

TASK 1

How did you use connection pooling?

Our project uses connection pooling by initializing our connection resource in our \META-INF\context.xml file and \WEB-INF\web.xml file. We call one resource our "jdbc/TestDB" which is used for reading from either master or slave's local database. The second resource is "jdbc/MasterDB" this resource is used for writing to the master database. By using connection pooling we have our connections cached for easy reuse for further use in the project rather than closing and reopening a connection to a database over and over. The following images are snapshots of where are connection and prepared statements can be found.

```
context.xml
1 <?xml version="1.0" encoding="UTF-8"?>
2
3 <Context>
4
5
6
7   <Resource name="jdbc/TestDB" auth="Container" type="javax.sql.DataSource"
8     maxTotal="100" maxIdle="30"
9     maxWaitMillis="10000"
10    username="mytestuser"
11    password="mypassword"
12    driverClassName="com.mysql.jdbc.Driver"
13    url="jdbc:mysql://localhost:3306/moviedb?autoReconnect=true&useSSL=false&cachePrepStmts=true"/>
14
15   <Resource name="jdbc/MasterDB" auth="Container" type="javax.sql.DataSource"
16     maxTotal="100" maxIdle="30"
17     maxWaitMillis="10000"
18    username="mytestuser"
19    password="mypassword"
20    driverClassName="com.mysql.jdbc.Driver"
21    url="jdbc:mysql://52.53.250.44:3306/moviedb?autoReconnect=true&useSSL=false&cachePrepStmts=true"/>
22
23 </Context>
```

src/default/BrowseByGenre.java - line 56-63

```
BrowseByGenre.java
42 * @see HttpServlet#doGet(HttpServletRequest request, HttpServletResponse response)
43 */
44 protected void doGet(HttpServletRequest request, HttpServletResponse response) throws
45 // TODO Auto-generated method stub
46 response.getWriter().append("Served at: ").append(request.getContextPath());
47 String genre= (String)request.getParameter("genre");
48 String genreId="";
49
50 //Connection con=DBConnection.getConnection();
51
52 PreparedStatement statement = null;
53 try {
54 //P5
55
56 Context initCtx = new InitialContext();
57
58 Context envCtx = (Context) initCtx.lookup("java:comp/env");
59
60 // Look up our data source
61 DataSource ds = (DataSource) envCtx.lookup("jdbc/TestDB");
62
63 Connection con=ds.getConnection();
64
65 //P5
66
67 String query="";
68 ResultSet result = null;
```

src/default/BrowseByTitle - line 53-60

```
BrowseByTitle.java
46
47
48     PreparedStatement statement = null;
49     try {
50
51         //P5 ~~~~~
52
53         Context initCtx = new InitialContext();
54
55         Context envCtx = (Context) initCtx.lookup("java:comp/env");
56
57         // Look up our data source
58         DataSource ds = (DataSource) envCtx.lookup("jdbc/TestDB");
59
60         Connection con=ds.getConnection();
61         //P5 ~~~~~
62
63
64         String query="";
65     }
```

src/default/GenreServlet - lines 73-80

```
GenreServlet.java
67
68         // create database connection
69         //Connection connection = DBConnection.getConnection();
70
71         //P5 ~~~~~
72
73         Context initCtx = new InitialContext();
74
75         Context envCtx = (Context) initCtx.lookup("java:comp/env");
76
77         // Look up our data source
78         DataSource ds = (DataSource) envCtx.lookup("jdbc/TestDB");
79
80         Connection con=ds.getConnection();
81
82         //P5~~~~~
83
```

src/default/insertMovie - lines 58-65

```
insertMovie.java  insertStar.java
38
39 /**
40  * @see HttpServlet#doGet(HttpServletRequest request, HttpServletResponse response)
41  */
42 protected void doGet(HttpServletRequest request, HttpServletResponse response) throws ServletException
43 // TODO Auto-generated method stub
44 String name= (String)request.getParameter("title");
45 String year=(String)request.getParameter("year");
46 String director= (String)request.getParameter("director");
47 String star=(String)request.getParameter("star");
48 String genre=(String)request.getParameter("genre");
49
50
51 //Connection con=DBConnection.getConnection();
52 Constants cons= new Constants();
53
54 CallableStatement csmt;
55 try {
56 //P5 ~~~~~
57
58 Context initCtx = new InitialContext();
59
60 Context envCtx = (Context) initCtx.lookup("java:comp/env");
61
62 // Look up our data source
63 DataSource ds = (DataSource) envCtx.lookup("jdbc/MasterDB");
64
65 Connection con=ds.getConnection();
66
67 //P5 ~~~~~
68
```

src/default/insertStar

lines 57-64

```
insertMovie.java  insertStar.java
50
51
52 PreparedStatement statement = null;
53
54 try {
55 //P5 ~~~~~
56
57 Context initCtx = new InitialContext();
58
59 Context envCtx = (Context) initCtx.lookup("java:comp/env");
60
61 // Look up our data source
62 DataSource ds = (DataSource) envCtx.lookup("jdbc/MasterDB");
63
64 Connection con=ds.getConnection();
65
66 //P5 ~~~~~
67
68
```

src/default/Login - 77-84

```
Login.java
70     try {
71
72         //Class.forName("com.mysql.jdbc.Driver").newInstance();
73
74         //Connection connection = DriverManager.getConnection(loginUrl,loginUser,lc
75         //P5 ~~~~~~
76
77         Context initCtx = new InitialContext();
78
79         Context envCtx = (Context) initCtx.lookup("java:comp/env");
80
81         // Look up our data source
82         DataSource ds = (DataSource) envCtx.lookup("jdbc/TestDB");
83
84         Connection con=ds.getConnection();
85
86         //P5~~~~~
87
88
```

src/default/LoginServletAndroid

61-68

```
Login.java  LoginServletAndroid.java
52     LoginResponse auth = new LoginResponse();
53     try {
54
55         //Class.forName("com.mysql.jdbc.Driver").newInstance();
56
57         //Connection connection = DriverManager.getConnection(loginUrl,loginUser,logir
58
59         //P5 ~~~~~~
60
61         Context initCtx = new InitialContext();
62
63         Context envCtx = (Context) initCtx.lookup("java:comp/env");
64
65         // Look up our data source
66         DataSource ds = (DataSource) envCtx.lookup("jdbc/TestDB");
67
68         Connection con=ds.getConnection();
69
70         //P5~~~~~
71
72
73         //Statement statement = con.createStatement();
```

src/default/SearchResults - lines 91-98

```
SearchResults.java
83      // Building page body
84      out.println("<body><h1>Movie Titles Found:</h1>");
85
86
87      try {
88
89          //P5 ~~~~~
90
91          Context initCtx = new InitialContext();
92
93          Context envCtx = (Context) initCtx.lookup("java:comp/env");
94
95          // Look up our data source
96          DataSource ds = (DataSource) envCtx.lookup("jdbc/TestDB");
97
98          Connection con=ds.getConnection();
99
100         //P5~~~~~
101
102
```

src/default/StarServlet - lines 63-70

```
StarServlet.java
58      out.println("<%@include file=\"navbar.jsp\" %>");
59
60      try {
61          //P5 ~~~~~
62
63          Context initCtx = new InitialContext();
64
65          Context envCtx = (Context) initCtx.lookup("java:comp/env");
66
67          // Look up our data source
68          DataSource ds = (DataSource) envCtx.lookup("jdbc/TestDB");
69
70          Connection con=ds.getConnection();
71
72          //P5~~~~~
73
74
```


src/helper/SaleActions - lines 51-58

```
42     try {
43
44         java.util.Date date = new java.util.Date();
45
46         //Class.forName("com.mysql.jdbc.Driver").newInstance();
47         //Connection connection = DriverManager.getConnection(loginUrl,loginUser,loginPa
48
49         //P5 ~~~~~
50
51         Context initCtx = new InitialContext();
52
53         Context envCtx = (Context) initCtx.lookup("java:comp/env");
54
55         // Look up our data source
56         DataSource ds = (DataSource) envCtx.lookup("jdbc/TestDB");
57
58         Connection con=ds.getConnection();
59
60         //P5~~~~~
61     }
```

src/helper/SearchManager - lines 26-33

```
SearchManager.java
1 package helper;
2
3 import java.sql.Connection;
17
18 public class SearchManager {
19     public static ArrayList<MovieListing> getSearchResults(MovieListing movie, String sn
20     ArrayList<MovieListing> list=new ArrayList<>();
21     try{
22         //Connection con=DBConnection.getConnection();
23
24         //P5 ~~~~~
25
26         Context initCtx = new InitialContext();
27
28         Context envCtx = (Context) initCtx.lookup("java:comp/env");
29
30         // Look up our data source
31         DataSource ds = (DataSource) envCtx.lookup("jdbc/TestDB");
32
33         Connection con=ds.getConnection();
34
35         //P5~~~~~
```

How did you use Prepared Statements?

Our prepared Statement can be found in our SearchManager as well, lines 43-51

```
43         PreparedStatement pst=con.prepareStatement(query);
44         pst.setString(1, "%" + movie.getTitle() + "%");
45         if(movie.getYear() != null){
46             pst.setString(2, "%" + movie.getYear().toString() + "%");
47         }else{
48             pst.setString(2, "");
49         }
50         pst.setString(3, "%" + movie.getDirector() + "%");
51         pst.setString(4, "%" + sn + "%");
```

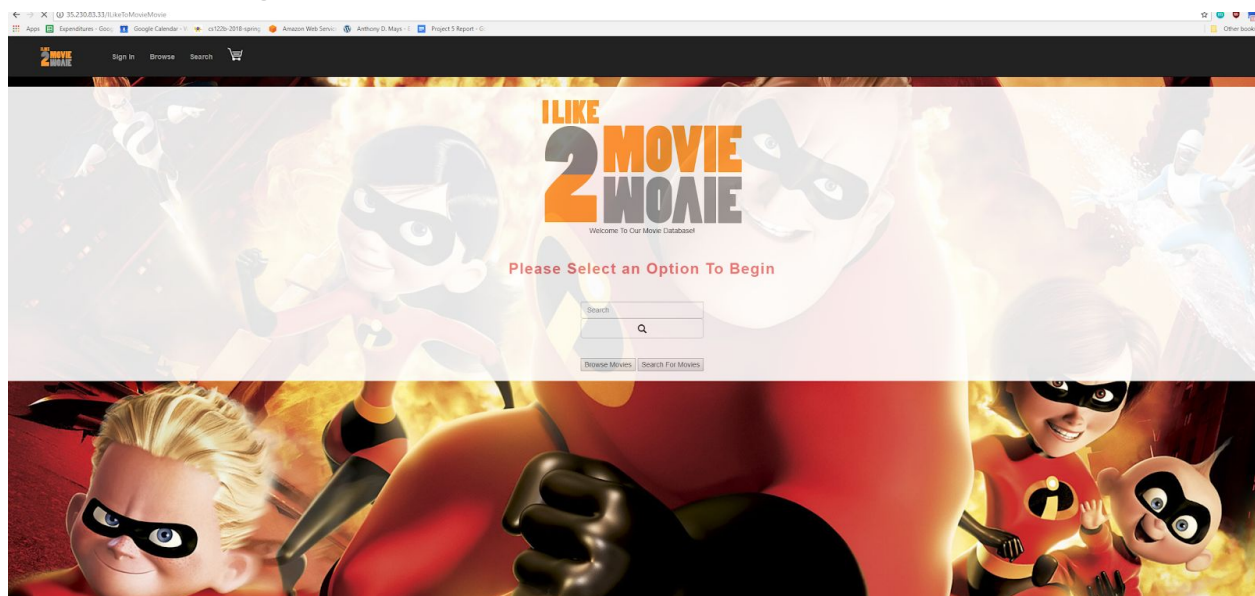
Task 2

Address of our AWS and Google Instance

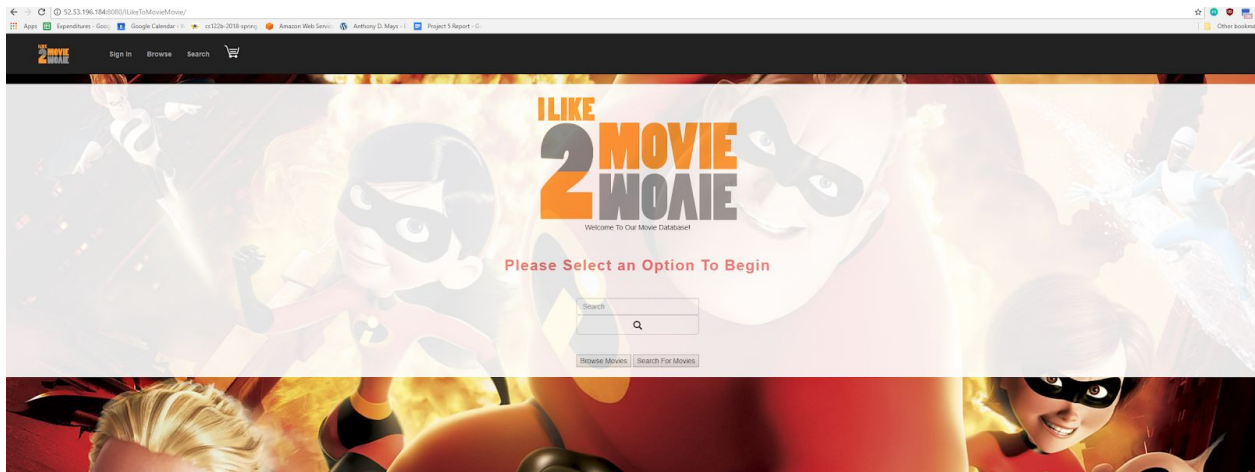
Project(Original)	52.53.196.184
Master	13.57.223.173
Slave	54.183.155.49
Google Cloud	35.230.83.33

Have you verified that they are accessible? Does Fablix site get opened both on Google's 80 port and AWS' 8080 port?

Fablix on Google 80: <http://35.230.83.33/ILikeToMovieMovie>



Fablix on AWS 8080: <http://52.53.196.184:8080/ILikeToMovieMovie/>



Explain how connection pooling works with two backend SQL (in your code)?

Connection pooling works by our load balancer which switches queries to the database from master and slave in order to avoid all queries being made to a single database. The balancer can be found in our instance's `etc/apache2/sites-enabled/000-default.conf` folder


```

Header add Set-Cookie "ROUTEID=.%{BALANCER_WORKER_ROUTE}e; path=/" env=BALANCER_
ROUTE_CHANGED

<Proxy "balancer://Session_balancer">
    #Master
    BalancerMember "http://13.57.223.173:8080/Session" route=1

    #Slave
    BalancerMember "http://54.183.155.49:8080/Session" route=2
ProxySet stickysession=ROUTEID
</Proxy>

<Proxy "balancer://TomcatTest_balancer">
    #master
    BalancerMember "http://13.57.223.173:8080/TomcatTest/"

    #slave
    BalancerMember "http://54.183.155.49:8080/TomcatTest/"
</Proxy>

<Proxy "balancer://ILikeToMovieMovie_balancer">
    #Master
    BalancerMember "http://13.57.223.173:8080/ILikeToMovieMovie" route=1

    #Slave
    BalancerMember "http://54.183.155.49:8080/ILikeToMovieMovie" route=2
ProxySet stickysession=ROUTEID
</Proxy>

<VirtualHost *:80>

    ProxyPass /TomcatTest balancer://TomcatTest_balancer
    ProxyPassReverse /TomcatTest balancer://TomcatTest_balancer

    ProxyPass /Session balancer://Session_balancer
    ProxyPassReverse /Session balancer://Session_balancer

    ProxyPass /ILikeToMovieMovie balancer://ILikeToMovieMovie_balancer
    ProxyPassReverse /ILikeToMovieMovie balancer://ILikeToMovieMovie_balance

```

How read/write requests were routed?

Write requests were routed to the MASTERDB while reads were routed to TestDB these can be found in our insertMovie.java and insertStar.java

src/default/insertMovie - lines 58-65

```
insertMovie.java  insertStar.java
38
39 /**
40  * @see HttpServlet#doGet(HttpServletRequest request, HttpServletResponse response)
41  */
42 protected void doGet(HttpServletRequest request, HttpServletResponse response) throws ServletException
43 // TODO Auto-generated method stub
44 String name= (String)request.getParameter("title");
45 String year=(String)request.getParameter("year");
46 String director= (String)request.getParameter("director");
47 String star=(String)request.getParameter("star");
48 String genre=(String)request.getParameter("genre");
49
50
51 //Connection con=DBConnection.getConnection();
52 Constants cons= new Constants();
53
54 CallableStatement csmt;
55 try {
56 //P5 ~~~~~
57
58 Context initCtx = new InitialContext();
59 Context envCtx = (Context) initCtx.lookup("java:comp/env");
60
61
62 // Look up our data source
63 DataSource ds = (DataSource) envCtx.lookup("jdbc/MasterDB");
64
65 Connection con=ds.getConnection();
66
67 //P5~~~~~
68
```

src/default/insertStar

lines 57-64

```
insertMovie.java  insertStar.java
50
51
52 PreparedStatement statement = null;
53
54 try {
55 //P5 ~~~~~
56
57 Context initCtx = new InitialContext();
58 Context envCtx = (Context) initCtx.lookup("java:comp/env");
59
60 // Look up our data source
61 DataSource ds = (DataSource) envCtx.lookup("jdbc/MasterDB");
62
63 Connection con=ds.getConnection();
64
65 //P5~~~~~
66
67
68
```

TASK 3

Have you uploaded the log files to Github? Where is it located?

The log files are found in the folder Reports. The text files are the logs for each of the tests.

Have you uploaded the HTML file (with all sections including analysis, written up) to Github? Where is it located?

The HTML file is also located in the Reports folder called jmeter-report.html

Have you uploaded the script to Github? Where is it located?

Our log script is found in the src/helper folder called LogFileParser.java.

Have you uploaded the WAR file and README to Github? Where is it located?

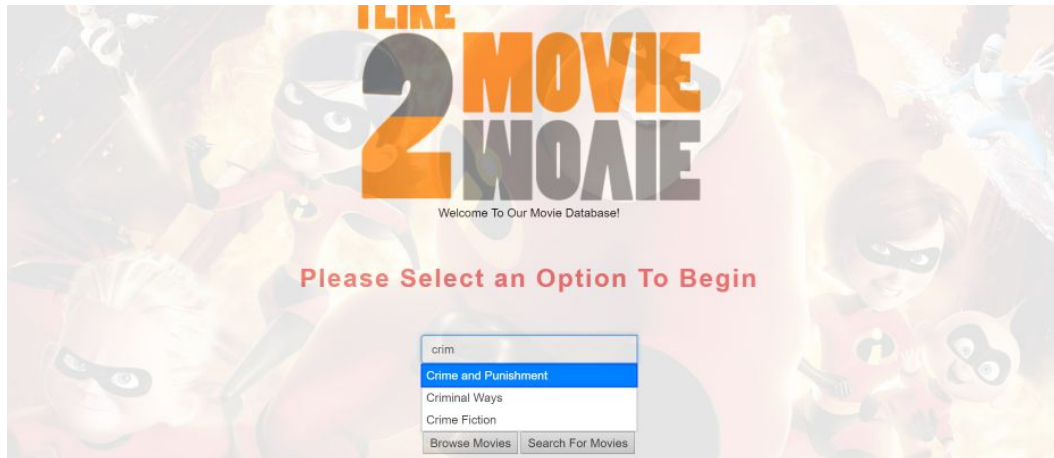
The WAR file can be found in the default folder, it is called ILikeToMovieMovie.war

In this task, we prepared (1) the average time it takes for the search servlet to run completely for a query (called TS), and (2) the average time spent on the parts that use JDBC, per query (called TJ)

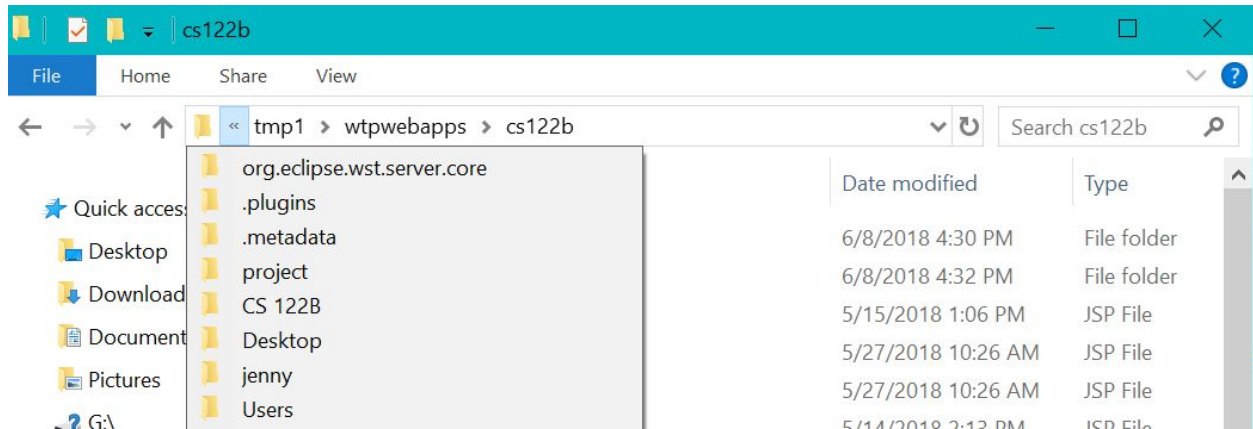
- We prepared log statements for our main search servlet.

```
AdvanceSearch.java  LogFileParser.java
1
2*import java.io.BufferedWriter;
26
27
28
29/**
30 * Servlet implementation class AdvanceSearch
31 */
32@WebServlet("/AdvanceSearch")
33public class AdvanceSearch extends HttpServlet {
34
35    long startTimeTS = System.nanoTime();
36    private static final long serialVersionUID = 1L;
37
38    /**
39     * @see HttpServlet#HttpServlet()
40     */
41
42
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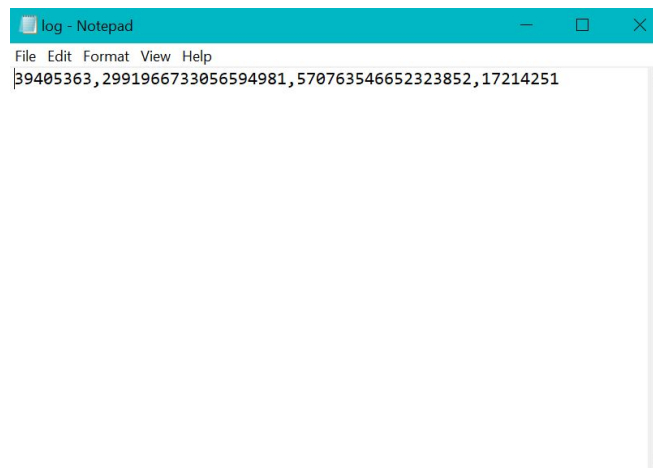
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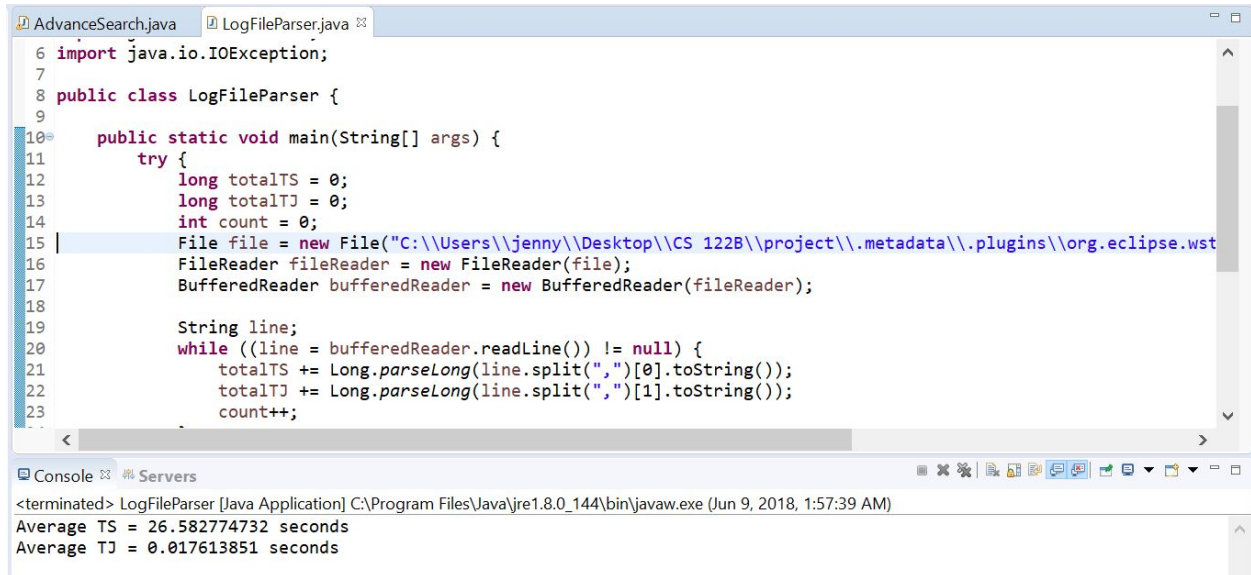
- When running from eclipse, the log.txt file gets written to a temporary location. In this specific case, this is where my log.txt was located:



- However, once you deploy your application to the Apache Tomcat servlet container everything will work as expected and file will be created in the root folder of the webapp.
- Once the log is located, it should contain sets of numbers (TS + TJ) , similar to the follow:



- We have also generated a Log Parser as shown:



```
AdvanceSearch.java | LogFileParser.java
6 import java.io.IOException;
7
8 public class LogFileParser {
9
10     public static void main(String[] args) {
11         try {
12             long totalTS = 0;
13             long totalTJ = 0;
14             int count = 0;
15             File file = new File("C:\\Users\\jenny\\Desktop\\CS 122B\\project\\metadata\\plugins\\org.eclipse.wst
16             FileReader fileReader = new FileReader(file);
17             BufferedReader bufferedReader = new BufferedReader(fileReader);
18
19             String line;
20             while ((line = bufferedReader.readLine()) != null) {
21                 totalTS += Long.parseLong(line.split(",")[0].toString());
22                 totalTJ += Long.parseLong(line.split(",")[1].toString());
23                 count++;
24             }
25         } catch (IOException e) {
26             e.printStackTrace();
27         }
28     }
29 }
```

Console Servers

<terminated> LogFileParser [Java Application] C:\Program Files\Java\jre1.8.0_144\bin\javaw.exe (Jun 9, 2018, 1:57:39 AM)

Average TS = 26.582774732 seconds

Average TJ = 0.017613851 seconds

- On line 15 of the servlet, you must insert the path which your log.txt file is located at



```
AdvanceSearch.java | *LogFileParser.java
6 import java.io.IOException;
7
8 public class LogFileParser {
9
10     public static void main(String[] args) {
11         try {
12             long totalTS = 0;
13             long totalTJ = 0;
14             int count = 0;
15             File file = new File("INSERT_PATH_HERE\\log.txt");
16             FileReader fileReader = new FileReader(file);
17             BufferedReader bufferedReader = new BufferedReader(fileReader);
18
19             String line;
20             while ((line = bufferedReader.readLine()) != null) {
21                 totalTS += Long.parseLong(line.split(",")[0].toString());
22                 totalTJ += Long.parseLong(line.split(",")[1].toString());
23                 count++;
24             }
25         } catch (IOException e) {
26             e.printStackTrace();
27         }
28     }
29 }
```

Console Servers

<terminated> LogFileParser [Java Application] C:\Program Files\Java\jre1.8.0_144\bin\javaw.exe (Jun 9, 2018, 1:57:39 AM)

Average TS = 26.582774732 seconds

Average TJ = 0.017613851 seconds

- The console will generate the average TS and TJ

INSTRUCTIONS FOR README:

To run the scripts to parse the log files:

- 1) Run the webapp and attempt search activities, which should be the search bar located on index.jsp.
- 2) Locate the log.txt file, which should be somewhere within
 \workspace\metadata\plugins\org.eclipse.wst.server.core\tmp1\wtpwebapps\
 If you're running the files using Eclipse, or in the WebContent folder (root) when
 deployed on a Tomcat servlet container.
- 3) Copy the directory path and paste it in LogFileParser.java, on line 15, where
 File file = new File("INSERT_PATH_HERE\\log.txt")
- 4) Run LogFileParser.java to generate Average TS and Average TJ

Refer to "TASK 3" of the report for snapshots and more detailed instructions.