.apache.org/POM/4.0.0"
2   xsi:schemaLocation="http://maven.apache.org/
3     <modelVersion>4.0.0</modelVersion>
4
5     <groupId>com.read.file</groupId>
6     <artifactId>readFileWithScanner</artifactId>
7     <version>1.0-SNAPSHOT</version>
8     <packaging>jar</packaging>
9
10    <name>readFileWithScanner</name>
11    <url>http://maven.apache.org</url>
12
13    <properties>
14      <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
15    </properties>
16
17    <dependencies>
18      <dependency>
19        <groupId>junit</groupId>
20        <artifactId>junit</artifactId>
21        <version>3.8.1</version>
22        <scope>test</scope>
23      </dependency>
24    </dependencies>
25
26    <build>
27      <plugins>
28        <plugin>
29          <groupId>org.apache.maven.plugins</groupId>
30          <artifactId>maven-compiler-plugin</artifactId>
31        </plugin>
32      </plugins>
33
34      <pluginManagement>
35        <plugins>
36          <plugin>
37            <groupId>org.apache.maven.plugins</groupId>
38            <artifactId>maven-compiler-plugin</artifactId>
39            <version>3.2</version>
40            <configuration>
41              <source>1.7</source>
42              <target>1.7</target>
43            </configuration>
44          </plugin>
45        </plugins>
46      </pluginManagement>
47    </build>
48  </project>
```

Step 4: Build the jar file

```
1 mvn clean package
```

Step 5: The built jar file looks like



jar file with the readme.txt and reader class file

Step 6: Copy this built jar file to say c:\temp folder and run

```
1 C:\Users\akumaras\projects>java -classpath c:\Tem
2 A big brown fox
3 jumped over the fence
```

So, you can run this jar file in any folder as the lookup of the file is relative to the classpath.

#4. 2 Scanners: one for reading the file line by line & the other for tokenizing the line on spaces

```
1 package com.read.file;
2
3 import java.util.Scanner;
4
5 public class MyFileReader {
6
7     public static void main(String[] args) {
8         Scanner fileScanner = new Scanner(MyFile
9         try {
10             while (fileScanner.hasNextLine()) {
11                 String line = fileScanner.nextLi
12                 Scanner lineScanner = new Scanne
13                 while (lineScanner.hasNext()) {
14                     String token = lineScanner.n
15                     System.out.println(token); //
16                 }
17                 lineScanner.close();
18             }
19         } finally {
20             fileScanner.close();
21         }
22     }
23 }
```

The output:

```
1 A
2 big
3 brown
4 fox
5 jumped
6 over
7 the
8 fence
```

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