COMS/SE 319: Software Construction and User Interface
Fall 2018

LAB Activity 2 – SERVER/CLIENT

Task 1: Play with Simple Server/Client

Learning Objectives:

Students will:

- learn how to write server side code
- learn how to write client side code
- learn how to run server and client codes
- know about socket and port# and IP
- know about typical errors

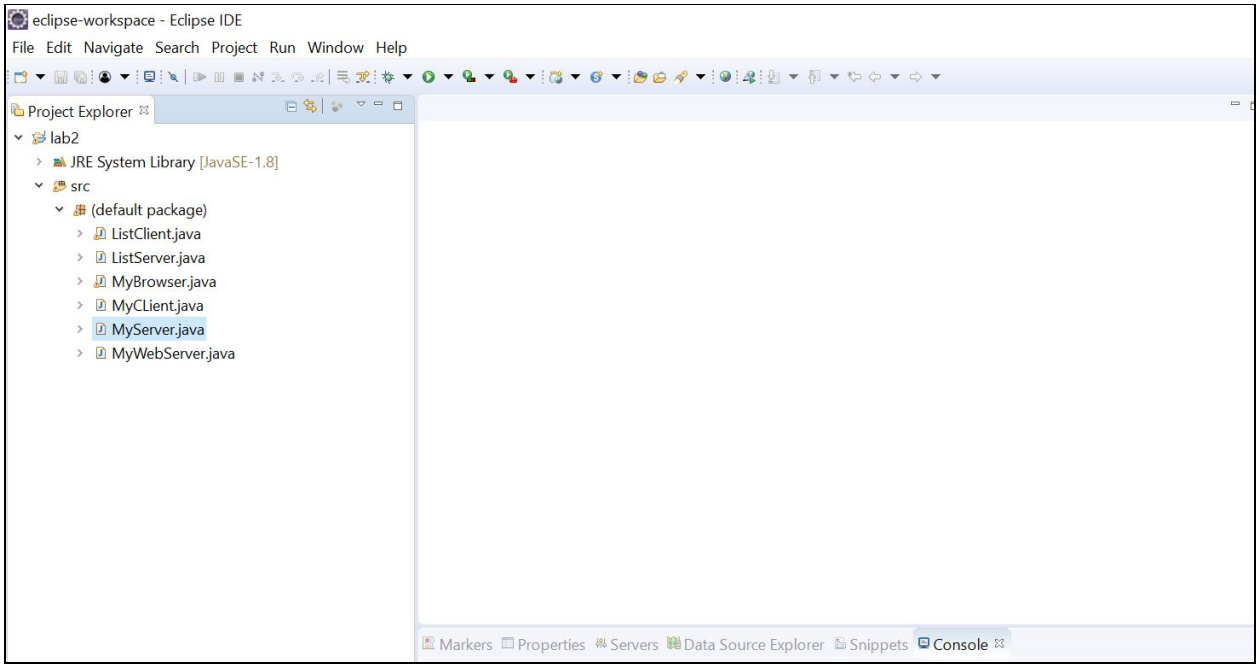
Resource:

All the links shown in the snapshot below have a wealth of information. Please read first.

https://docs.oracle.com/javase/tutorial/networking/sockets/index.html

- **Step 1:**

  Download and unzip **Lab2ServerClientExamples.zip,** Create a java project in Eclipse (File>New>Project>Java Project>Provide Name and click Finish) and then expand the newly created project and select "src" and paste all source codes in that like below.

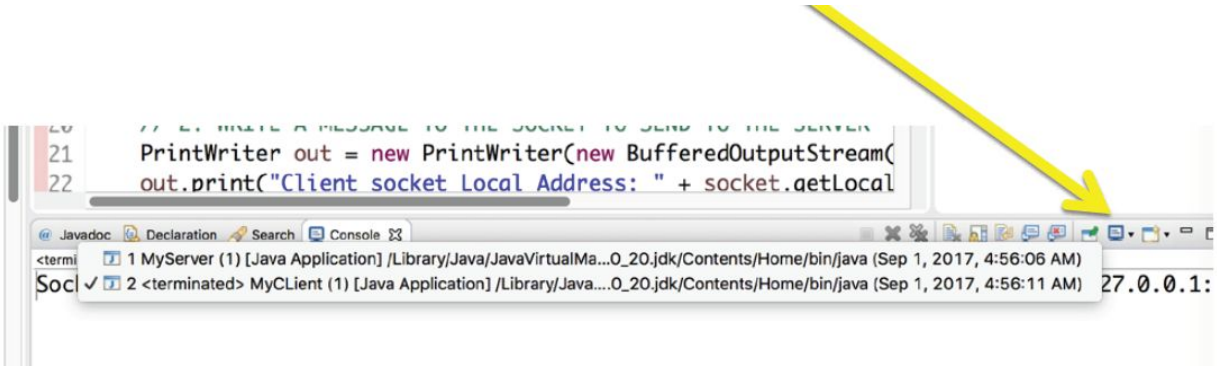


- READ MyServer.java
- **What is the port number for the service provided by this server? [Please answer it in Canvas Quiz]**
- Does the server send any data to the client via the socket?
- Why is the server in a "forever" loop?

- **Step 2:**
  - Run MyServer.java (do not kill it)
  - Run MyServer.java again!
  - What message do you get on console? Do you understand what is happening here?

- **Step 3:**
  - Read MyClient.java
  - Does the Client read any data from the server?
  - Does the Client send any data to the server?
  - What is the complete address of the server program that the client program connects to? (You need an IP address AND a port#).

- **Step 4::**
  - Run MyClient.java
  - Make sure to switch and take a look at both client and server consoles.



- What is the CLIENT port number that the server connects to?

- **Step 5:**
  - Run MyClient.java again
  - Run MyClient.java again!
  - Run MyClient.java again!
- **Step 6:**
  - On Comment out line 24 (i.e. out.flush()) of MyClient.java code.
  - Run MyServer.java again!
  - Run MyClient.java again.
  - What message do you get on the server console?
  - Note: you may be getting an error anyway. Add out.close() to get rid of error after line 24.
  - Explain the reason for the error.

Task 2: Play with Server/Client

Learning Objectives:

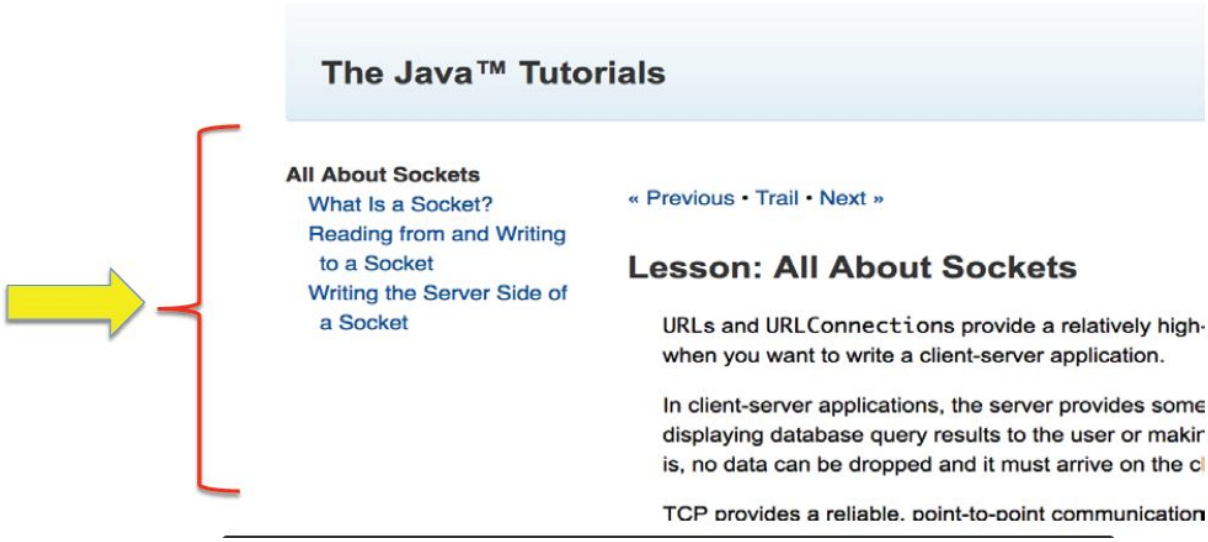
Students will:

- learn how servers and clients can "talk" to each other. i.e. both must agree on a "protocol"

Resource:

All the links shown in the snapshot below have a wealth of information. Please read first.

https://docs.oracle.com/javase/tutorial/networking/sockets/index.html



- **Step 1:**
  - READ ListServer.java
  - Does the server send any data to clients?
  - **Does the server get any data from clients? [Please answer it in Canvas Quiz]**

- **Step 2:**
  - Read ListClient.java
  - Why does the client start a thread?
  - In which thread does the client write to the server?
  - When will the client exit?

- **Step 3:**
  - Run ListServer.java
  - Run ListClient.java one or more times.
  - Check the results of server and clients (by switching console window).
  - Describe sequence of read/writes between server/client.

- **Protocol:**
  - Protocol is an understanding between server and client on how they will communicate.

- In this example, the server expects three messages from the client and then sends a message to the client. Similarly, the client has expectations from the client too!

Task 3: PLAY WITH WEBSERVER/ WEBCLIENT

Learning Objectives:

Students will:

- learn a bit about the protocol followed by WEB-servers and WEBclients. This protocol is known as the HTTP protocol.

- **Step 1:**
  - READ MyWebServer.java
  - Note: normal web servers use port#80. However, our WebServer uses port#4444
  - What is sequence of messages the server is sending to client on receiving a GET message?
- **Step 2:**
  - Read MyBrowser.java
  - What is the browser sending to the server?

- **Step 3:**
  - Run MyWebServer.java
  - Run MyBrowser.java
  - It will open up a display window. Also, on the console, you will need to enter the hostname and then when prompted, enter the port number (4444)
  - **Take a look at what is displayed on the MyBrowser window? [Please answer it in Canvas Quiz]**

- **Step 4:**
  - Run MyBrowser.java again
  - This time, use hostname www.google.com and port number 80
  - Describe what is displayed on the MyBrowser window?