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Software Engineering, Section 01
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Assignment #1, Socket Programming
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1 Project Description

This project includes two parts, the client and the server, which are both sockets.

The client can automatically connect to the server, and then start to download a file that server sends. After connect the stopwatch of the client will start, and after the downloading, the stopwatch will stop. The flag of stop is a “shut down” received. Then the cost of time of communication is calculated and showed.

The server will send to the client a designated file to the client using BufferedWriter. It will first sends the name of the file to the client, and then the data to it. After all data are transmitted, the server will send “shut down” to the client, ending the downloading process.

2 Precise Time Calculation

In order to get a relative precise time of communication between machines, the file of downloading is relatively large. So in this way, even though there are other factors that may influence the result, compared to the downloading process, it is relatively small. It is a txt file of the novel David Copperfield, and in the txt, this novel is copied many times with a size of 65195 KB.

3 Testing Environment

Machine #	Description	Type of Hard Disk	Connection Type	Java Version
#1	Laptop	SSD (Samsung, 128GB)	Wifi (RUWireless Secure)	1.8
#2	Kilmer Library Computer	SSD (Sandisk, 256GB)	LAN	1.7
#3	iLab (kill.cs.rutgers.edu)	Unknown	LAN	1.7

4 Test Details

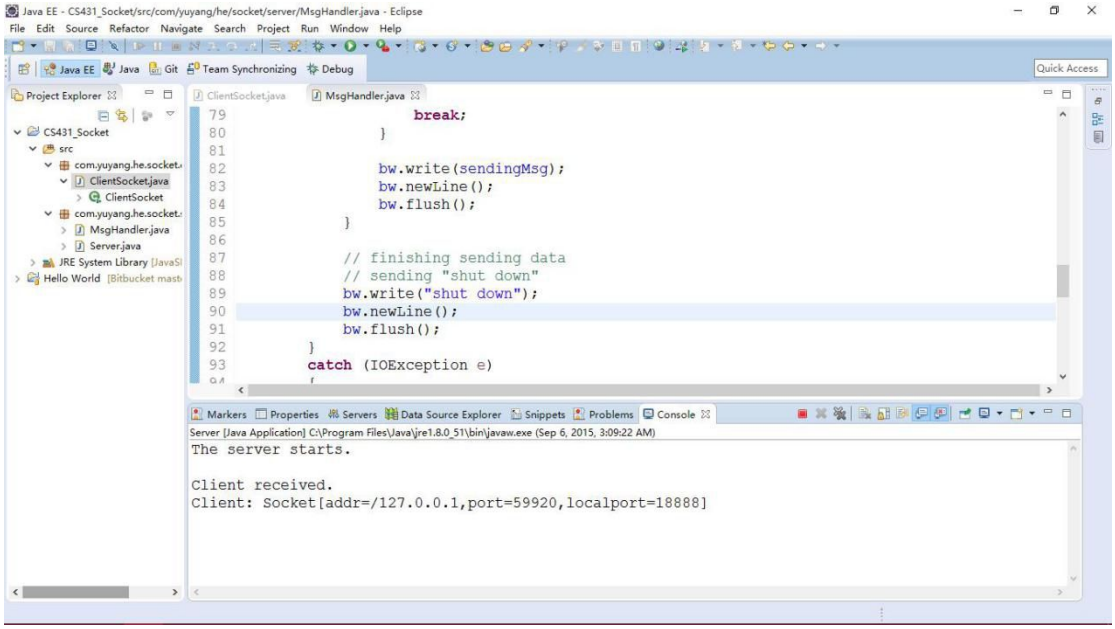
A) Test Results

Test Number	Client Machine	Server Machine	Download Time (ms)
#1	Laptop	Laptop	1757
#2	Laptop	iLab	21581
#3	iLab	Laptop	33354
#4	iLab	iLab	1489
#5	Library Computer	Library Computer	6021
#6	Library Computer	iLab	9113
#7	Library Computer	Laptop	27247

B) Test Screenshot

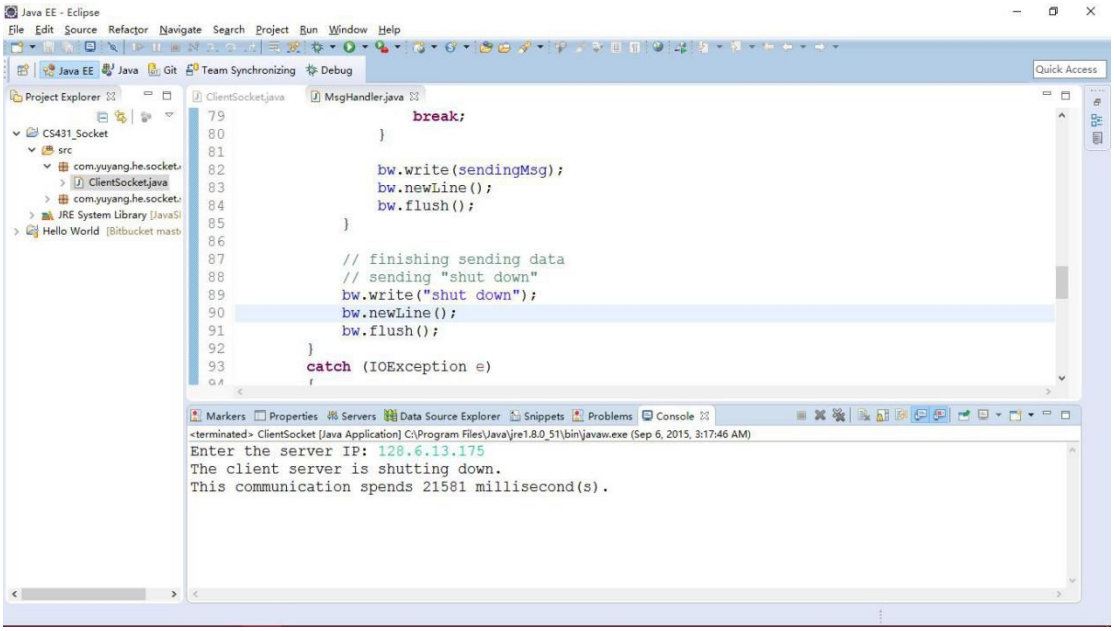
Client screenshot will be shown below.

Server screenshot:

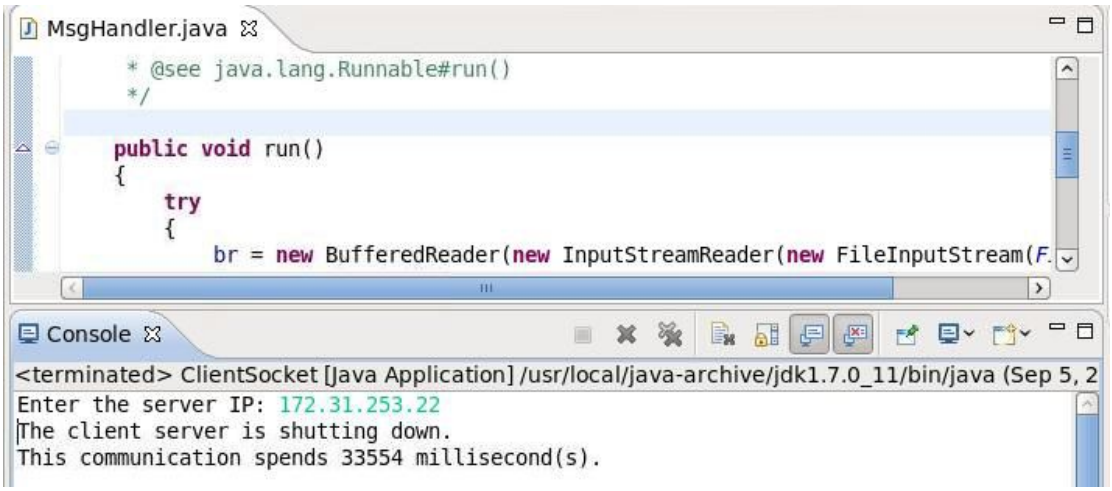


1) Test #1

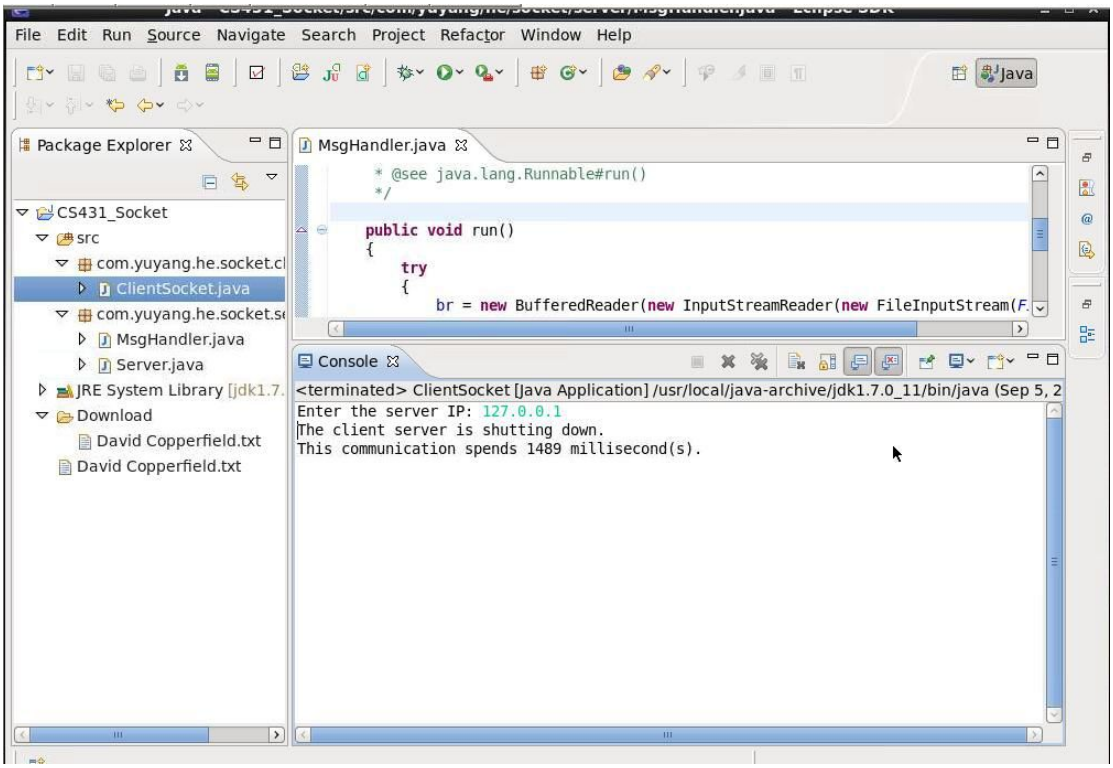
2) Test #2



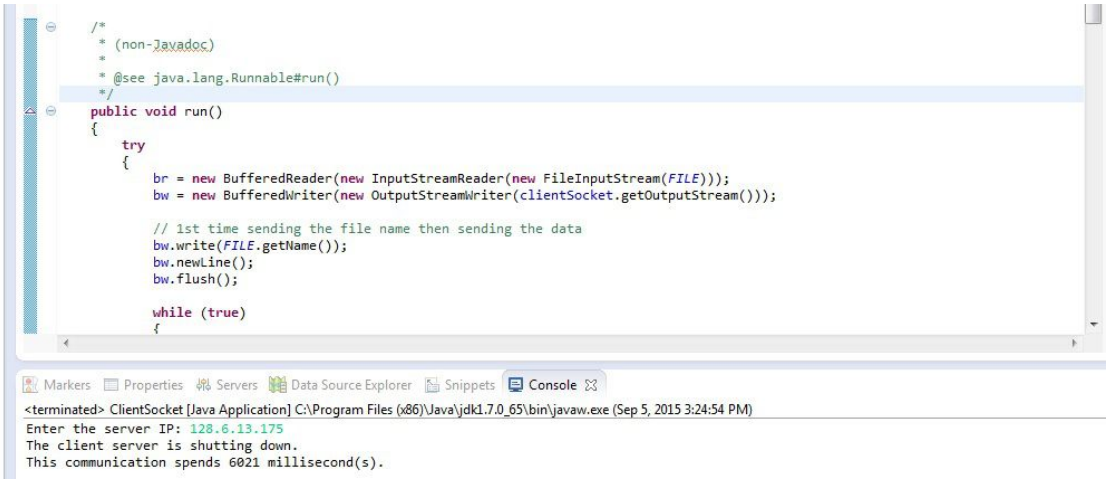
3) Test #3



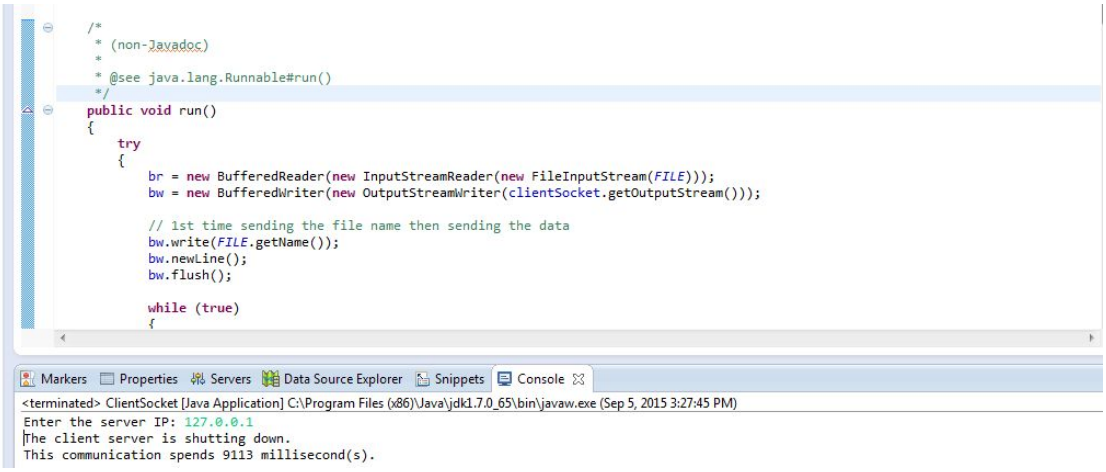
4) Test #4



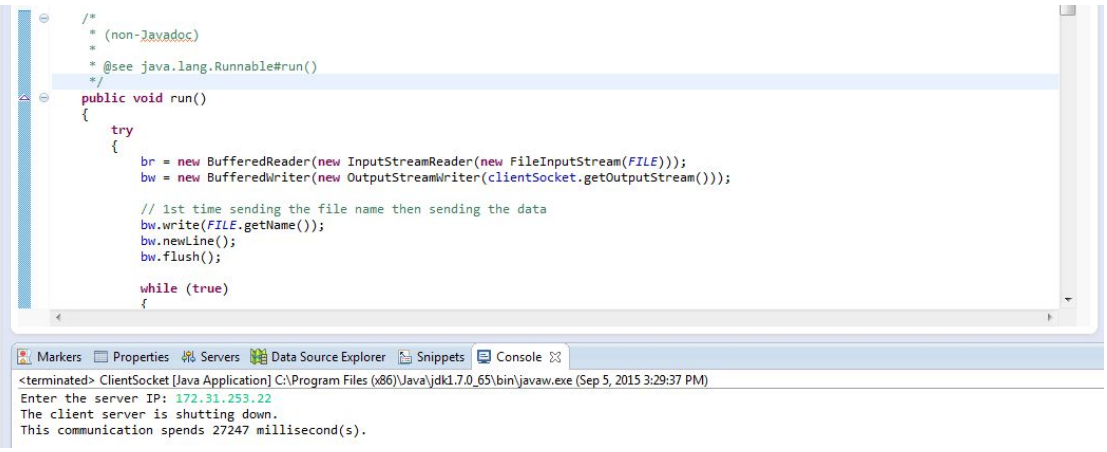
5) Test #5



6) Test #6



7) Test #7



C) Test Conclusion

Test Number	Client Machine	Server Machine	Download Time (ms)
#1	Laptop	Laptop	1757
#2	Laptop	iLab	21581
#3	iLab	Laptop	33354
#4	iLab	iLab	1489
#5	Library Computer	Library Computer	6021
#6	Library Computer	iLab	9113
#7	Library Computer	Laptop	27247

Based on the results, it clearly shows that communication inside the machine is much faster than communication between different machines (test #1, #4, and #5). The is possibly because the speed of the communication inside of the machine is limited by buses, RAM, and the speed of the hard disk, where communication on the library computer is slower than on the laptop and iLab.

Communication between machines is slower because the speed of buses, RAM and the speed of the hard disk is relatively so fast that the limit of it is the speed of the

network. Compared test #2, #3 and #7 with #6, the speed of using cable may be faster than using wifi. But this cannot be so sure because maybe iLab and library machine are in the LAN while RUWireless, the wifi, is an independent network which may takes more time.

Also Java version may have influence on it but I use a relatively big file to minimize the side-effects.