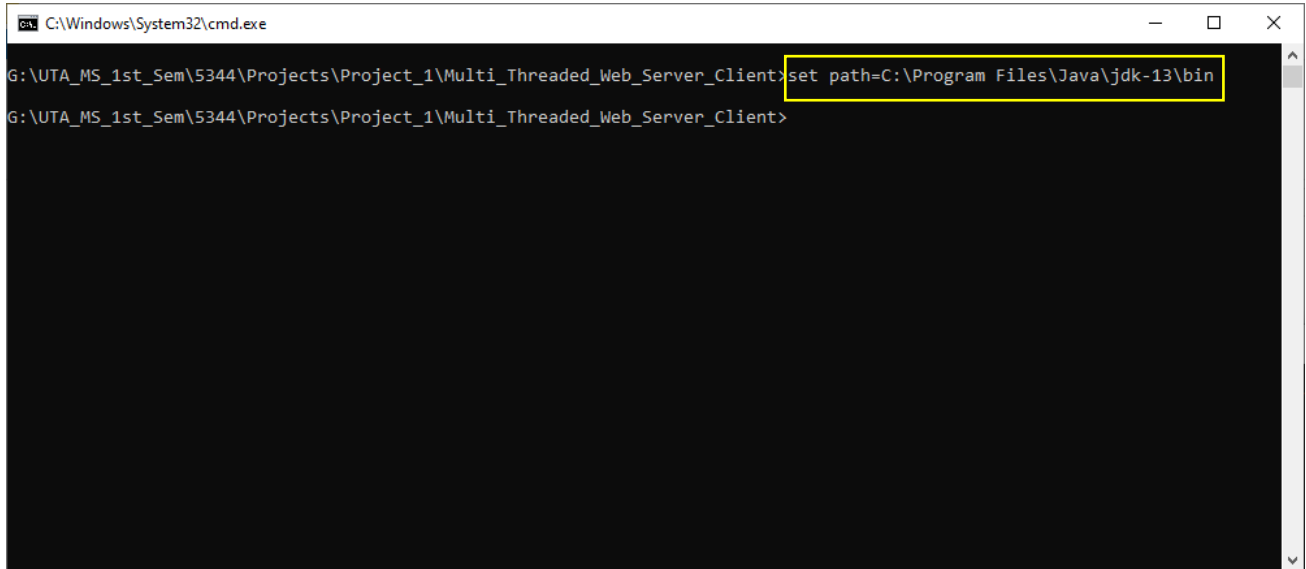


## Set Path for Java

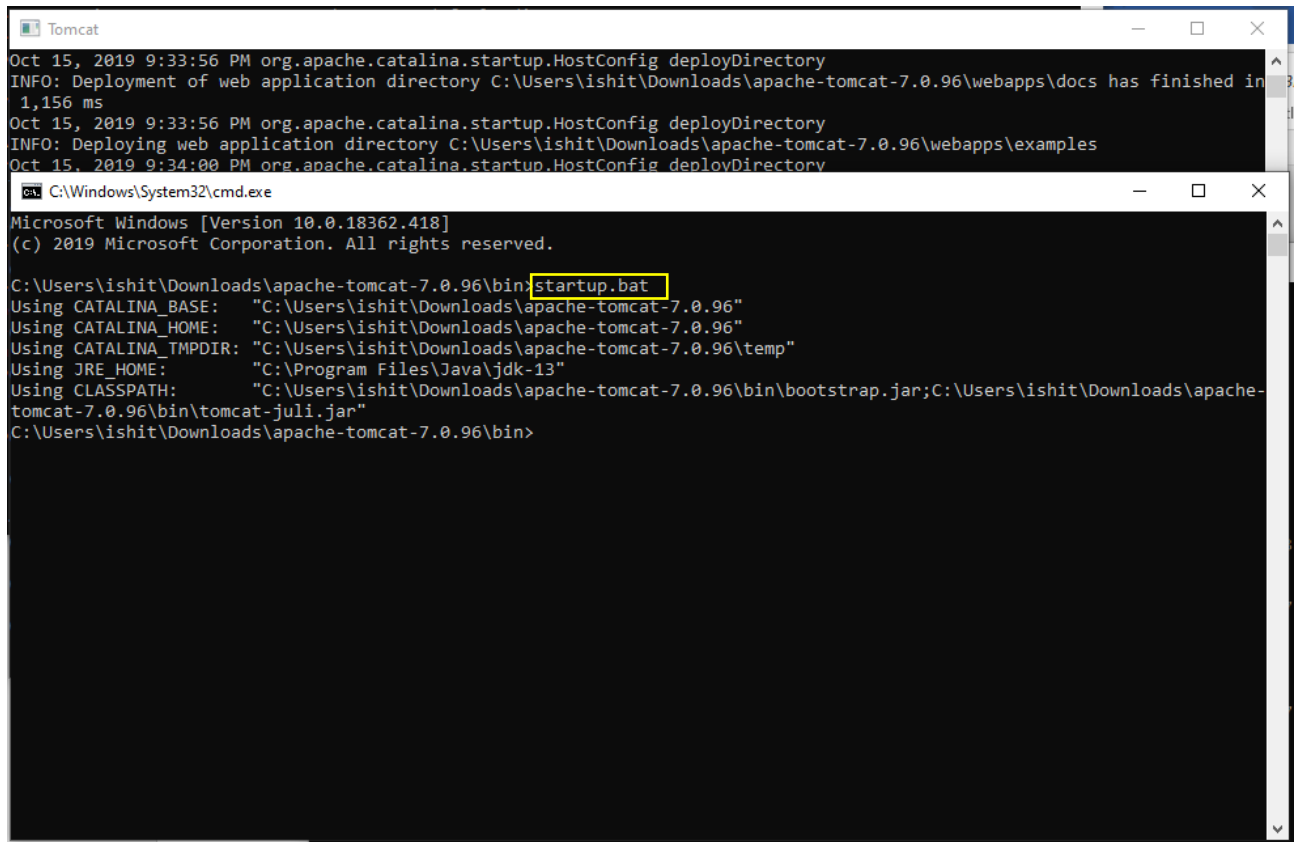


```
C:\Windows\System32\cmd.exe

G:\UTA_MS_1st_Sem\5344\Projects\Project_1\Multi_Threaded_Web_Server_Client> set path=C:\Program Files\Java\jdk-13\bin

G:\UTA_MS_1st_Sem\5344\Projects\Project_1\Multi_Threaded_Web_Server_Client>
```

## Starting Tomcat Server

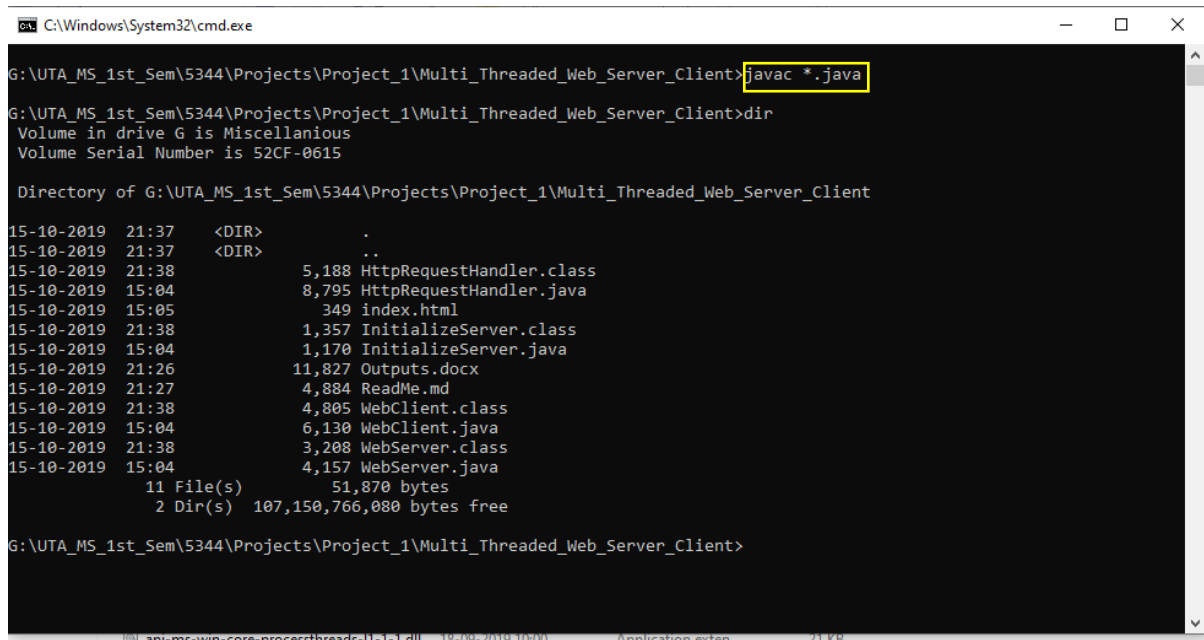


```
Tomcat
Oct 15, 2019 9:33:56 PM org.apache.catalina.startup.HostConfig deployDirectory
INFO: Deployment of web application directory C:\Users\ishit\Downloads\apache-tomcat-7.0.96\webapps\docs has finished in 1,156 ms
Oct 15, 2019 9:33:56 PM org.apache.catalina.startup.HostConfig deployDirectory
INFO: Deploying web application directory C:\Users\ishit\Downloads\apache-tomcat-7.0.96\webapps\examples
Oct 15, 2019 9:34:00 PM org.apache.catalina.startup.HostConfig deployDirectory

C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.18362.418]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\ishit\Downloads\apache-tomcat-7.0.96\bin> startup.bat
Using CATALINA_BASE: "C:\Users\ishit\Downloads\apache-tomcat-7.0.96"
Using CATALINA_HOME: "C:\Users\ishit\Downloads\apache-tomcat-7.0.96"
Using CATALINA_TMPDIR: "C:\Users\ishit\Downloads\apache-tomcat-7.0.96\temp"
Using JRE_HOME: "C:\Program Files\Java\jdk-13"
Using CLASSPATH: "C:\Users\ishit\Downloads\apache-tomcat-7.0.96\bin\bootstrap.jar;C:\Users\ishit\Downloads\apache-tomcat-7.0.96\bin\tomcat-juli.jar"
C:\Users\ishit\Downloads\apache-tomcat-7.0.96\bin>
```

Compiling all .java files in the folder



```
C:\Windows\System32\cmd.exe

G:\UTA_MS_1st_Sem\5344\Projects\Project_1\Multi_Threated_Web_Server_Client>javac *.java

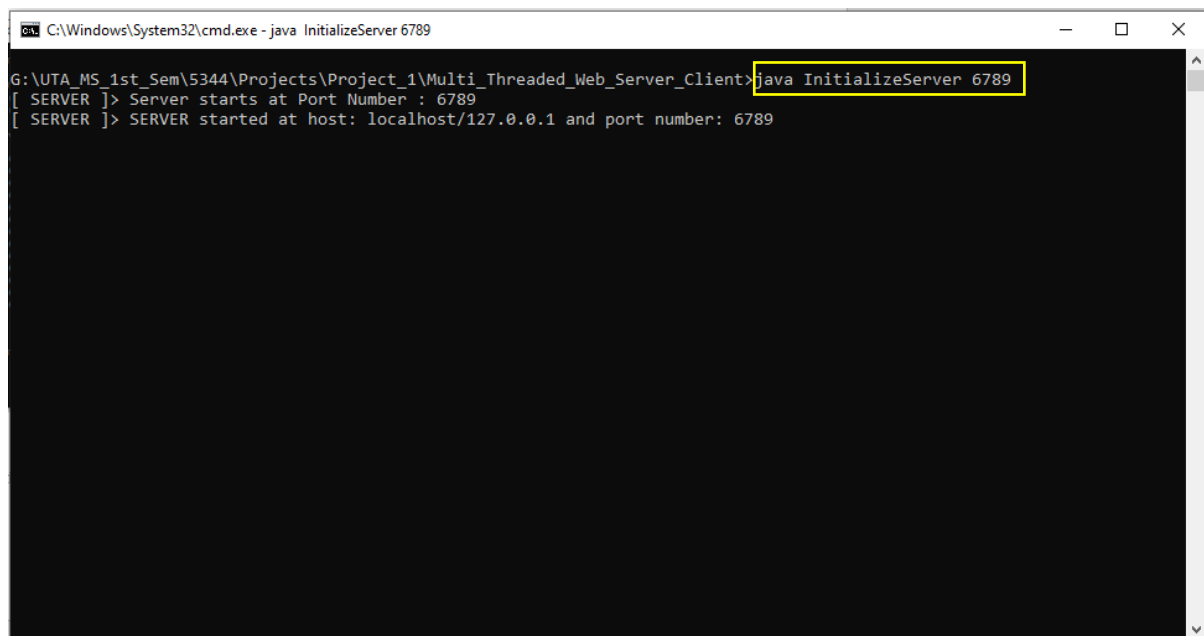
G:\UTA_MS_1st_Sem\5344\Projects\Project_1\Multi_Threated_Web_Server_Client>dir
Volume in drive G is Miscellaneous
Volume Serial Number is 52CF-0615

Directory of G:\UTA_MS_1st_Sem\5344\Projects\Project_1\Multi_Threated_Web_Server_Client

15-10-2019  21:37    <DIR>          .
15-10-2019  21:37    <DIR>          ..
15-10-2019  21:38             5,188 HttpRequestHandler.class
15-10-2019  15:04             8,795 HttpRequestHandler.java
15-10-2019  15:05              349 index.html
15-10-2019  21:38             1,357 InitializeServer.class
15-10-2019  15:04             1,170 InitializeServer.java
15-10-2019  21:26            11,827 Outputs.docx
15-10-2019  21:27             4,884 ReadMe.md
15-10-2019  21:38             4,805 WebClient.class
15-10-2019  15:04             6,130 WebClient.java
15-10-2019  21:38             3,208 WebServer.class
15-10-2019  15:04             4,157 WebServer.java
               11 File(s)          51,870 bytes
               2 Dir(s)  107,150,766,080 bytes free

G:\UTA_MS_1st_Sem\5344\Projects\Project_1\Multi_Threated_Web_Server_Client>
```

Initializing the web server and starting it on a particular port number (6789)

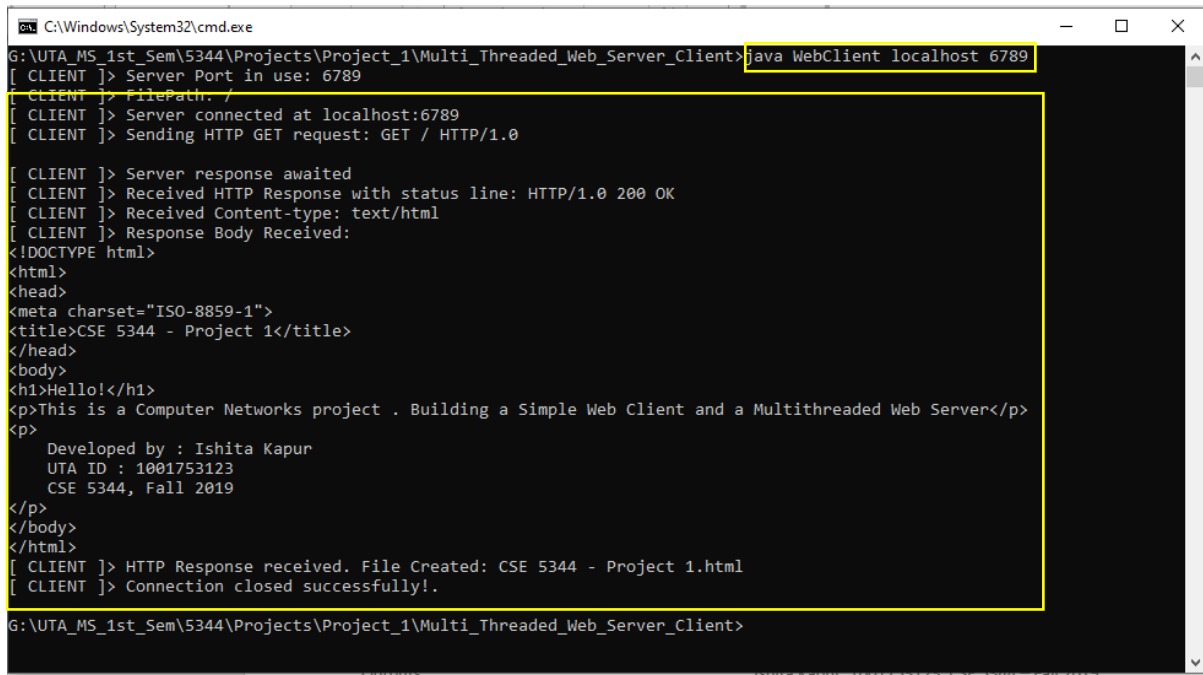


```
C:\Windows\System32\cmd.exe - java InitializeServer 6789

G:\UTA_MS_1st_Sem\5344\Projects\Project_1\Multi_Threated_Web_Server_Client>java InitializeServer 6789
[ SERVER ]> Server starts at Port Number : 6789
[ SERVER ]> SERVER started at host: localhost/127.0.0.1 and port number: 6789
```

Client connecting to the server using port 6789.

Web client extracts status line and displays it on the command prompt. Content-type and file content is also displayed. Output on client side is as follows:

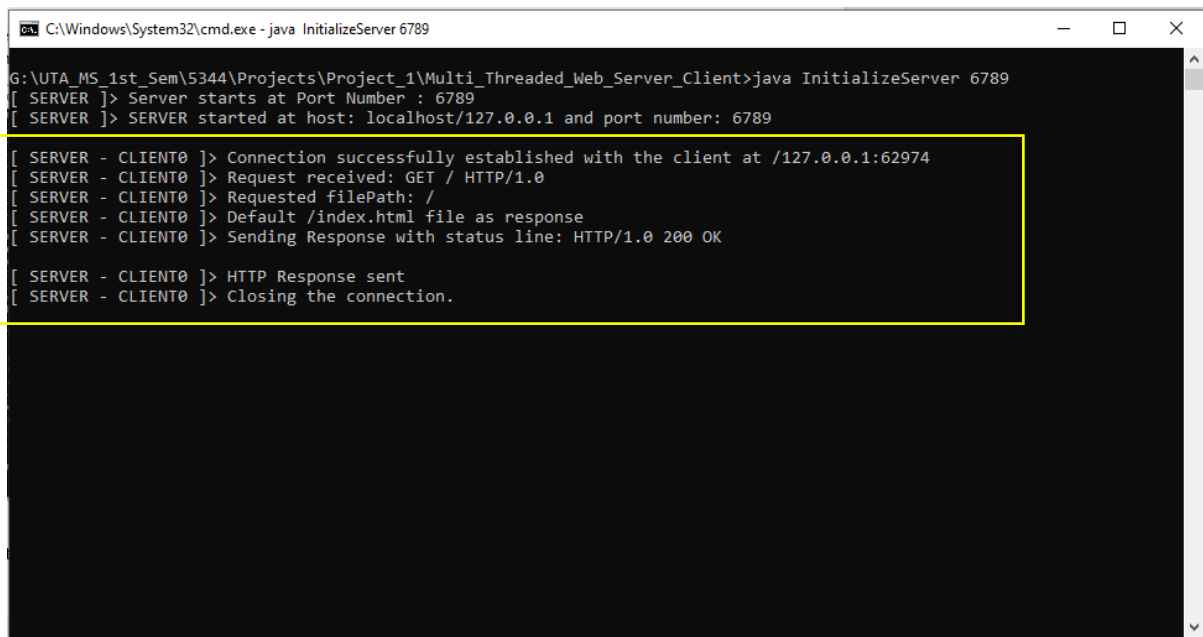


```
C:\Windows\System32\cmd.exe
G:\UTA_MS_1st_Sem\5344\Projects\Project_1\Multi_Threaded_Web_Server_Client>java WebClient localhost 6789
[ CLIENT ]> Server Port in use: 6789
[ CLIENT ]> FilePath: /
[ CLIENT ]> Server connected at localhost:6789
[ CLIENT ]> Sending HTTP GET request: GET / HTTP/1.0

[ CLIENT ]> Server response awaited
[ CLIENT ]> Received HTTP Response with status line: HTTP/1.0 200 OK
[ CLIENT ]> Received Content-type: text/html
[ CLIENT ]> Response Body Received:
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>CSE 5344 - Project 1</title>
</head>
<body>
<h1>Hello!</h1>
<p>This is a Computer Networks project . Building a Simple Web Client and a Multithreaded Web Server</p>
<p>
    Developed by : Ishita Kapur
    UTA ID : 1001753123
    CSE 5344, Fall 2019
  </p>
</body>
</html>
[ CLIENT ]> HTTP Response received. File Created: CSE 5344 - Project 1.html
[ CLIENT ]> Connection closed successfully!

G:\UTA_MS_1st_Sem\5344\Projects\Project_1\Multi_Threaded_Web_Server_Client>
```

Output on server side is as follows:



```
C:\Windows\System32\cmd.exe - java InitializeServer 6789
G:\UTA_MS_1st_Sem\5344\Projects\Project_1\Multi_Threaded_Web_Server_Client>java InitializeServer 6789
[ SERVER ]> Server starts at Port Number : 6789
[ SERVER ]> SERVER started at host: localhost/127.0.0.1 and port number: 6789

[ SERVER - CLIENT0 ]> Connection successfully established with the client at /127.0.0.1:62974
[ SERVER - CLIENT0 ]> Request received: GET / HTTP/1.0
[ SERVER - CLIENT0 ]> Requested filePath: /
[ SERVER - CLIENT0 ]> Default /index.html file as response
[ SERVER - CLIENT0 ]> Sending Response with status line: HTTP/1.0 200 OK

[ SERVER - CLIENT0 ]> HTTP Response sent
[ SERVER - CLIENT0 ]> Closing the connection.
```

If the file (/hey.html in the below screenshot) does not exist on the server the output on the client side is as follows:

```
C:\Windows\System32\cmd.exe
</body>
</html>
[ CLIENT ]> HTTP Response received. File Created: CSE 5344 - Project 1.html
[ CLIENT ]> Connection closed successfully!.

G:\UTA_MS_1st_Sem\5344\Projects\Project_1\Multi_Threaded_Web_Server_Client> java WebClient localhost 6789 /hey.html
[ CLIENT ]> Server Port in use: 6789
[ CLIENT ]> FilePath: /hey.html
[ CLIENT ]> Server connected at localhost:6789
[ CLIENT ]> Sending HTTP GET request: GET /hey.html HTTP/1.0

[ CLIENT ]> Server response awaited
[ CLIENT ]> Received HTTP Response with status line: HTTP/1.0 404 Not Found
[ CLIENT ]> Received Content-type: text/html
[ CLIENT ]> Response Body Received:
<!doctype html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Error 404</title>
</head>
<body>
  <b>ErrorCode:</b> 404
  <br>
  <b>Error Message:</b> The requested file does not exist on this server.
</body>
</html>
[ CLIENT ]> HTTP Response received. File Created: Error 404.html
[ CLIENT ]> Connection closed successfully!.

G:\UTA_MS_1st_Sem\5344\Projects\Project_1\Multi_Threaded_Web_Server_Client>
```

Output of the server side is as follows:

```
C:\Windows\System32\cmd.exe - java InitializeServer 6789
G:\UTA_MS_1st_Sem\5344\Projects\Project_1\Multi_Threaded_Web_Server_Client> java InitializeServer 6789
[ SERVER ]> Server starts at Port Number : 6789
[ SERVER ]> SERVER started at host: localhost/127.0.0.1 and port number: 6789

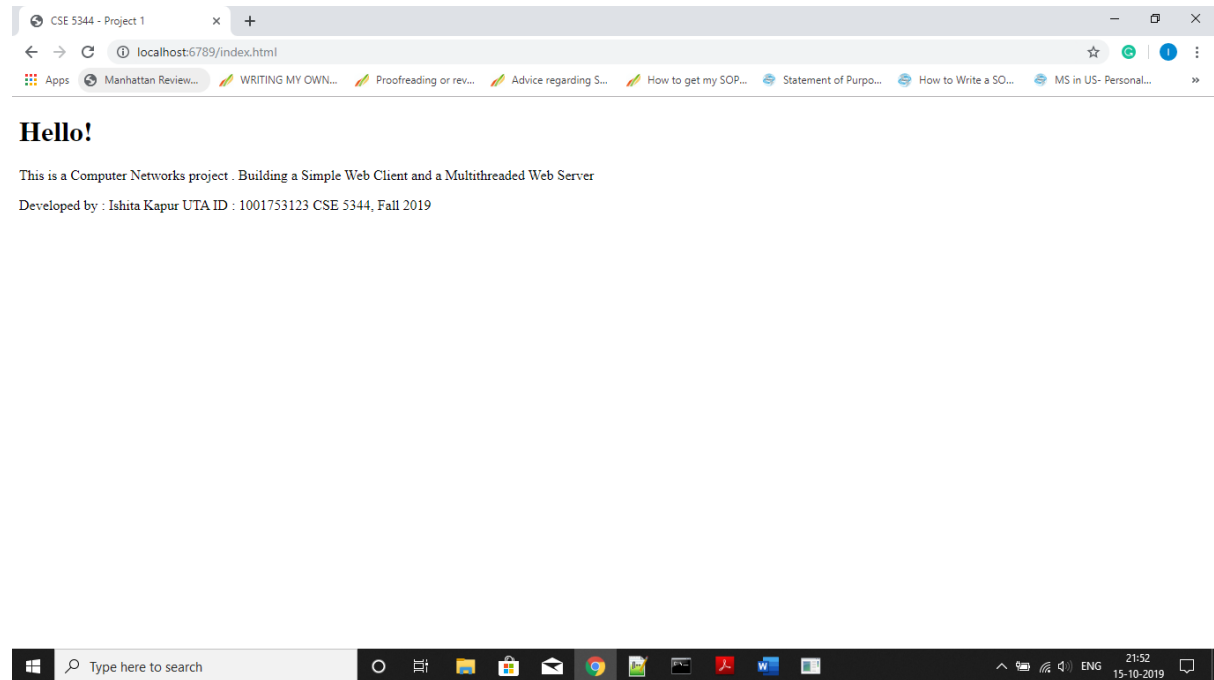
[ SERVER - CLIENT0 ]> Connection successfully established with the client at /127.0.0.1:62974
[ SERVER - CLIENT0 ]> Request received: GET / HTTP/1.0
[ SERVER - CLIENT0 ]> Requested filePath: /
[ SERVER - CLIENT0 ]> Default /index.html file as response
[ SERVER - CLIENT0 ]> Sending Response with status line: HTTP/1.0 200 OK

[ SERVER - CLIENT0 ]> HTTP Response sent
[ SERVER - CLIENT0 ]> Closing the connection.

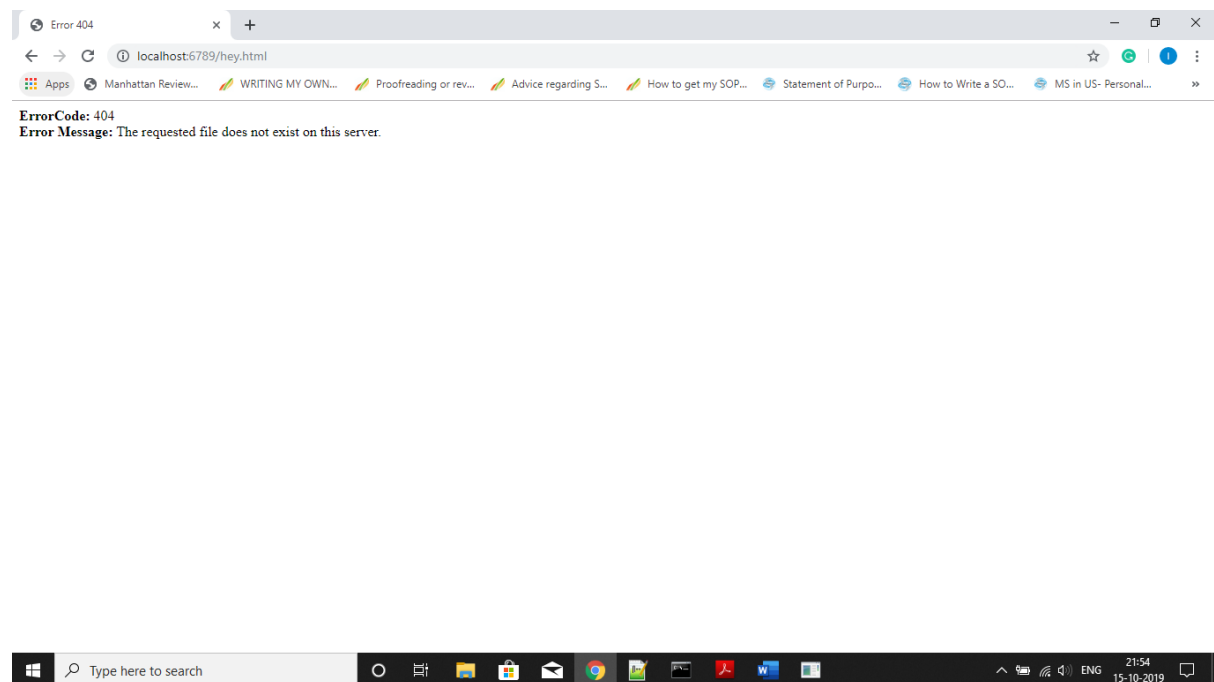
[ SERVER - CLIENT1 ]> Connection successfully established with the client at /127.0.0.1:62985
[ SERVER - CLIENT1 ]> Request received: GET /hey.html HTTP/1.0
[ SERVER - CLIENT1 ]> Requested filePath: /hey.html
[ SERVER - CLIENT1 ]> ERROR caught: Requested filePath ./hey.html does not exist
[ SERVER - CLIENT1 ]> Sending Response with status line: HTTP/1.0 404 Not Found

[ SERVER - CLIENT1 ]> HTTP Response sent
[ SERVER - CLIENT1 ]> Closing the connection.
```

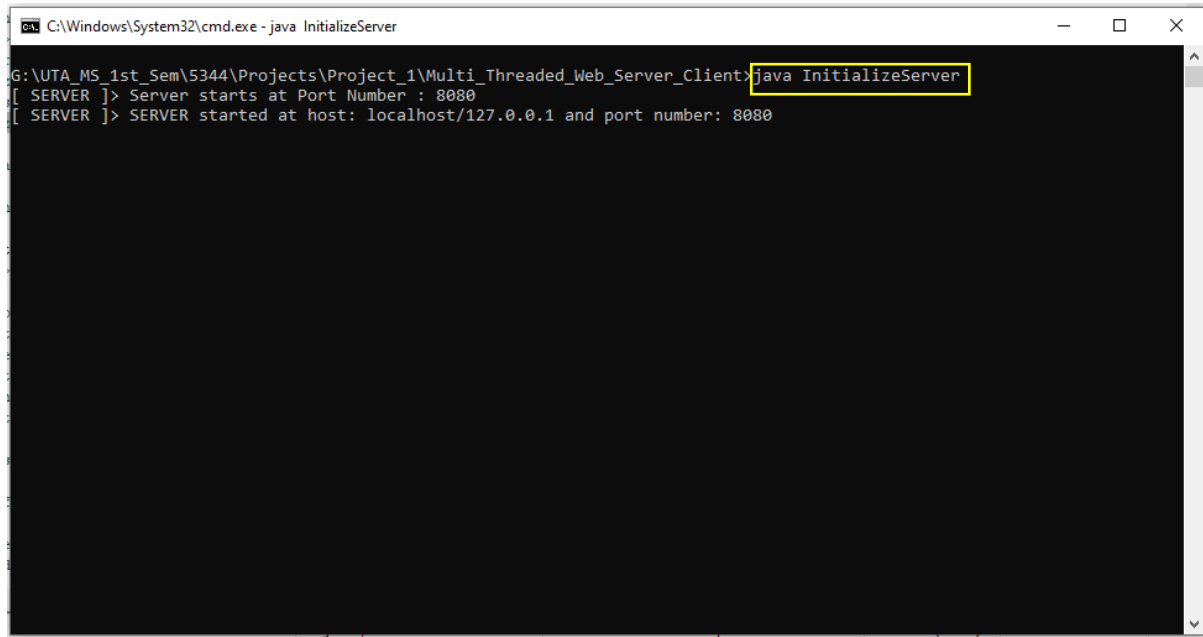
### Browser output for index.html existing on the server



### Browser output for hey.html not existing on the server



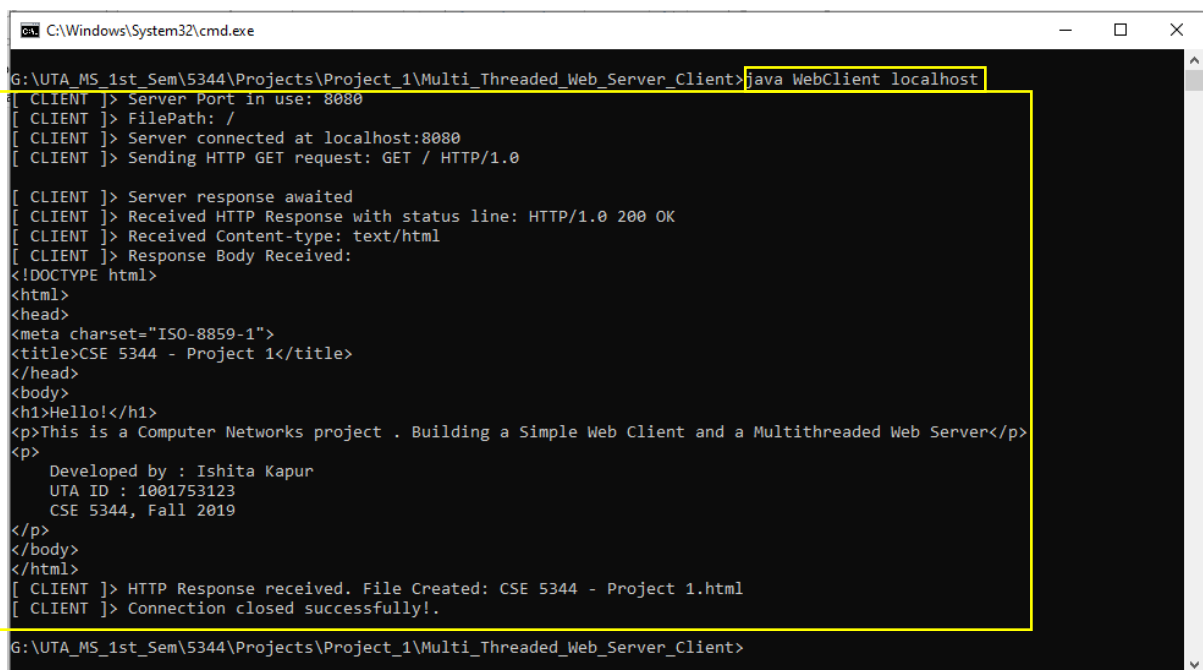
Initializing the web server and starting it on a default port (8080)



```
C:\Windows\System32\cmd.exe - java InitializeServer
G:\UTA_MS_1st_Sem\5344\Projects\Project_1\Multi_Threaded_Web_Server_Client>java InitializeServer
[ SERVER ]> Server starts at Port Number : 8080
[ SERVER ]> SERVER started at host: localhost/127.0.0.1 and port number: 8080
```

Client connecting to the server using default port 8080. Since no filename is mentioned it displays default html (/index.html)

Web client extracts status line and displays it on the command prompt. Content-type and file content is also displayed. Output on client side is as follows:

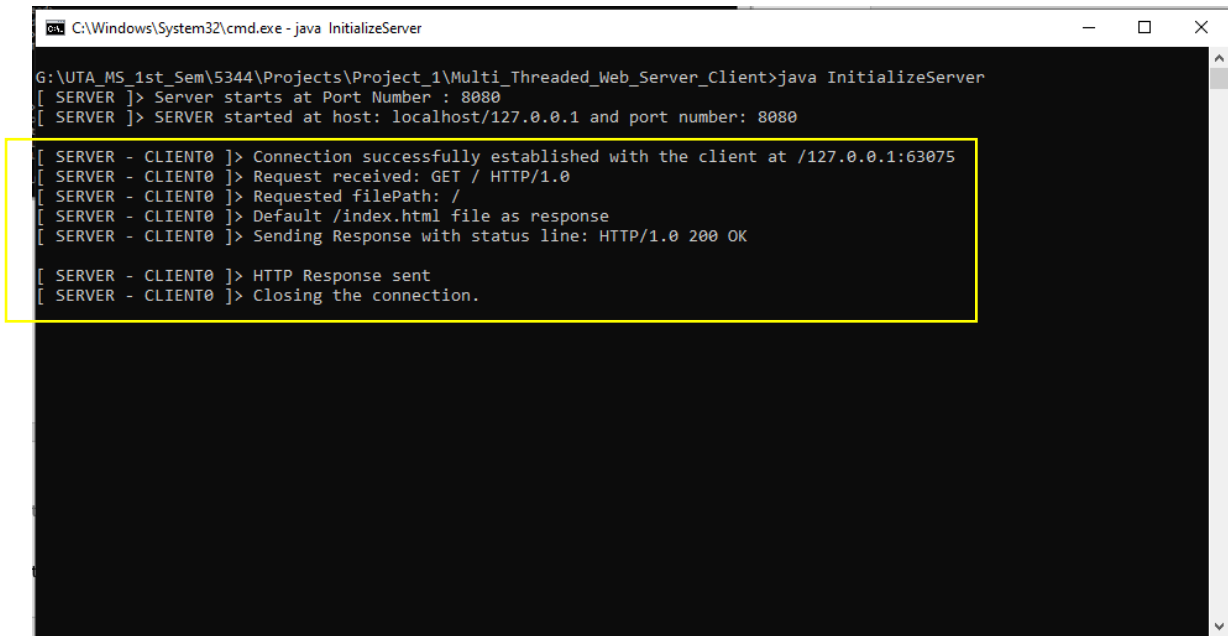


```
C:\Windows\System32\cmd.exe
G:\UTA_MS_1st_Sem\5344\Projects\Project_1\Multi_Threaded_Web_Server_Client>java WebClient localhost
[ CLIENT ]> Server Port in use: 8080
[ CLIENT ]> FilePath: /
[ CLIENT ]> Server connected at localhost:8080
[ CLIENT ]> Sending HTTP GET request: GET / HTTP/1.0

[ CLIENT ]> Server response awaited
[ CLIENT ]> Received HTTP Response with status line: HTTP/1.0 200 OK
[ CLIENT ]> Received Content-type: text/html
[ CLIENT ]> Response Body Received:
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>CSE 5344 - Project 1</title>
</head>
<body>
<h1>Hello!</h1>
<p>This is a Computer Networks project . Building a Simple Web Client and a Multithreaded Web Server</p>
<p>
    Developed by : Ishita Kapur
    UTA ID : 1001753123
    CSE 5344, Fall 2019
  </p>
</body>
</html>
[ CLIENT ]> HTTP Response received. File Created: CSE 5344 - Project 1.html
[ CLIENT ]> Connection closed successfully!

G:\UTA_MS_1st_Sem\5344\Projects\Project_1\Multi_Threaded_Web_Server_Client>
```

Output on the server side is as follows:



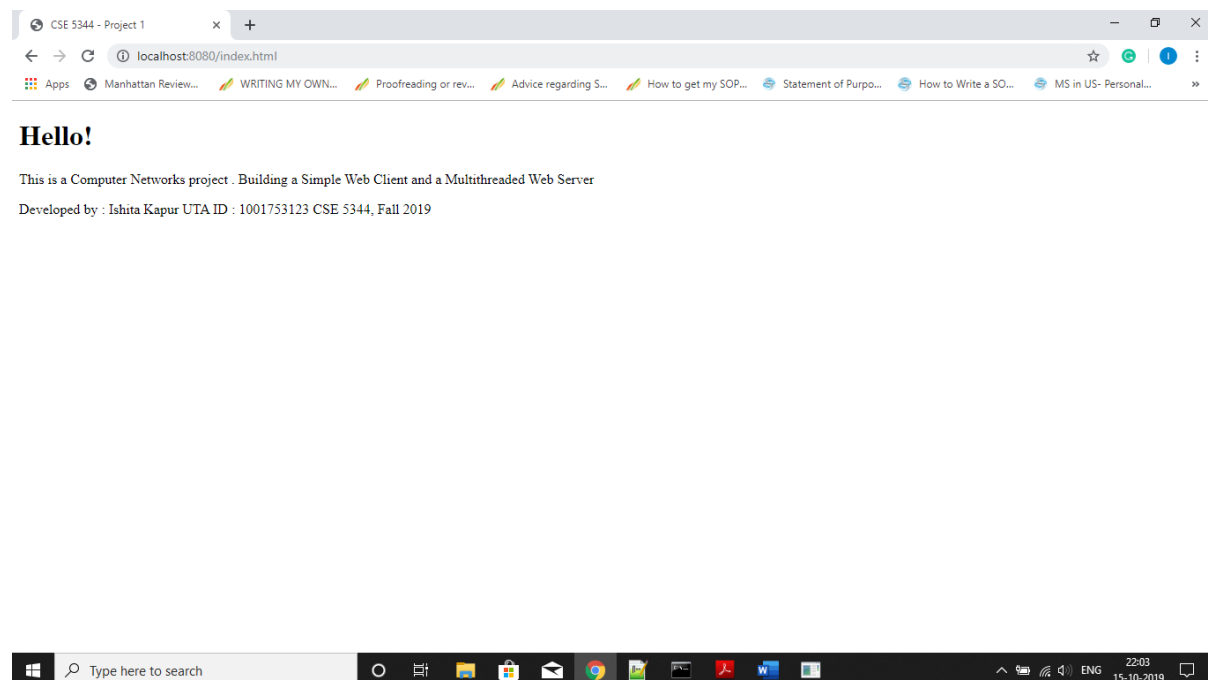
```
C:\Windows\System32\cmd.exe - java InitializeServer

G:\UTA_MS_1st_Sem\5344\Projects\Project_1\Multi_Threaded_Web_Server_Client>java InitializeServer
[ SERVER ]> Server starts at Port Number : 8080
[ SERVER ]> SERVER started at host: localhost/127.0.0.1 and port number: 8080

[ SERVER - CLIENT0 ]> Connection successfully established with the client at /127.0.0.1:63075
[ SERVER - CLIENT0 ]> Request received: GET / HTTP/1.0
[ SERVER - CLIENT0 ]> Requested filePath: /
[ SERVER - CLIENT0 ]> Default /index.html file as response
[ SERVER - CLIENT0 ]> Sending Response with status line: HTTP/1.0 200 OK

[ SERVER - CLIENT0 ]> HTTP Response sent
[ SERVER - CLIENT0 ]> Closing the connection.
```

Output on the browser window



Output on client side for a file (/hey.html) not existing on the server

```

C:\Windows\System32\cmd.exe
</html>
[ CLIENT ]> HTTP Response received. File Created: CSE 5344 - Project 1.html
[ CLIENT ]> Connection closed successfully!.

G:\UTA_MS_1st_Sem\5344\Projects\Project_1\Multi_Threaded_Web_Server_Client> java WebClient localhost /hey.html
[ CLIENT ]> Integer Port is not provided! Default Server port used.
[ CLIENT ]> Server Port in use: 8080
[ CLIENT ]> FilePath: /hey.html
[ CLIENT ]> Server connected at localhost:8080
[ CLIENT ]> Sending HTTP GET request: GET /hey.html HTTP/1.0

[ CLIENT ]> Server response awaited
[ CLIENT ]> Received HTTP Response with status line: HTTP/1.0 404 Not Found
[ CLIENT ]> Received Content-type: text/html
[ CLIENT ]> Response Body Received:
<!doctype html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Error 404</title>
</head>
<body>
  <b>ErrorCode:</b> 404
  <br>
  <b>Error Message:</b> The requested file does not exist on this server.
</body>
</html>
[ CLIENT ]> HTTP Response received. File Created: Error 404.html
[ CLIENT ]> Connection closed successfully!.

G:\UTA_MS_1st_Sem\5344\Projects\Project_1\Multi_Threaded_Web_Server_Client>

```

Output on server side for a file (/hey.html) not existing on the server

```

C:\Windows\System32\cmd.exe - java InitializeServer
[ SERVER - CLIENT2 ]> Request received: GET /favicon.ico HTTP/1.1
[ SERVER - CLIENT2 ]> Requested filePath: /favicon.ico
[ SERVER - CLIENT2 ]> ERROR caught: Requested filePath ./favicon.ico does not exist
[ SERVER - CLIENT2 ]> Sending Response with status line: HTTP/1.0 404 Not Found

[ SERVER - CLIENT2 ]> HTTP Response sent
[ SERVER - CLIENT2 ]> Closing the connection.

[ SERVER - CLIENT3 ]> Request received: GET /index.html HTTP/1.1
[ SERVER - CLIENT3 ]> Requested filePath: /index.html
[ SERVER - CLIENT3 ]> Sending Response with status line: HTTP/1.0 200 OK

[ SERVER - CLIENT3 ]> HTTP Response sent
[ SERVER - CLIENT3 ]> Closing the connection.

[ SERVER - CLIENT4 ]> Connection successfully established with the client at /127.0.0.1:63128
[ SERVER - CLIENT5 ]> Connection successfully established with the client at /127.0.0.1:63132
[ SERVER - CLIENT5 ]> Request received: GET /hey.html HTTP/1.0
[ SERVER - CLIENT5 ]> Requested filePath: /hey.html
[ SERVER - CLIENT5 ]> ERROR caught: Requested filePath ./hey.html does not exist
[ SERVER - CLIENT5 ]> Sending Response with status line: HTTP/1.0 404 Not Found

[ SERVER - CLIENT5 ]> HTTP Response sent
[ SERVER - CLIENT5 ]> Closing the connection.

[ SERVER - CLIENT4 ]> Discarding a NULL/unknown HTTP request.
[ SERVER - CLIENT4 ]> Closing the connection.

```

Stop the Tomcat Server

C:\Users\ishit\Downloads\apache-tomcat-7.0.96\bin&gt;shutdown.bat