

Interoperability Test

Name: 여주안

Student ID number: 2017027265

Write down information of your team mates.

Name	Student ID number
여주안	2017027265
A	-
B	-
C	-

1. Introduction

4명의 조원들이 함께 웹 서버와 웹 클라이언트 프로그램을 테스트하였다. 상호운용성 테스트는 다른 기기에 있는 웹 서버/웹 클라이언트를 연결하는 실험이다. 웹 클라이언트는 GET, POST 방식으로 HTTP 요청을 보내고 서버는 이를 처리하여 올바른 응답을 반환한다. 네트워크 통신의 내용은 Wireshark로 캡쳐하여 확인한다.

2. Test Procedure 1

A. Write down the name of person that you tested with

Web server owner's name	B
Web client owner's name	여주안

B. Run wireshark

C. Send GET Method to Web Server of your group member through your client

i. Get studentID.html

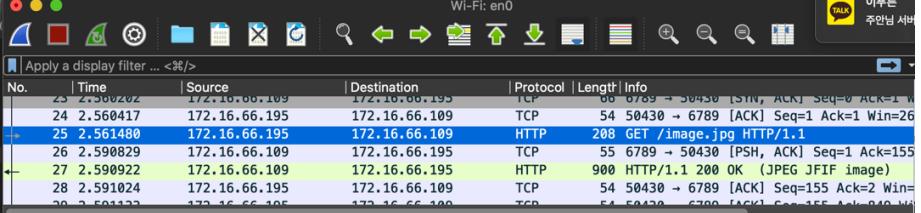
(e.g. GET <http://127.0.0.1:8080/studentId.html>)

Result Screenshot (Client)	
Result Screenshot (Server)	<pre>Received HTTP request: GET /2018028013.html HTTP/1.1 file name: /2018028013.html User-Agent: 2017022765/JUANEYO/WEBCLIENT/COMPUTERNETWORK Accept: text/html Host: 172.16.66.109:6789 Connection: keep-alive Statusline : HTTP/1.1 200 OK entityBody : <HTML> <HEAD><TITLE>?</TITLE></HEAD> <BODY>?</BODY> code OK type : text/html sending request file to Client...</pre>
Wireshark Screenshot	<p>Frame 54: 86 bytes on wire (688 bits), 86 bytes captured (688 bits) on interface en0, id 0 Ethernet II, Src: IntelCor_23:b5:7c (0c:7a:15:23:b5:7c), Dst: Apple_bd:b5:ce (90:9c:4a:bd:b5:ce) Internet Protocol Version 4, Src: 172.16.66.109, Dst: 172.16.66.195 Transmission Control Protocol, Src Port: 6789, Dst Port: 50416, Seq: 65, Ack: 161, Len: 32 [3 Resassembled TCP Segments (96 bytes): #49(1), #52(63), #54(32)] Hypertext Transfer Protocol Line-based text data: text/html (1 lines)</p>

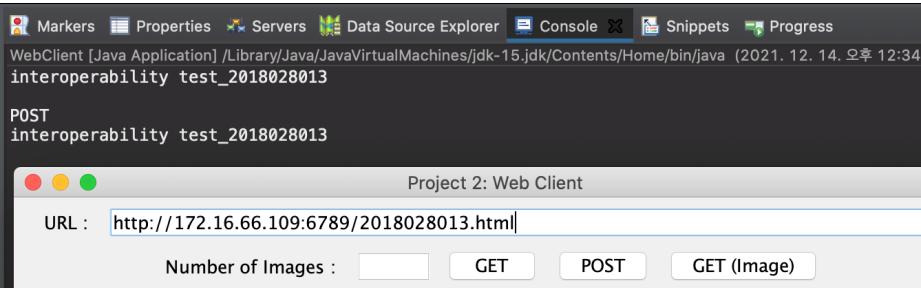
ii. Get image.jpg

(e.g. GET http://127.0.0.1:8080/image.jpg)

Result Screenshot (Client)	
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Result Screenshot (Server)	<pre>Console ✘ WebServer_Bank [Java Application] C:\Users\leepureun\p2\pool\plugins\org.eclipse.jst.java.core\hotspot\jre\full\win32\x86_64_15.0.2.v202102 Pragma: no-cache Host: 172.16.66.109:6789 Connection: keep-alive Content-Length: 11 StatusLine : HTTP/1.1 200 OK entityBody : <HTML> <HEAD><TITLE>?</TITLE></HEAD> <BODY>?</BODY> code OK type : text/html sending request file to Client... Received HTTP request: GET /image.jpg HTTP/1.1 file name: /image.jpg User-Agent: 2017027265\JUANYEO\WEBCCLIENT\COMPUTERNETWORK Accept: text/html Host: 172.16.66.109:6789 Connection: keep-alive StatusLine : HTTP/1.1 200 OK entityBody : <HTML> <HEAD><TITLE>?</TITLE></HEAD> <BODY>? code OK type : image/jpeg sending request file to Client...</pre>																																																								
Wireshark Screenshot	 <p>Wi-Fi: en0</p> <p>Apply a display filter ... <#></p> <table border="1"> <thead> <tr> <th>No.</th> <th>Time</th> <th>Source</th> <th>Destination</th> <th>Protocol</th> <th>Length</th> <th>Info</th> </tr> </thead> <tbody> <tr> <td>23</td> <td>2.560417</td> <td>172.16.66.195</td> <td>172.16.66.109</td> <td>TCP</td> <td>54</td> <td>50430 → 6789 [ACK] Seq=1 Ack=1 Win=26</td> </tr> <tr> <td>24</td> <td>2.560417</td> <td>172.16.66.195</td> <td>172.16.66.109</td> <td>TCP</td> <td>54</td> <td>50430 → 6789 [ACK] Seq=1 Ack=1 Win=26</td> </tr> <tr> <td>25</td> <td>2.561480</td> <td>172.16.66.195</td> <td>172.16.66.109</td> <td>HTTP</td> <td>208</td> <td>GET /image.jpg HTTP/1.1</td> </tr> <tr> <td>26</td> <td>2.590829</td> <td>172.16.66.109</td> <td>172.16.66.195</td> <td>TCP</td> <td>55</td> <td>6789 → 50430 [PSH, ACK] Seq=1 Ack=155</td> </tr> <tr> <td>27</td> <td>2.590922</td> <td>172.16.66.109</td> <td>172.16.66.195</td> <td>HTTP</td> <td>900</td> <td>HTTP/1.1 200 OK (JPEG JFIF image)</td> </tr> <tr> <td>28</td> <td>2.591024</td> <td>172.16.66.195</td> <td>172.16.66.109</td> <td>TCP</td> <td>54</td> <td>50430 → 6789 [ACK] Seq=155 Ack=2 Win=26</td> </tr> <tr> <td>29</td> <td>2.591122</td> <td>172.16.66.109</td> <td>172.16.66.109</td> <td>TCP</td> <td>54</td> <td>50430 → 6789 [ACK] Seq=155 Ack=260 Win=26</td> </tr> </tbody> </table> <p>Frame 25: 208 bytes on wire (1664 bits), 208 bytes captured (1664 bits) on interface en0, id 0</p> <p>Ethernet II, Src: Apple_bluetooth (90:9c:4a:b5:b5:ce) (0c:7a:15:23:b5:7c), Dst: IntelCor_23:b5:7c (0c:7a:15:23:b5:7c)</p> <p>Internet Protocol Version 4, Src: 172.16.66.195, Dst: 172.16.66.109</p> <p> 0100 = Version: 4</p> <p> 0101 = Header Length: 20 bytes (5)</p> <p> ▶ Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)</p> <p> Total Length: 194</p>	No.	Time	Source	Destination	Protocol	Length	Info	23	2.560417	172.16.66.195	172.16.66.109	TCP	54	50430 → 6789 [ACK] Seq=1 Ack=1 Win=26	24	2.560417	172.16.66.195	172.16.66.109	TCP	54	50430 → 6789 [ACK] Seq=1 Ack=1 Win=26	25	2.561480	172.16.66.195	172.16.66.109	HTTP	208	GET /image.jpg HTTP/1.1	26	2.590829	172.16.66.109	172.16.66.195	TCP	55	6789 → 50430 [PSH, ACK] Seq=1 Ack=155	27	2.590922	172.16.66.109	172.16.66.195	HTTP	900	HTTP/1.1 200 OK (JPEG JFIF image)	28	2.591024	172.16.66.195	172.16.66.109	TCP	54	50430 → 6789 [ACK] Seq=155 Ack=2 Win=26	29	2.591122	172.16.66.109	172.16.66.109	TCP	54	50430 → 6789 [ACK] Seq=155 Ack=260 Win=26
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23	2.560417	172.16.66.195	172.16.66.109	TCP	54	50430 → 6789 [ACK] Seq=1 Ack=1 Win=26																																																			
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D. Send POST Method to Web Server of group member through your client
(e.g. POST http://127.0.0.1:8080/studentId.html)

Result Screenshot (Client)	 <p>Markers Properties Servers Data Source Explorer Console Snippets Progress</p> <p>WebClient [Java Application] /Library/Java/JavaVirtualMachines/jdk-15.jdk/Contents/Home/bin/java (2021. 12. 14. 오후 12:34)</p> <p>interoperability test_2018028013</p> <p>POST interoperability test_2018028013</p> <p>Project 2: Web Client</p> <p>URL : http://172.16.66.109:6789/2018028013.html </p> <p>Number of Images : <input type="text"/> GET POST GET (Image)</p>
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Result Screenshot (Server)	<pre>Console >>> WebServer_Bank [Java Application] C:\Users\leepureun\P2\pool\plugins\org.eclipse.jdt.openjdk.hotspot.jre.full.win32.x86_64_15.0.2.v20210201-0955\jre\bin\javaw.exe (2021. Connection : HTTP/1.1 200 OK entityBody : <HTML> <HEAD><TITLE></TITLE></HEAD> <BODY></BODY> code OK type : text/html sending request file to Client... Received HTTP request: POST /2018028013.html HTTP/1.1 file name: /2018028013.html Content-Type: text/xml;charset=UTF-8 User-Agent: 2017027265/JUANYEO/WEBCLIENT/COMPUTERNETWORK Accept: text/xml Cache-Control: no-cache Pragma: no-cache Host: 172.16.66.109:6789 Connection: keep-alive Content-Length: 11 StatusLine : HTTP/1.1 200 OK entityBody : <HTML> <HEAD><TITLE></TITLE></HEAD> <BODY></BODY> code OK type : text/html sending request file to Client...</pre>																																																								
Wireshark Screenshot	<table border="1"> <thead> <tr> <th>No.</th> <th>Time</th> <th>Source</th> <th>Destination</th> <th>Protocol</th> <th>Length</th> <th>Info</th> </tr> </thead> <tbody> <tr> <td>13</td> <td>1.887840</td> <td>172.16.66.109</td> <td>172.16.66.195</td> <td>TCP</td> <td>75</td> <td>6789 → 50419 [PSH, ACK] Seq=44 Ack=27</td> </tr> <tr> <td>14</td> <td>1.887888</td> <td>172.16.66.195</td> <td>172.16.66.109</td> <td>TCP</td> <td>54</td> <td>50419 → 6789 [ACK] Seq=273 Ack=65 Win</td> </tr> <tr> <td>15</td> <td>1.888927</td> <td>172.16.66.109</td> <td>172.16.66.195</td> <td>HTTP</td> <td>86</td> <td>HTTP/1.1 200 OK (text/html)</td> </tr> <tr> <td>16</td> <td>1.888974</td> <td>172.16.66.195</td> <td>172.16.66.109</td> <td>TCP</td> <td>54</td> <td>50419 → 6789 [ACK] Seq=273 Ack=98 Win</td> </tr> <tr> <td>17</td> <td>2.001106</td> <td>172.16.66.195</td> <td>172.16.66.255</td> <td>UDP</td> <td>305</td> <td>54915 → 54915 Len=263</td> </tr> <tr> <td>18</td> <td>2.889787</td> <td>IETF-VRRP-VRID_c9</td> <td>Apple_bd:b5:ce</td> <td>ARP</td> <td>60</td> <td>172.16.66.254 is at 00:00:5e:00:01:c9</td> </tr> <tr> <td>19</td> <td>2.904099</td> <td>172.16.66.109</td> <td>172.16.66.255</td> <td>UDP</td> <td>205</td> <td>54915 → 54915 Len=263</td> </tr> </tbody> </table> <p>Frame 15: 86 bytes on wire (688 bits), 86 bytes captured (688 bits) on interface en0, id 0 ▶ Ethernet II, Src: IntelCor_23:b5:7c (0c:7a:15:23:b5:7c), Dst: Apple_bd:b5:ce (90:9c:4a:bd:b5:ce) ▶ Internet Protocol Version 4, Src: 172.16.66.109, Dst: 172.16.66.195 0100 = Version: 4 0101 = Header Length: 20 bytes (5) ▶ Differentiated Services Field: 0x00 (DSSCP: CS0, ECN: Not-ECT)</p>	No.	Time	Source	Destination	Protocol	Length	Info	13	1.887840	172.16.66.109	172.16.66.195	TCP	75	6789 → 50419 [PSH, ACK] Seq=44 Ack=27	14	1.887888	172.16.66.195	172.16.66.109	TCP	54	50419 → 6789 [ACK] Seq=273 Ack=65 Win	15	1.888927	172.16.66.109	172.16.66.195	HTTP	86	HTTP/1.1 200 OK (text/html)	16	1.888974	172.16.66.195	172.16.66.109	TCP	54	50419 → 6789 [ACK] Seq=273 Ack=98 Win	17	2.001106	172.16.66.195	172.16.66.255	UDP	305	54915 → 54915 Len=263	18	2.889787	IETF-VRRP-VRID_c9	Apple_bd:b5:ce	ARP	60	172.16.66.254 is at 00:00:5e:00:01:c9	19	2.904099	172.16.66.109	172.16.66.255	UDP	205	54915 → 54915 Len=263
No.	Time	Source	Destination	Protocol	Length	Info																																																			
13	1.887840	172.16.66.109	172.16.66.195	TCP	75	6789 → 50419 [PSH, ACK] Seq=44 Ack=27																																																			
14	1.887888	172.16.66.195	172.16.66.109	TCP	54	50419 → 6789 [ACK] Seq=273 Ack=65 Win																																																			
15	1.888927	172.16.66.109	172.16.66.195	HTTP	86	HTTP/1.1 200 OK (text/html)																																																			
16	1.888974	172.16.66.195	172.16.66.109	TCP	54	50419 → 6789 [ACK] Seq=273 Ack=98 Win																																																			
17	2.001106	172.16.66.195	172.16.66.255	UDP	305	54915 → 54915 Len=263																																																			
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19	2.904099	172.16.66.109	172.16.66.255	UDP	205	54915 → 54915 Len=263																																																			

3. Test Procedure

- A. Write down the name of person that you tested with

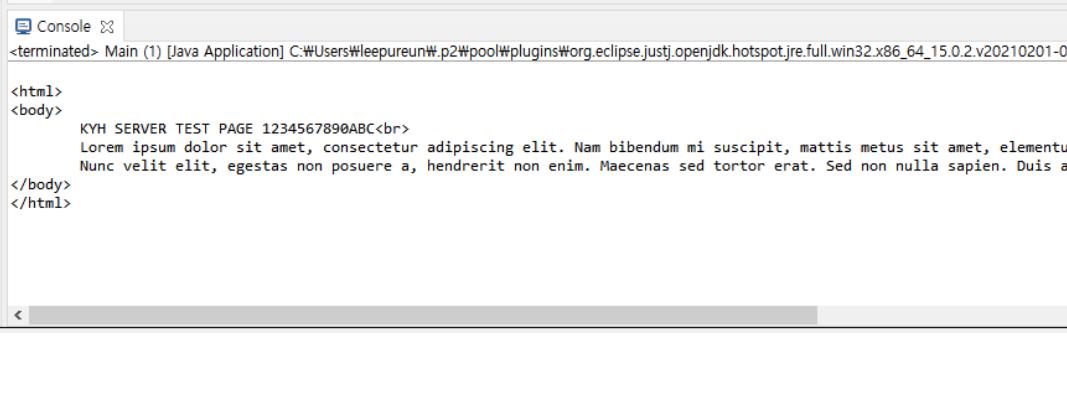
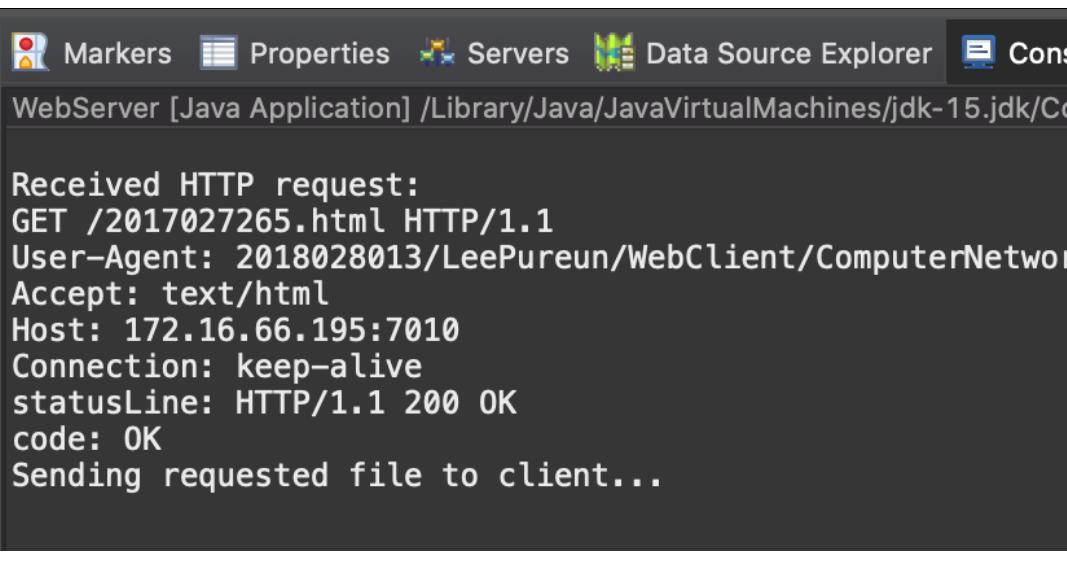
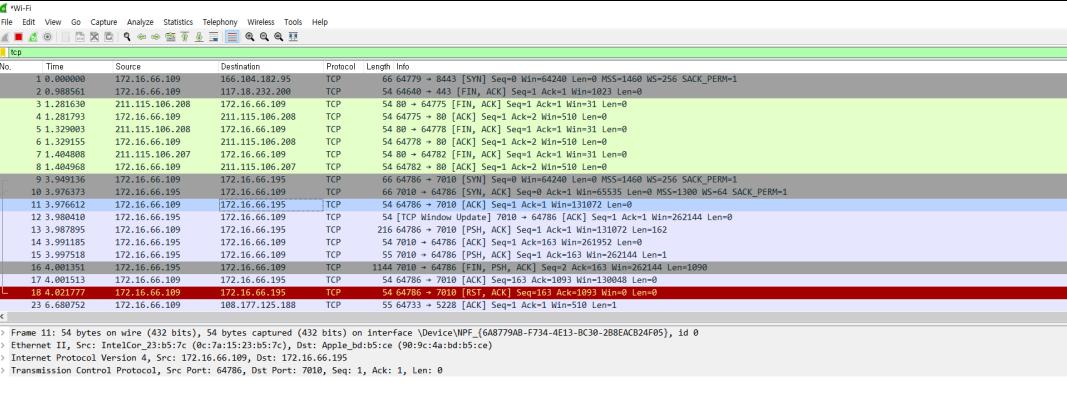
Web server owner's name	여주안
Web client owner's name	B

- B. Run wireshark

- C. Send GET Method to Web Server of your group member through your client

- i. Get studentID.html

GET <http://172.16.66.195:7010/2017027265.html>

Result	
Scree	
nshot	

ii. Get image.jpg

(e.g. GET <http://127.0.0.1:8080/image.jpg>)

GET <http://172.16.66.195:7010/image.jpg>

Result Screenshot (Client)	
Result Screenshot (Server)	
Wireshark Screenshot	

Wi-Fi							
No.	Time	Source	Destination	Protocol	Length	Info	
629	295.668522	172.16.66.109	211.249.201.68	TCP	54	64804 → 443 [FIN, ACK] Seq=881 Ack=30175 Win=131072 Len=0	
630	295.671656	211.249.201.68	172.16.66.109	TCP	54	443 → 64804 [FIN, ACK] Seq=30175 Ack=882 Win=31744 Len=0	
631	295.671729	172.16.66.109	211.249.201.68	TCP	54	64804 → 443 [ACK] Seq=882 Ack=30176 Win=131072 Len=0	
634	296.091149	172.16.66.109	172.16.66.195	TCP	66	64805 → 7010 [SYN] Seq=0 Win=64240 Len=0 MSS=1468 WS=256 SACK_PERM=1	
635	296.118074	172.16.66.109	172.16.66.195	TCP	66	7010 → 64805 [SYN, ACK] Seq=0 Ack=1 Win=65353 Len=0 MSS=1300 WS=64 SACK_PERM=1	
636	296.118174	172.16.66.109	172.16.66.195	TCP	54	64805 → 7010 [ACK] Seq=1 Ack=1 Win=131072 Len=0	
637	296.123391	172.16.66.109	172.16.66.195	TCP	54	[TCP Retransmission] 64806 → 7010 [ACK] Seq=1 Ack=1 Win=262144 Len=0	
638	296.123391	172.16.66.109	172.16.66.195	TCP	210	7010 → 64806 [PSH, ACK] Seq=1 Ack=1 Win=131072 Len=156	
639	296.126570	172.16.66.109	172.16.66.195	TCP	54	7010 → 64806 [PSH, ACK] Seq=1 Ack=157 Win=261952 Len=0	
640	296.127843	172.16.66.109	172.16.66.195	TCP	55	7010 → 64806 [PSH, ACK] Seq=1 Ack=157 Win=262144 Len=1	
641	296.130774	172.16.66.109	172.16.66.195	TCP	133	7010 → 64806 [FIN, PSH, ACK] Seq=2 Ack=157 Win=262144 Len=1279	
642	296.130897	172.16.66.109	172.16.66.195	TCP	54	64805 → 7010 [ACK] Seq=157 Ack=1282 Win=129792 Len=0	
643	296.149787	172.16.66.109	172.16.66.195	TCP	54	64805 → 7010 [RST, ACK] Seq=157 Ack=1282 Win=0 Len=0	
>	Frame 643: 54 bytes on wire (432 bits), 54 bytes captured (432 bits) on interface \Device\WPF_{6A8779A8-E734-AE13-BC30-2B8EAC824F05}, id 0						
>	Ethernet II, Src: IntelCor_23:b5:7c (0c:7a:15:23:b5:7c), Dst: Apple_bluetooth (90:9c:4a:b0:b5:c0)						
>	Internet Protocol Version 4, Src: 172.16.66.109, Dst: 172.16.66.195						
>	Transmission Control Protocol, Src Port: 64805, Dst Port: 7010, Seq: 157, Ack: 1282, Len: 0						

D. Send POST Method to Web Server of group member through your client

(e.g. POST <http://127.0.0.1:8080/studentId.html>)

Result	<pre>Console <terminated> Main (1) [Java Application] C:\Users\leepureun\p2\pool\plugins\org.eclipse.justmyjre.full.win32.x86_64_15.0.2.v20210201-0955\jre\bin\javaw. <html> <body> KYH SERVER TEST PAGE 1234567890ABC
 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nam bibendum mi suscipit, mattis metus sit amet, elementum enim. Nulla qu Nunc velit elit, egestas non posuere a, hendrerit non enim. Maecenas sed tortor erat. Sed non nulla sapien. Duis accumsan, nisi se </body> </html></pre>
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Result Scree nshot (Serve r)	<p>Markers Properties Servers Data Source Explorer Console</p> <pre>WebServer [Java Application] /Library/Java/JavaVirtualMachines/jdk-15.jdk/Contents/H code: OK Sending requested file to client... Received HTTP request: POST /2017027265.html HTTP/1.1 Content-Type: text/xml;charset=UTF-8 User-Agent: 2018028013/LeePureun/WebClient/ComputerNetwork Accept: text/xml Cache-Control: no-cache Pragma: no-cache Host: 172.16.66.195:7010 Connection: keep-alive Content-Length: 13 statusLine: HTTP/1.1 200 OK code: OK Sending requested file to client...</pre>																																																																																																																			
Wires hark Scree nshot	<p>Wi-Fi File Edit View Go Capture Analyze Statistics Telephone Wireless Tools Help</p> <p>No. Time Source Destination Protocol Length Info</p> <table border="1"> <thead> <tr> <th>No.</th> <th>Time</th> <th>Source</th> <th>Destination</th> <th>Protocol</th> <th>Length</th> <th>Info</th> </tr> </thead> <tbody> <tr><td>668 333.189581</td><td>20.198.162.78</td><td>172.16.66.199</td><td>TLSv1.2</td><td>228</td><td>Application Data</td></tr> <tr><td>669 333.244083</td><td>20.198.162.78</td><td>172.16.66.199</td><td>TCP</td><td>54</td><td>64528 + 443 [ACK] Seq=345 Ack=1393 Win=510 Len=0</td></tr> <tr><td>675 342.194206</td><td>172.16.66.199</td><td>172.16.66.195</td><td>TCP</td><td>66</td><td>64807 → 7010 [SYN] Seq=0 Win=64240 Len=0 MSS=1468 WS=256 SACK_PERM=1</td></tr> <tr><td>676 342.199153</td><td>172.16.66.199</td><td>172.16.66.195</td><td>TCP</td><td>66</td><td>7010 → 64807 [SYN, ACK] Seq=0 Ack<1 Win=65535 Len=0 MSS=1380 WS=64 SACK_PERM=1</td></tr> <tr><td>677 342.199234</td><td>172.16.66.199</td><td>172.16.66.195</td><td>TCP</td><td>54</td><td>64807 → 7018 [ACK] Seq=1 Ack<1 Win=131072 Len=0</td></tr> <tr><td>678 342.202809</td><td>172.16.66.195</td><td>172.16.66.195</td><td>TCP</td><td>54</td><td>[TCP Window Update] 7018 → 64807 [ACK] Seq=1 Ack=1 Win=262144 Len=0</td></tr> <tr><td>679 342.210690</td><td>172.16.66.199</td><td>172.16.66.195</td><td>TCP</td><td>317</td><td>64807 → 7018 [ACK] Seq=1 Ack=264 Win=131072 Len=263</td></tr> <tr><td>680 342.218634</td><td>172.16.66.199</td><td>172.16.66.195</td><td>TCP</td><td>67</td><td>64807 → 7018 [PSH, ACK] Seq=264 Ack=264 Win=131072 Len=13</td></tr> <tr><td>681 342.214928</td><td>172.16.66.199</td><td>172.16.66.195</td><td>TCP</td><td>54</td><td>7010 → 64807 [ACK] Seq=1 Ack=264 Win=261824 Len=0</td></tr> <tr><td>682 342.214336</td><td>172.16.66.195</td><td>172.16.66.195</td><td>TCP</td><td>54</td><td>7010 → 64807 [ACK] Seq=1 Ack=277 Win=261824 Len=0</td></tr> <tr><td>683 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SACK_PERM=1</td></tr> <tr><td>691 351.455182</td><td>172.16.66.199</td><td>166.104.182.95</td><td>TCP</td><td>66</td><td>[TCP Retransmission] 64808 + 8443 [SYN] Seq=0 Win=64240 Len=0 MSS=1468 WS=256 SACK_PERM=1</td></tr> <tr><td>692 357.468958</td><td>172.16.66.199</td><td>166.104.182.95</td><td>TCP</td><td>66</td><td>[TCP Retransmission] 64808 + 8443 [SYN] Seq=0 Win=64240 Len=0 MSS=1468 WS=256 SACK_PERM=1</td></tr> </tbody> </table> <p>Frame 686: 54 bytes on wire (432 bits), 54 bytes captured (432 bits) on interface \Device\NPF_{6A87790B-F734-4E13-BC30-288EAC24f05}, id 0 Ethernet II, Src: IntelCor_23:b5:7c (0c:7a:15:23:b5:7c), Dst: Apple_bdb:ce (90:ec:4a:bd:b5:ce) Internet Protocol Version 4, Src: 172.16.66.199, Dst: 172.16.66.195 Transmission Control Protocol, Src Port: 64807, Dst Port: 7010, Seq: 277, Ack: 1093, Len: 0</p>	No.	Time	Source	Destination	Protocol	Length	Info	668 333.189581	20.198.162.78	172.16.66.199	TLSv1.2	228	Application Data	669 333.244083	20.198.162.78	172.16.66.199	TCP	54	64528 + 443 [ACK] Seq=345 Ack=1393 Win=510 Len=0	675 342.194206	172.16.66.199	172.16.66.195	TCP	66	64807 → 7010 [SYN] Seq=0 Win=64240 Len=0 MSS=1468 WS=256 SACK_PERM=1	676 342.199153	172.16.66.199	172.16.66.195	TCP	66	7010 → 64807 [SYN, ACK] Seq=0 Ack<1 Win=65535 Len=0 MSS=1380 WS=64 SACK_PERM=1	677 342.199234	172.16.66.199	172.16.66.195	TCP	54	64807 → 7018 [ACK] Seq=1 Ack<1 Win=131072 Len=0	678 342.202809	172.16.66.195	172.16.66.195	TCP	54	[TCP Window Update] 7018 → 64807 [ACK] Seq=1 Ack=1 Win=262144 Len=0	679 342.210690	172.16.66.199	172.16.66.195	TCP	317	64807 → 7018 [ACK] Seq=1 Ack=264 Win=131072 Len=263	680 342.218634	172.16.66.199	172.16.66.195	TCP	67	64807 → 7018 [PSH, ACK] Seq=264 Ack=264 Win=131072 Len=13	681 342.214928	172.16.66.199	172.16.66.195	TCP	54	7010 → 64807 [ACK] Seq=1 Ack=264 Win=261824 Len=0	682 342.214336	172.16.66.195	172.16.66.195	TCP	54	7010 → 64807 [ACK] Seq=1 Ack=277 Win=261824 Len=0	683 342.216558	172.16.66.199	172.16.66.195	TCP	55	7010 → 64807 [PSH, ACK] Seq=1 Ack=277 Win=262144 Len=1	684 342.221936	172.16.66.195	172.16.66.195	TCP	1144	7010 → 64807 [FIN, PSH, ACK] Seq=2 Ack=277 Win=262144 Len=1099	685 342.221711	172.16.66.199	172.16.66.195	TCP	54	64807 → 7018 [ACK] Seq=277 Ack=1093 Win=130048 Len=0	686 342.267158	172.16.66.199	172.16.66.195	TCP	54	64807 → 7018 [RST, ACK] Seq=277 Ack=1093 Win=0 Len=0	688 350.440838	172.16.66.199	166.104.182.95	TCP	66	64808 + 8443 [SYN] Seq=0 Win=64240 Len=0 MSS=1468 WS=256 SACK_PERM=1	690 351.440893	172.16.66.199	166.104.182.95	TCP	66	[TCP Retransmission] 64808 + 8443 [SYN] Seq=0 Win=64240 Len=0 MSS=1468 WS=256 SACK_PERM=1	691 351.455182	172.16.66.199	166.104.182.95	TCP	66	[TCP Retransmission] 64808 + 8443 [SYN] Seq=0 Win=64240 Len=0 MSS=1468 WS=256 SACK_PERM=1	692 357.468958	172.16.66.199	166.104.182.95	TCP	66	[TCP Retransmission] 64808 + 8443 [SYN] Seq=0 Win=64240 Len=0 MSS=1468 WS=256 SACK_PERM=1
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675 342.194206	172.16.66.199	172.16.66.195	TCP	66	64807 → 7010 [SYN] Seq=0 Win=64240 Len=0 MSS=1468 WS=256 SACK_PERM=1																																																																																																															
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686 342.267158	172.16.66.199	172.16.66.195	TCP	54	64807 → 7018 [RST, ACK] Seq=277 Ack=1093 Win=0 Len=0																																																																																																															
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4. Test Procedure 2

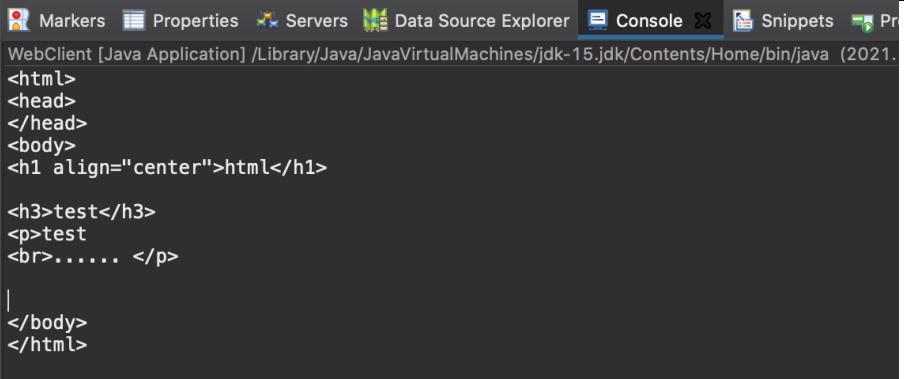
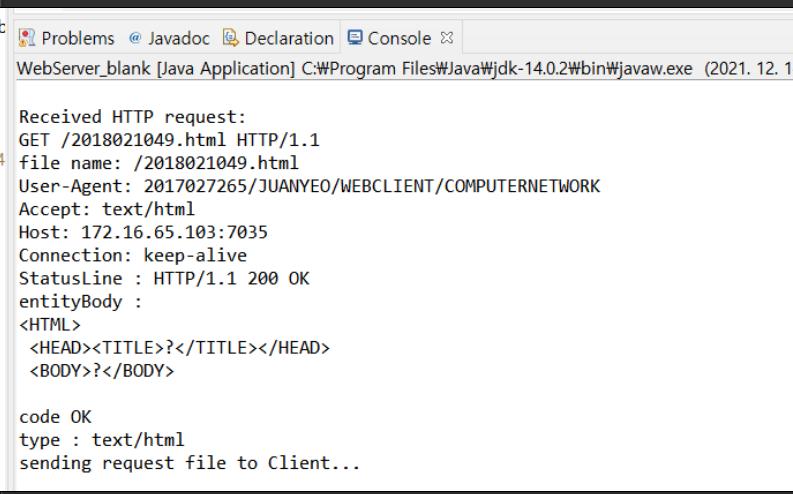
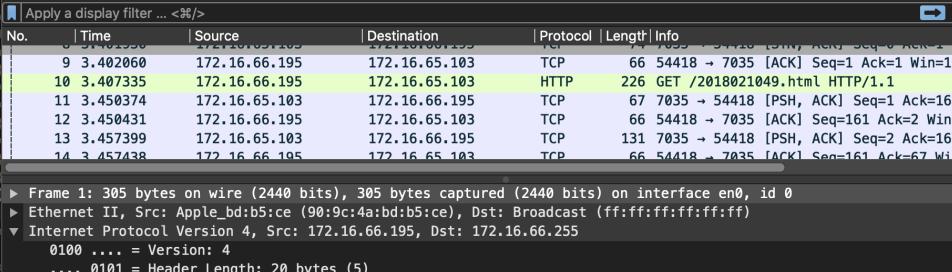
- A. Write down the name of person that you tested with

Web server owner's name	A
Web client owner's name	여주안

- B. Run wireshark

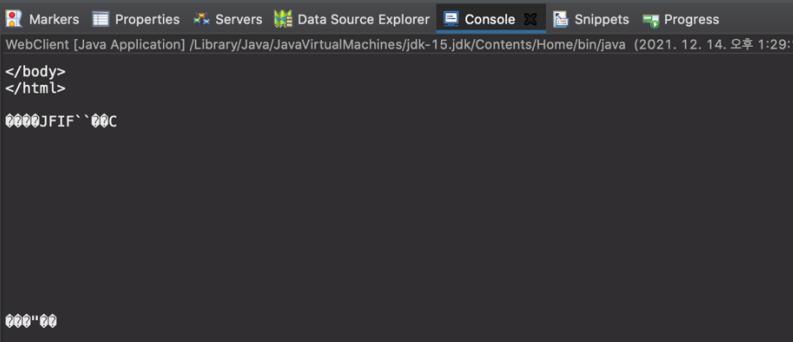
- C. Send GET Method to Web Server of your group member through your client

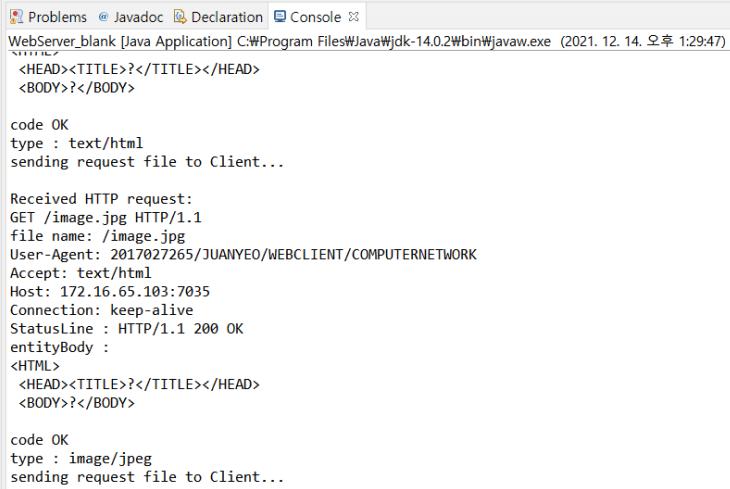
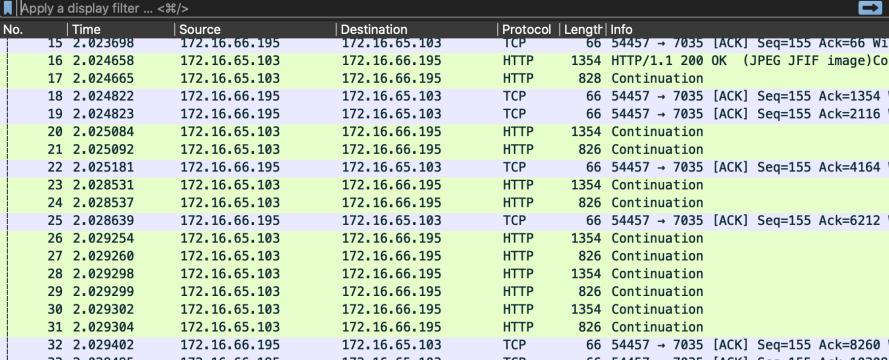
- i. Get studentID.html
(e.g. GET http://127.0.0.1:8080/studentId.html)

Result Screenshot (Client)	 <pre><html> <head> </head> <body> <h1 align="center">html</h1> <h3>test</h3> <p>test
..... </p> </body> </html></pre>																																																	
Result Screenshot (Server)	 <pre>Received HTTP request: GET /2018021049.html HTTP/1.1 file name: /2018021049.html User-Agent: 2017027265/JUANYEO/WEBCLIENT/COMPUTERNETWORK Accept: text/html Host: 172.16.65.103:7035 Connection: keep-alive StatusLine : HTTP/1.1 200 OK entityBody : <HTML> <HEAD><TITLE></TITLE></HEAD> <BODY>?</BODY> code OK type : text/html sending request file to Client...</pre>																																																	
Wireshark Screenshot	 <table border="1"> <thead> <tr> <th>No.</th> <th>Time</th> <th>Source</th> <th>Destination</th> <th>Protocol</th> <th>Length</th> <th>Info</th> </tr> </thead> <tbody> <tr> <td>9</td> <td>3.402060</td> <td>172.16.66.195</td> <td>172.16.65.103</td> <td>TCP</td> <td>66</td> <td>54418 → 7035 [ACK] Seq=1 Ack=1 Win=13</td> </tr> <tr> <td>10</td> <td>3.407335</td> <td>172.16.66.195</td> <td>172.16.65.103</td> <td>HTTP</td> <td>226</td> <td>GET /2018021049.html HTTP/1.1</td> </tr> <tr> <td>11</td> <td>3.450374</td> <td>172.16.65.103</td> <td>172.16.66.195</td> <td>TCP</td> <td>67</td> <td>7035 → 54418 [PSH, ACK] Seq=1 Ack=161 Win=13</td> </tr> <tr> <td>12</td> <td>3.450431</td> <td>172.16.66.195</td> <td>172.16.65.103</td> <td>TCP</td> <td>66</td> <td>54418 → 7035 [ACK] Seq=161 Ack=2 Win=13</td> </tr> <tr> <td>13</td> <td>3.457399</td> <td>172.16.65.103</td> <td>172.16.66.195</td> <td>TCP</td> <td>131</td> <td>7035 → 54418 [PSH, ACK] Seq=2 Ack=161 Win=13</td> </tr> <tr> <td>14</td> <td>3.457438</td> <td>172.16.66.195</td> <td>172.16.65.103</td> <td>TCP</td> <td>66</td> <td>54418 → 7035 [ACK] Seq=161 Ack=67 Win=13</td> </tr> </tbody> </table> <p>Frame 1: 305 bytes on wire (2440 bits), 305 bytes captured (2440 bits) on interface en0, id 0 ▶ Ethernet II, Src: Apple_bdb:b5:ce (00:9c:4a:bd:b5:ce), Dst: Broadcast (ff:ff:ff:ff:ff:ff) ▼ Internet Protocol Version 4, Src: 172.16.66.195, Dst: 172.16.66.255 0100 = Version: 4 0101 = Header Length: 20 bytes (5)</p>	No.	Time	Source	Destination	Protocol	Length	Info	9	3.402060	172.16.66.195	172.16.65.103	TCP	66	54418 → 7035 [ACK] Seq=1 Ack=1 Win=13	10	3.407335	172.16.66.195	172.16.65.103	HTTP	226	GET /2018021049.html HTTP/1.1	11	3.450374	172.16.65.103	172.16.66.195	TCP	67	7035 → 54418 [PSH, ACK] Seq=1 Ack=161 Win=13	12	3.450431	172.16.66.195	172.16.65.103	TCP	66	54418 → 7035 [ACK] Seq=161 Ack=2 Win=13	13	3.457399	172.16.65.103	172.16.66.195	TCP	131	7035 → 54418 [PSH, ACK] Seq=2 Ack=161 Win=13	14	3.457438	172.16.66.195	172.16.65.103	TCP	66	54418 → 7035 [ACK] Seq=161 Ack=67 Win=13
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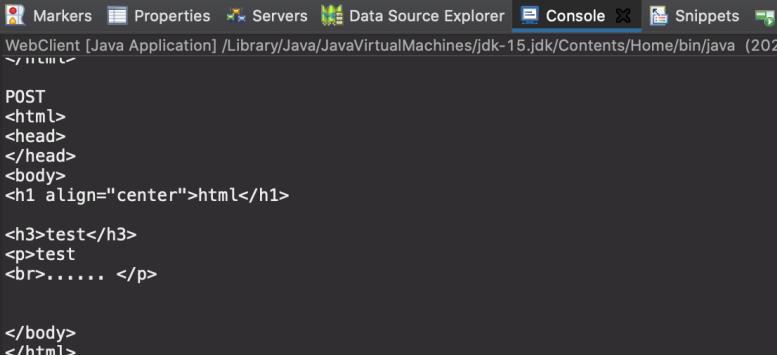
ii. Get image.jpg

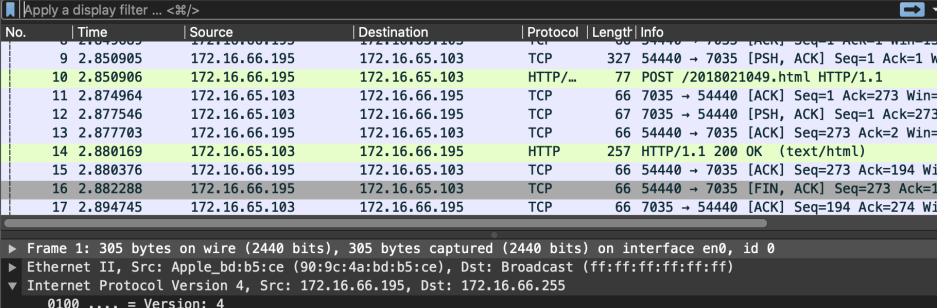
(e.g. GET http://127.0.0.1:8080/image.jpg)

Result Screenshot (Client)	 <pre></body> </html> 0000JFIF``00C 000"00</pre>
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<p>Result Screenshot (Server)</p>	 <pre> Problems @ Javadoc Declaration Console WebServer_blank [Java Application] C:\Program Files\Java\jdk-14.0.2\bin\javaw.exe (2021. 12. 14. 오후 1:29:47) <HEAD><TITLE>?</TITLE></HEAD> <BODY>?</BODY> code OK type : text/html sending request file to Client... Received HTTP request: GET /image.jpg HTTP/1.1 file name: /image.jpg User-Agent: 2017027265/JUANYEO/WEBCLIENT/COMPUTERNETWORK Accept: text/html Host: 172.16.65.103:7035 Connection: keep-alive StatusLine : HTTP/1.1 200 OK entityBody : <HTML> <HEAD><TITLE>?</TITLE></HEAD> <BODY>?</BODY> code OK type : image/jpeg sending request file to Client... </pre>																																																																																																																																												
<p>Wireshark Screenshot</p>	 <table border="1"> <thead> <tr> <th>No.</th> <th>Time</th> <th>Source</th> <th>Destination</th> <th>Protocol</th> <th>Length</th> <th>Info</th> </tr> </thead> <tbody> <tr><td>15</td><td>2.023698</td><td>172.16.66.195</td><td>172.16.65.103</td><td>TCP</td><td>66</td><td>54457 → 7035 [ACK] Seq=155 Ack=66 W[+]</td></tr> <tr><td>16</td><td>2.024658</td><td>172.16.65.103</td><td>172.16.66.195</td><td>HTTP</td><td>1354</td><td>HTTP/1.1 200 OK (JPEG JFIF image)Content-Type: image/jpegContent-Length: 1354</td></tr> <tr><td>17</td><td>2.024665</td><td>172.16.65.103</td><td>172.16.66.195</td><td>HTTP</td><td>828</td><td>Continuation</td></tr> <tr><td>18</td><td>2.024822</td><td>172.16.66.195</td><td>172.16.65.103</td><td>TCP</td><td>66</td><td>54457 → 7035 [ACK] Seq=155 Ack=1354 W[+]</td></tr> <tr><td>19</td><td>2.024823</td><td>172.16.66.195</td><td>172.16.65.103</td><td>TCP</td><td>66</td><td>54457 → 7035 [ACK] Seq=155 Ack=2116 W[+]</td></tr> <tr><td>20</td><td>2.025084</td><td>172.16.65.103</td><td>172.16.66.195</td><td>HTTP</td><td>1354</td><td>Continuation</td></tr> <tr><td>21</td><td>2.025092</td><td>172.16.65.103</td><td>172.16.66.195</td><td>HTTP</td><td>826</td><td>Continuation</td></tr> <tr><td>22</td><td>2.025181</td><td>172.16.66.195</td><td>172.16.65.103</td><td>TCP</td><td>66</td><td>54457 → 7035 [ACK] Seq=155 Ack=4164 W[+]</td></tr> <tr><td>23</td><td>2.028531</td><td>172.16.65.103</td><td>172.16.66.195</td><td>HTTP</td><td>1354</td><td>Continuation</td></tr> <tr><td>24</td><td>2.028537</td><td>172.16.65.103</td><td>172.16.66.195</td><td>HTTP</td><td>826</td><td>Continuation</td></tr> <tr><td>25</td><td>2.028639</td><td>172.16.66.195</td><td>172.16.65.103</td><td>TCP</td><td>66</td><td>54457 → 7035 [ACK] Seq=155 Ack=6212 W[+]</td></tr> <tr><td>26</td><td>2.029254</td><td>172.16.65.103</td><td>172.16.66.195</td><td>HTTP</td><td>1354</td><td>Continuation</td></tr> <tr><td>27</td><td>2.029260</td><td>172.16.65.103</td><td>172.16.66.195</td><td>HTTP</td><td>826</td><td>Continuation</td></tr> <tr><td>28</td><td>2.029298</td><td>172.16.65.103</td><td>172.16.66.195</td><td>HTTP</td><td>1354</td><td>Continuation</td></tr> <tr><td>29</td><td>2.029299</td><td>172.16.65.103</td><td>172.16.66.195</td><td>HTTP</td><td>826</td><td>Continuation</td></tr> <tr><td>30</td><td>2.029302</td><td>172.16.65.103</td><td>172.16.66.195</td><td>HTTP</td><td>1354</td><td>Continuation</td></tr> <tr><td>31</td><td>2.029304</td><td>172.16.65.103</td><td>172.16.66.195</td><td>HTTP</td><td>826</td><td>Continuation</td></tr> <tr><td>32</td><td>2.029402</td><td>172.16.66.195</td><td>172.16.65.103</td><td>TCP</td><td>66</td><td>54457 → 7035 [ACK] Seq=155 Ack=8260 W[+]</td></tr> <tr><td>33</td><td>2.029495</td><td>172.16.66.195</td><td>172.16.65.103</td><td>TCP</td><td>66</td><td>54457 → 7035 [ACK] Seq=155 Ack=10308</td></tr> </tbody> </table>	No.	Time	Source	Destination	Protocol	Length	Info	15	2.023698	172.16.66.195	172.16.65.103	TCP	66	54457 → 7035 [ACK] Seq=155 Ack=66 W[+]	16	2.024658	172.16.65.103	172.16.66.195	HTTP	1354	HTTP/1.1 200 OK (JPEG JFIF image)Content-Type: image/jpegContent-Length: 1354	17	2.024665	172.16.65.103	172.16.66.195	HTTP	828	Continuation	18	2.024822	172.16.66.195	172.16.65.103	TCP	66	54457 → 7035 [ACK] Seq=155 Ack=1354 W[+]	19	2.024823	172.16.66.195	172.16.65.103	TCP	66	54457 → 7035 [ACK] Seq=155 Ack=2116 W[+]	20	2.025084	172.16.65.103	172.16.66.195	HTTP	1354	Continuation	21	2.025092	172.16.65.103	172.16.66.195	HTTP	826	Continuation	22	2.025181	172.16.66.195	172.16.65.103	TCP	66	54457 → 7035 [ACK] Seq=155 Ack=4164 W[+]	23	2.028531	172.16.65.103	172.16.66.195	HTTP	1354	Continuation	24	2.028537	172.16.65.103	172.16.66.195	HTTP	826	Continuation	25	2.028639	172.16.66.195	172.16.65.103	TCP	66	54457 → 7035 [ACK] Seq=155 Ack=6212 W[+]	26	2.029254	172.16.65.103	172.16.66.195	HTTP	1354	Continuation	27	2.029260	172.16.65.103	172.16.66.195	HTTP	826	Continuation	28	2.029298	172.16.65.103	172.16.66.195	HTTP	1354	Continuation	29	2.029299	172.16.65.103	172.16.66.195	HTTP	826	Continuation	30	2.029302	172.16.65.103	172.16.66.195	HTTP	1354	Continuation	31	2.029304	172.16.65.103	172.16.66.195	HTTP	826	Continuation	32	2.029402	172.16.66.195	172.16.65.103	TCP	66	54457 → 7035 [ACK] Seq=155 Ack=8260 W[+]	33	2.029495	172.16.66.195	172.16.65.103	TCP	66	54457 → 7035 [ACK] Seq=155 Ack=10308
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D. Send POST Method to Web Server of group member through your client
(e.g. POST http://127.0.0.1:8080/studentId.html)

<p>Result Screenshot (Client)</p>	 <pre> POST <html> <head> </head> <body> <h1 align="center">html</h1> <h3>test</h3> <p>test
..... </p> </body> </html> </pre>
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Result Screenshot (Server)	<pre>Problems @ Javadoc Declaration Console WebServer_blank [Java Application] C:\Program Files\Java\jdk-14.0.2\bin\javaw.exe (2021. 12. 14. code OK type : text/html sending request file to Client... Received HTTP request: POST /2018021049.html HTTP/1.1 file name: /2018021049.html Content-Type: text/xml;charset=UTF-8 User-Agent: 2017027265/JUANYEO/WEBCLIENT/COMPUTERNETWORK Accept: text/xml Cache-Control: no-cache Pragma: no-cache Host: 172.16.65.103:7035 Connection: keep-alive Content-Length: 11 StatusLine : HTTP/1.1 200 OK entityBody : <HTML> <HEAD><TITLE>?</TITLE></HEAD> <BODY>?</BODY> code OK type : text/html sending request file to Client...</pre>
Wireshark Screenshot	 <p>Frame 1: 305 bytes on wire (2440 bits), 305 bytes captured (2440 bits) on interface en0, id 0 ▶ Ethernet II, Src: Apple_bdb:b5:ce (90:9c:4a:bdb:b5:ce), Dst: Broadcast (ff:ff:ff:ff:ff:ff) ▶ Internet Protocol Version 4, Src: 172.16.66.195, Dst: 172.16.66.255 0100 = Version: 4</p>

5. Test Procedure

- A. Write down the name of person that you tested with

Web server owner's name	여주안
Web client owner's name	A

- B. Run wireshark

- C. Send GET Method to Web Server of your group member through your client

- i. Get studentID.html

(e.g. GET http://127.0.0.1:8080/studentId.html)

Result Screens hot (Client)	<pre>Problems @ Javadoc Declaration Console <terminated> WebClient [Java Application] C:\Program Files\Java\jdk-14.0.2\bin\javaw.exe (2021. 12. 14. 오후 1:20:11 ~ 오후 1:20:13) <html> <body> KYH SERVER TEST PAGE 1234567890ABC
 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nam bibendum mi suscipit, mattis metus sit amet, elementum enim. Nulla Nunc velit elit, egestas non posuere a, hendrerit non enim. Maecenas sed tortor erat. Sed non nulla sapien. Duis accumsan, nisi </body> </html></pre>
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Result	Markers	Properties	Servers	Data Source Explorer	Console		
Screens					WebServer [Java Application] /Library/Java/JavaVirtualMachines/jdk-15.jdk/Contents/Ho		
hot					Received HTTP request: GET /2017027265.html HTTP/1.1 User-Agent: 2018021049/MINJUNGKIM/WEBCLIENT/COMPUTERNETWORK Accept: text/html Host: 172.16.66.195:7010 Connection: keep-alive statusLine: HTTP/1.1 200 OK code: OK Sending requested file to client...		
(Server)							
Wireshark	No.	Time	Protocol	Source	Destination	Length	Info
	1	0.0000000	TCP	107.20.137.119	172.16.65.103	54	443 → 49799 [ACK] Seq=1 Ack=1 Win=13 Len=0
	2	0.000129	TCP	172.16.65.103	107.20.137.119	54	[TCP ACKed unseen segment] 49799 → 443 [ACK] Seq=1 Ack=2 Win=512 Len=0
	3	2.653862	TCP	172.16.65.103	166.104.182.95	66	49856 → 8443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
	4	3.009244	TCP	172.16.65.103	166.104.182.95	66	49855 → 8443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
	5	3.369304	TCP	172.16.65.103	104.26.10.240	54	49829 → 443 [FIN, ACK] Seq=1 Ack=1 Win=1020 Len=0
	8	3.444705	TCP	104.26.10.240	172.16.65.103	54	443 → 49829 [FIN, ACK] Seq=1 Ack=2 Win=69 Len=0
	9	3.444882	TCP	172.16.65.103	104.26.10.240	54	49829 → 443 [ACK] Seq=2 Ack=2 Win=1020 Len=0
	10	3.468148	TCP	13.197.21.208	172.16.65.103	54	443 → 49823 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0
	11	4.293611	TCP	172.16.65.103	172.16.66.195	66	49857 → 7010 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
	12	4.286395	TCP	172.16.66.195	172.16.65.103	66	7010 → 49857 [SYN, ACK] Seq=0 Ack=1 Win=1300 MSS=1300 WS=64 SACK_PERM=1
	13	4.286532	TCP	172.16.65.103	172.16.66.195	54	49857 → 7010 [ACK] Seq=1 Ack=1 Win=130752 Len=0
	14	4.289552	TCP	172.16.66.195	172.16.65.103	54	[TCP Window Update] 7010 → 49857 [ACK] Seq=1 Ack=1 Win=262144 Len=0
	15	4.291158	TCP	172.16.65.103	172.16.66.195	217	49857 → 7010 [PSH, ACK] Seq=1 Ack=1 Win=131072 Len=163
	16	4.294523	TCP	172.16.66.195	172.16.65.103	54	7010 → 49857 [ACK] Seq=1 Ack=164 Win=261952 Len=0
	17	4.295496	TCP	172.16.66.195	172.16.65.103	55	7010 → 49857 [PSH, ACK] Seq=1 Ack=164 Win=262144 Len=1
	18	4.299369	TCP	172.16.66.195	172.16.65.103	1144	7010 → 49857 [FIN, PSH, ACK] Seq=2 Ack=164 Win=62144 Len=1090
	19	4.299463	TCP	172.16.65.103	172.16.66.195	54	49857 → 7010 [ACK] Seq=164 Ack=1093 Win=130048 Len=0
	20	4.344561	TCP	172.16.65.103	172.16.66.195	54	49857 → 7010 [RST, ACK] Seq=164 Ack=1093 Win=0 Len=0
					> Frame 1: 54 bytes on wire (432 bits), 54 bytes captured (432 bits) on interface \Device\NPF_{56A5598B-2284-4F5C-B6E2-218836B88041}, id 0 > Ethernet II, Src: Cisco_6a:08:7f (00:0d:78:6a:08:7f), Dst: IntelCor_9f:ac:81 (74:e5:f9:9f:ac:81) > Internet Protocol Version 4, Src: 107.20.137.119, Dst: 172.16.65.103 > Transmission Control Protocol, Src Port: 49799, Dst Port: 49979, Seq: 1, Ack: 1, Len: 0		

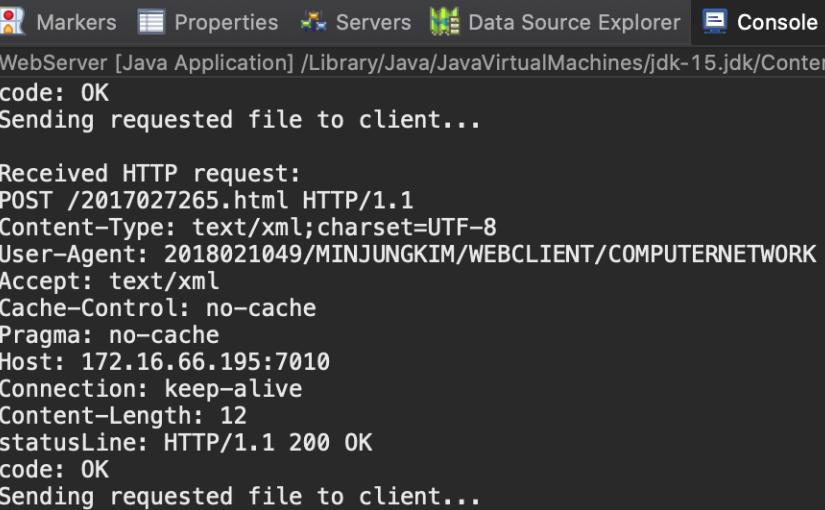
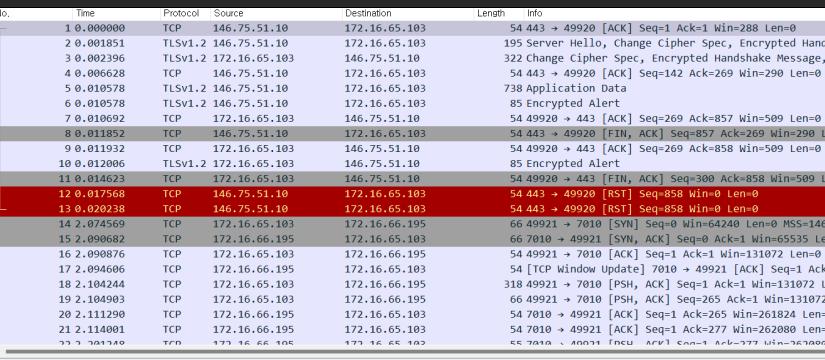
ii. Get image.jpg

(e.g. GET http://127.0.0.1:8080/image.jpg)

No.	Time	Protocol	Source	Destination	Length	Info
1	0.000000	TCP	172.16.65.103	166.104.182.95	66	49893 → 8443 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
2	4.748946	TCP	172.16.65.103	172.16.66.195	66	49894 → 7010 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
3	4.753882	TCP	172.16.65.103	172.16.65.103	66	7010 → 49894 [SYN, ACK] Seq=1 Ack=1 Win=65535 Len=0 MSS=1300 WS=64 SACK_PERM=1
4	4.753966	TCP	172.16.65.103	172.16.66.195	54	49894 → 7010 [ACK] Seq=1 Ack=1 Win=131072 Len=0
5	4.756435	TCP	172.16.66.195	172.16.65.103	54	[TCP Window Update] 7010 → 49894 [ACK] Seq=1 Ack=1 Win=262144 Len=0
6	4.758040	TCP	172.16.65.103	172.16.66.195	211	49894 → 7010 [PSH, ACK] Seq=1 Ack=1 Win=131072 Len=157
7	4.761078	TCP	172.16.66.195	172.16.65.103	54	7010 → 49894 [ACK] Seq=1 Ack=158 Win=261952 Len=0
8	4.762894	TCP	172.16.66.195	172.16.65.103	55	7010 → 49894 [PSH, ACK] Seq=1 Ack=158 Win=262144 Len=1
9	4.766561	TCP	172.16.66.195	172.16.65.103	1333	7010 → 49894 [FIN, PSH, ACK] Seq=2 Ack=158 Win=262144 Len=1279
10	4.766650	TCP	172.16.65.103	172.16.66.195	54	49894 → 7010 [ACK] Seq=158 Ack=1282 Win=129792 Len=0
11	4.838374	TCP	172.16.65.103	172.16.66.195	54	49894 → 7010 [RST, ACK] Seq=158 Ack=1282 Win=0 Len=0
12	6.651468	TLSV1.2	52.69.179.230	172.16.65.103	575	Application Data
13	6.678995	TCP	172.16.65.103	52.69.179.230	1354	65512 → 443 [ACK] Seq=1 Ack=522 Win=508 Len=1300 [TCP segment of a reassembled
14	6.678995	TLSV1.2	172.16.65.103	52.69.179.230	656	Application Data
15	6.722275	TCP	52.69.179.230	172.16.65.103	54	443 → 65512 [ACK] Seq=522 Ack=1903 Win=767 Len=0

> Frame 1: 66 bytes on wire (538 bits), 66 bytes captured (528 bits) on interface \Device\NPF_{56A5598B-22B4-4F5C-B62E-218836B8041E}, id 0
> Ethernet II, Src: IntelCor_9f:ac:81 (74:e5:f9:f9:ac:81), Dst: IETF-VRRP-VRID_C9 (00:00:5e:00:01:c9)
> Internet Protocol Version 4, Src: 172.16.65.103, Dst: 166.104.182.95
> Transmission Control Protocol, Src Port: 49893, Dst Port: 8443, Seq: 0, Len: 0

D. Send POST Method to Web Server of group member through your client (e.g. POST http://127.0.0.1:8080/studentId.html)

Result Screens hot (Client)	 <pre> <html> <body> KYH SERVER TEST PAGE 1234567890ABC
 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nam bibendum mi suscipit, mattis metus sit amet, elementum enim. Nunc velit elit, egestas non posuere a, hendrerit non enim. Maecenas sed tortor erat. Sed non nulla sapien. Duis accumsan, </body> </html> </pre>																																																																																																																																																										
Result Screens hot (Server)	 <pre> Markers Properties Servers Data Source Explorer Console Snippets WebServer [Java Application] /Library/Java/JavaVirtualMachines/jdk-15.jdk/Contents/Home/bin/java (2 code: OK Sending requested file to client... Received HTTP request: POST /2017027265.html HTTP/1.1 Content-Type: text/xml;charset=UTF-8 User-Agent: 2018021049/MINJUNGKIM/WEBCLIENT/COMPUTERNETWORK Accept: text/xml Cache-Control: no-cache Pragma: no-cache Host: 172.16.66.195:7010 Connection: keep-alive Content-Length: 12 statusLine: HTTP/1.1 200 OK code: OK Sending requested file to client... </pre>																																																																																																																																																										
Wireshark Screens hot	 <table border="1"> <thead> <tr> <th>No.</th> <th>Time</th> <th>Protocol</th> <th>Source</th> <th>Destination</th> <th>Length</th> <th>Info</th> </tr> </thead> <tbody> <tr> <td>1</td><td>0.000000</td><td>TCP</td><td>146.75.51.10</td><td>172.16.65.103</td><td>54</td><td>443 → 49920 [ACK] Seq=1 Ack=1 Win=288 Len=0</td></tr> <tr> <td>2</td><td>0.001851</td><td>TLSv1.2</td><td>146.75.51.10</td><td>172.16.65.103</td><td>195</td><td>Server Hello, Change Cipher Spec, Encrypted Handshake Message</td></tr> <tr> <td>3</td><td>0.002396</td><td>TLSv1.2</td><td>172.16.65.103</td><td>146.75.51.10</td><td>322</td><td>Change Cipher Spec, Encrypted Handshake Message, Application Data</td></tr> <tr> <td>4</td><td>0.006628</td><td>TCP</td><td>146.75.51.10</td><td>172.16.65.103</td><td>54</td><td>443 → 49920 [ACK] Seq=142 Ack=269 Win=290 Len=0</td></tr> <tr> <td>5</td><td>0.010578</td><td>TLSv1.2</td><td>146.75.51.10</td><td>172.16.65.103</td><td>738</td><td>Application Data</td></tr> <tr> <td>6</td><td>0.010578</td><td>TLSv1.2</td><td>146.75.51.10</td><td>172.16.65.103</td><td>85</td><td>Encrypted Alert</td></tr> <tr> <td>7</td><td>0.010692</td><td>TCP</td><td>172.16.65.103</td><td>146.75.51.10</td><td>54</td><td>49920 → 443 [ACK] Seq=269 Ack=857 Win=509 Len=0</td></tr> <tr> <td>8</td><td>0.011852</td><td>TCP</td><td>146.75.51.10</td><td>172.16.65.103</td><td>54</td><td>443 → 49920 [FIN, ACK] Seq=857 Ack=269 Win=290 Len=0</td></tr> <tr> <td>9</td><td>0.011932</td><td>TCP</td><td>172.16.65.103</td><td>146.75.51.10</td><td>54</td><td>49920 → 443 [ACK] Seq=269 Ack=858 Win=509 Len=0</td></tr> <tr> <td>10</td><td>0.012006</td><td>TLSv1.2</td><td>172.16.65.103</td><td>146.75.51.10</td><td>85</td><td>Encrypted Alert</td></tr> <tr> <td>11</td><td>0.014623</td><td>TCP</td><td>172.16.65.103</td><td>146.75.51.10</td><td>54</td><td>49920 → 443 [FIN, ACK] Seq=300 Ack=858 Win=509 Len=0</td></tr> <tr> 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Len=0</td></tr> <tr> <td>18</td><td>2.104244</td><td>TCP</td><td>172.16.65.103</td><td>172.16.66.195</td><td>318</td><td>49921 → 7010 [PSH, ACK] Seq=1 Ack=1 Win=131072 Len=264</td></tr> <tr> <td>19</td><td>2.104903</td><td>TCP</td><td>172.16.65.103</td><td>172.16.66.195</td><td>66</td><td>49921 → 7010 [PSH, ACK] Seq=265 Ack=1 Win=131072 Len=12</td></tr> <tr> <td>20</td><td>2.111290</td><td>TCP</td><td>172.16.66.195</td><td>172.16.65.103</td><td>54</td><td>7010 → 49921 [ACK] Seq=1 Ack=265 Win=261824 Len=0</td></tr> <tr> <td>21</td><td>2.111401</td><td>TCP</td><td>172.16.66.195</td><td>172.16.65.103</td><td>54</td><td>7010 → 49921 [ACK] Seq=1 Ack=277 Win=262080 Len=0</td></tr> </tbody> </table> <p>> Frame 1: 54 bytes on wire (432 bits), 54 bytes captured (432 bits) on interface \Device\NPF_{56A5598B-22B4-4F5C-B62E-218836B8041E}, id 0 > Ethernet II, Src: Cisco_Ga0:08:7f (00:d7:8f:6a:08:7f), Dst: IntelCor_9f:ac:81 (74:e5:f9:f9:ac:81) > Internet Protocol Version 4, Src: 146.75.51.10, Dst: 172.16.66.195 > Transmission Control Protocol, Src Port: 443, Dst Port: 80, Seq: 1, Ack: 1, Len: 0</p>	No.	Time	Protocol	Source	Destination	Length	Info	1	0.000000	TCP	146.75.51.10	172.16.65.103	54	443 → 49920 [ACK] Seq=1 Ack=1 Win=288 Len=0	2	0.001851	TLSv1.2	146.75.51.10	172.16.65.103	195	Server Hello, Change Cipher Spec, Encrypted Handshake Message	3	0.002396	TLSv1.2	172.16.65.103	146.75.51.10	322	Change Cipher Spec, Encrypted Handshake Message, Application Data	4	0.006628	TCP	146.75.51.10	172.16.65.103	54	443 → 49920 [ACK] Seq=142 Ack=269 Win=290 Len=0	5	0.010578	TLSv1.2	146.75.51.10	172.16.65.103	738	Application Data	6	0.010578	TLSv1.2	146.75.51.10	172.16.65.103	85	Encrypted Alert	7	0.010692	TCP	172.16.65.103	146.75.51.10	54	49920 → 443 [ACK] Seq=269 Ack=857 Win=509 Len=0	8	0.011852	TCP	146.75.51.10	172.16.65.103	54	443 → 49920 [FIN, ACK] Seq=857 Ack=269 Win=290 Len=0	9	0.011932	TCP	172.16.65.103	146.75.51.10	54	49920 → 443 [ACK] Seq=269 Ack=858 Win=509 Len=0	10	0.012006	TLSv1.2	172.16.65.103	146.75.51.10	85	Encrypted Alert	11	0.014623	TCP	172.16.65.103	146.75.51.10	54	49920 → 443 [FIN, ACK] Seq=300 Ack=858 Win=509 Len=0	12	0.017568	TCP	146.75.51.10	172.16.65.103	54	443 → 49920 [RST] Seq=858 Win=0 Len=0	13	0.020238	TCP	146.75.51.10	172.16.65.103	54	443 → 49920 [RST] Seq=858 Win=0 Len=0	14	2.074569	TCP	172.16.65.103	172.16.66.195	66	49921 → 7010 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1	15	2.099682	TCP	172.16.66.195	172.16.65.103	66	7010 → 49921 [SYN, ACK] Seq=1 Ack=1 Win=65535 Len=0 MSS=1300 WS=64 SACK_PERM=1	16	2.099876	TCP	172.16.65.103	172.16.66.195	54	49921 → 7010 [ACK] Seq=1 Ack=1 Win=131072 Len=0	17	2.099466	TCP	172.16.66.195	172.16.65.103	54	[TCP Window Update] 7010 → 49921 [ACK] Seq=1 Ack=1 Win=262144 Len=0	18	2.104244	TCP	172.16.65.103	172.16.66.195	318	49921 → 7010 [PSH, ACK] Seq=1 Ack=1 Win=131072 Len=264	19	2.104903	TCP	172.16.65.103	172.16.66.195	66	49921 → 7010 [PSH, ACK] Seq=265 Ack=1 Win=131072 Len=12	20	2.111290	TCP	172.16.66.195	172.16.65.103	54	7010 → 49921 [ACK] Seq=1 Ack=265 Win=261824 Len=0	21	2.111401	TCP	172.16.66.195	172.16.65.103	54	7010 → 49921 [ACK] Seq=1 Ack=277 Win=262080 Len=0
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6. Test Procedure 3

- A. Write down the name of person that you tested with

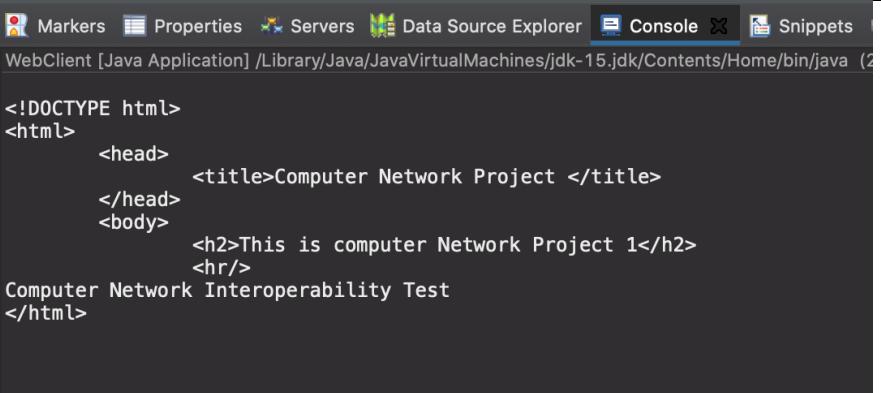
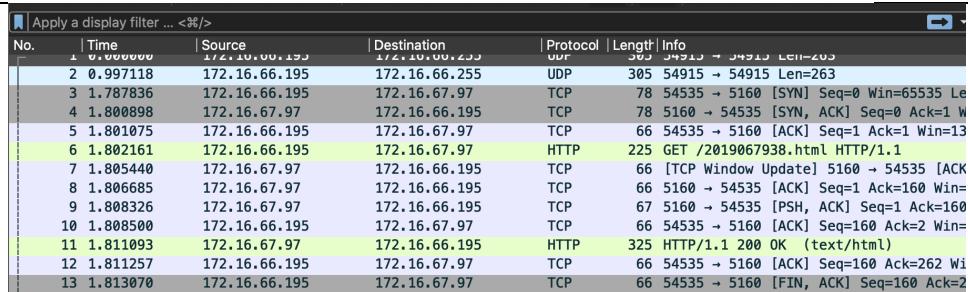
Web server owner's name	C
Web client owner's name	여주안

- B. Run wireshark

- C. Send GET Method to Web Server of your group member through your client

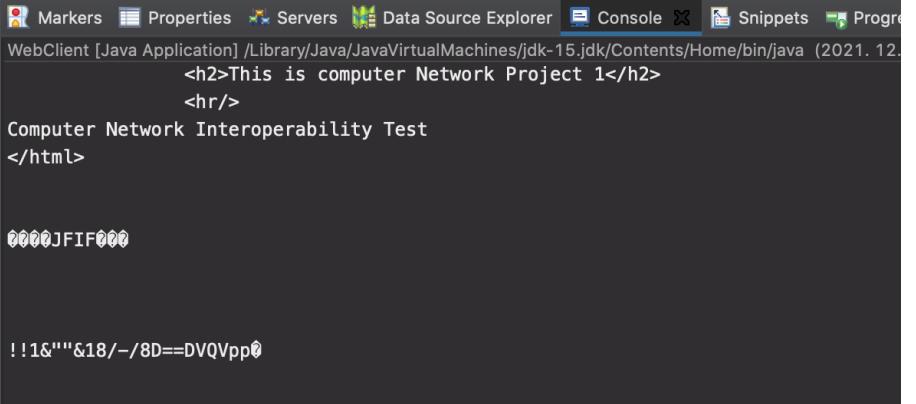
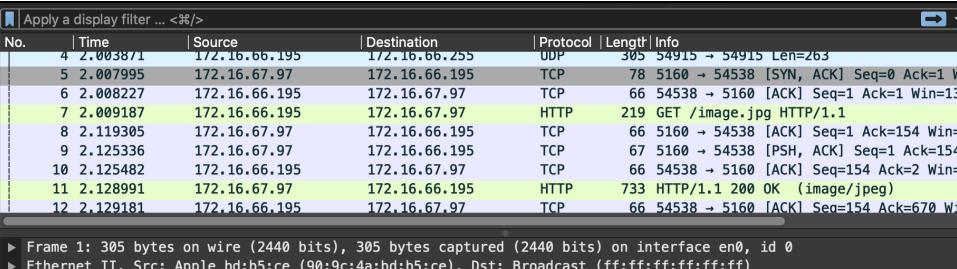
- i. Get studentID.html

(e.g. GET http://127.0.0.1:8080/studentId.html)

Result Screenshot (Client)	 <pre><!DOCTYPE html> <html> <head> <title>Computer Network Project </title> </head> <body> <h2>This is computer Network Project 1</h2> <hr/> Computer Network Interoperability Test </body> </pre>																																																																																											
Result Screenshot (Server)	<pre>Received HTTP request: GET /2019067938.html HTTP/1.1 1 ./2019067938.html User-Agent: 2017027265/JUANYEO/WEBCLIENT/COMPUTERNETWORK Accept: text/html Host: 172.16.67.97:5160 Connection: keep-alive statusLine: HTTP/1.1 200 OK code: OK type : text/html Sending requested file to client...</pre>																																																																																											
Wireshark Screenshot	 <table border="1"> <thead> <tr> <th>No.</th> <th>Time</th> <th>Source</th> <th>Destination</th> <th>Protocol</th> <th>Length</th> <th>Info</th> </tr> </thead> <tbody> <tr><td>2</td><td>0.997118</td><td>172.16.66.195</td><td>172.16.66.255</td><td>UDP</td><td>305</td><td>54915 → 54915 Len=263</td></tr> <tr><td>3</td><td>1.787836</td><td>172.16.66.195</td><td>172.16.67.97</td><td>TCP</td><td>78</td><td>54535 → 5160 [SYN] Seq=0 Win=65535 Len=13</td></tr> <tr><td>4</td><td>1.800898</td><td>172.16.67.97</td><td>172.16.66.195</td><td>TCP</td><td>78</td><td>5160 → 54535 [SYN, ACK] Seq=0 Ack=1 Win=13</td></tr> <tr><td>5</td><td>1.801075</td><td>172.16.66.195</td><td>172.16.67.97</td><td>TCP</td><td>66</td><td>54535 → 5160 [ACK] Seq=1 Ack=1 Win=13</td></tr> <tr><td>6</td><td>1.802161</td><td>172.16.66.195</td><td>172.16.67.97</td><td>HTTP</td><td>225</td><td>225 GET /2019067938.html HTTP/1.1</td></tr> <tr><td>7</td><td>1.805440</td><td>172.16.67.97</td><td>172.16.66.195</td><td>TCP</td><td>66</td><td>[TCP Window Update] 5160 → 54535 [ACK]</td></tr> <tr><td>8</td><td>1.806685</td><td>172.16.67.97</td><td>172.16.66.195</td><td>TCP</td><td>66</td><td>5160 → 54535 [ACK] Seq=1 Ack=160 Win=13</td></tr> <tr><td>9</td><td>1.808326</td><td>172.16.67.97</td><td>172.16.66.195</td><td>TCP</td><td>67</td><td>5160 → 54535 [PSH, ACK] Seq=1 Ack=160 Win=13</td></tr> <tr><td>10</td><td>1.808500</td><td>172.16.66.195</td><td>172.16.67.97</td><td>TCP</td><td>66</td><td>54535 → 5160 [ACK] Seq=160 Ack=2 Win=13</td></tr> <tr><td>11</td><td>1.811093</td><td>172.16.67.97</td><td>172.16.66.195</td><td>HTTP</td><td>325</td><td>325 HTTP/1.1 200 OK (text/html)</td></tr> <tr><td>12</td><td>1.811257</td><td>172.16.66.195</td><td>172.16.67.97</td><td>TCP</td><td>66</td><td>54535 → 5160 [ACK] Seq=160 Ack=262 Win=13</td></tr> <tr><td>13</td><td>1.813070</td><td>172.16.66.195</td><td>172.16.67.97</td><td>TCP</td><td>66</td><td>54535 → 5160 [FIN, ACK] Seq=160 Ack=2</td></tr> </tbody> </table>	No.	Time	Source	Destination	Protocol	Length	Info	2	0.997118	172.16.66.195	172.16.66.255	UDP	305	54915 → 54915 Len=263	3	1.787836	172.16.66.195	172.16.67.97	TCP	78	54535 → 5160 [SYN] Seq=0 Win=65535 Len=13	4	1.800898	172.16.67.97	172.16.66.195	TCP	78	5160 → 54535 [SYN, ACK] Seq=0 Ack=1 Win=13	5	1.801075	172.16.66.195	172.16.67.97	TCP	66	54535 → 5160 [ACK] Seq=1 Ack=1 Win=13	6	1.802161	172.16.66.195	172.16.67.97	HTTP	225	225 GET /2019067938.html HTTP/1.1	7	1.805440	172.16.67.97	172.16.66.195	TCP	66	[TCP Window Update] 5160 → 54535 [ACK]	8	1.806685	172.16.67.97	172.16.66.195	TCP	66	5160 → 54535 [ACK] Seq=1 Ack=160 Win=13	9	1.808326	172.16.67.97	172.16.66.195	TCP	67	5160 → 54535 [PSH, ACK] Seq=1 Ack=160 Win=13	10	1.808500	172.16.66.195	172.16.67.97	TCP	66	54535 → 5160 [ACK] Seq=160 Ack=2 Win=13	11	1.811093	172.16.67.97	172.16.66.195	HTTP	325	325 HTTP/1.1 200 OK (text/html)	12	1.811257	172.16.66.195	172.16.67.97	TCP	66	54535 → 5160 [ACK] Seq=160 Ack=262 Win=13	13	1.813070	172.16.66.195	172.16.67.97	TCP	66	54535 → 5160 [FIN, ACK] Seq=160 Ack=2
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13	1.813070	172.16.66.195	172.16.67.97	TCP	66	54535 → 5160 [FIN, ACK] Seq=160 Ack=2																																																																																						

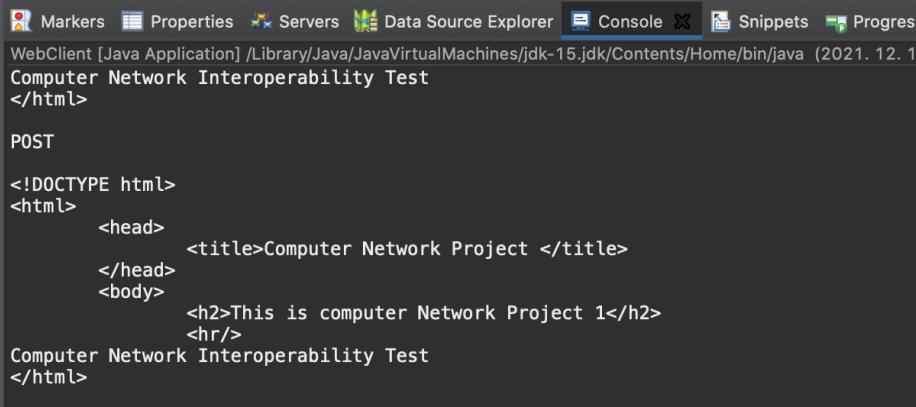
- ii. Get image.jpg

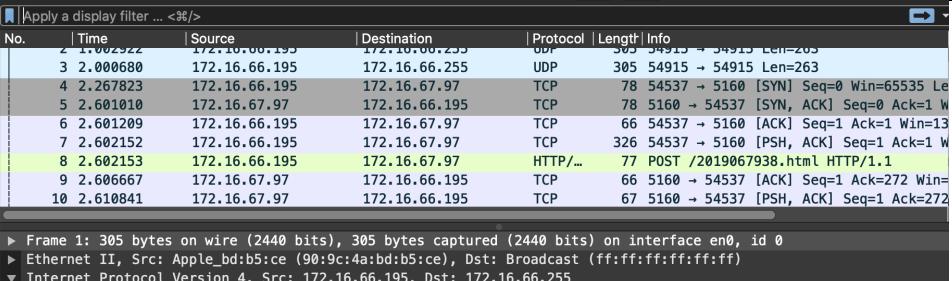
(e.g. GET http://127.0.0.1:8080/image.jpg)

Result Screenshot (Client)	 <pre><h2>This is computer Network Project 1</h2> <hr/> Computer Network Interoperability Test </html> ????JFIF??? !!1&"&18/-/8D==DVQVpp@</pre>																																																																						
Result Screenshot (Server)	<pre>Received HTTP request: GET /image.jpg HTTP/1.1 ./image.jpg User-Agent: 2017027265/JUANYEO/WEBCLIENT/COMPUTERNETWORK Accept: text/html Host: 172.16.67.97:5160 Connection: keep-alive statusline: HTTP/1.1 200 OK code: OK type : image/jpeg Sending requested file to client...</pre>																																																																						
Wireshark Screenshot	 <table border="1"> <thead> <tr> <th>No.</th> <th>Time</th> <th>Source</th> <th>Destination</th> <th>Protocol</th> <th>Length</th> <th>Info</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>2.003871</td> <td>172.16.66.195</td> <td>172.16.66.255</td> <td>UDP</td> <td>305</td> <td>54915 → 54915 Len=263</td> </tr> <tr> <td>5</td> <td>2.007995</td> <td>172.16.67.97</td> <td>172.16.66.195</td> <td>TCP</td> <td>78</td> <td>5160 → 54538 [SYN, ACK] Seq=0 Ack=1 Win=13</td> </tr> <tr> <td>6</td> <td>2.008227</td> <td>172.16.66.195</td> <td>172.16.67.97</td> <td>TCP</td> <td>66</td> <td>54538 → 5160 [ACK] Seq=1 Ack=1 Win=13</td> </tr> <tr> <td>7</td> <td>2.009187</td> <td>172.16.66.195</td> <td>172.16.67.97</td> <td>HTTP</td> <td>219</td> <td>GET /image.jpg HTTP/1.1</td> </tr> <tr> <td>8</td> <td>2.119305</td> <td>172.16.67.97</td> <td>172.16.66.195</td> <td>TCP</td> <td>66</td> <td>5160 → 54538 [ACK] Seq=1 Ack=154 Win=154</td> </tr> <tr> <td>9</td> <td>2.125336</td> <td>172.16.67.97</td> <td>172.16.66.195</td> <td>TCP</td> <td>67</td> <td>5160 → 54538 [PSH, ACK] Seq=1 Ack=154 Win=154</td> </tr> <tr> <td>10</td> <td>2.125482</td> <td>172.16.66.195</td> <td>172.16.67.97</td> <td>TCP</td> <td>66</td> <td>54538 → 5160 [ACK] Seq=154 Ack=2 Win=154</td> </tr> <tr> <td>11</td> <td>2.128991</td> <td>172.16.67.97</td> <td>172.16.66.195</td> <td>HTTP</td> <td>733</td> <td>HTTP/1.1 200 OK (image/jpeg)</td> </tr> <tr> <td>12</td> <td>2.129181</td> <td>172.16.66.195</td> <td>172.16.67.97</td> <td>TCP</td> <td>66</td> <td>54538 → 5160 [ACK] Seq=154 Ack=670 Win=154</td> </tr> </tbody> </table> <p>► Frame 1: 305 bytes on wire (2440 bits), 305 bytes captured (2440 bits) on interface en0, id 0 ► Ethernet II, Src: Apple_b5:ce (90:9c:4a:b5:ce), Dst: Broadcast (ff:ff:ff:ff:ff:ff)</p>	No.	Time	Source	Destination	Protocol	Length	Info	4	2.003871	172.16.66.195	172.16.66.255	UDP	305	54915 → 54915 Len=263	5	2.007995	172.16.67.97	172.16.66.195	TCP	78	5160 → 54538 [SYN, ACK] Seq=0 Ack=1 Win=13	6	2.008227	172.16.66.195	172.16.67.97	TCP	66	54538 → 5160 [ACK] Seq=1 Ack=1 Win=13	7	2.009187	172.16.66.195	172.16.67.97	HTTP	219	GET /image.jpg HTTP/1.1	8	2.119305	172.16.67.97	172.16.66.195	TCP	66	5160 → 54538 [ACK] Seq=1 Ack=154 Win=154	9	2.125336	172.16.67.97	172.16.66.195	TCP	67	5160 → 54538 [PSH, ACK] Seq=1 Ack=154 Win=154	10	2.125482	172.16.66.195	172.16.67.97	TCP	66	54538 → 5160 [ACK] Seq=154 Ack=2 Win=154	11	2.128991	172.16.67.97	172.16.66.195	HTTP	733	HTTP/1.1 200 OK (image/jpeg)	12	2.129181	172.16.66.195	172.16.67.97	TCP	66	54538 → 5160 [ACK] Seq=154 Ack=670 Win=154
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D. Send POST Method to Web Server of group member through your client

(e.g. POST http://127.0.0.1:8080/studentId.html)

Result Screenshot (Client)	 <pre>POST <!DOCTYPE html> <html> <head> <title>Computer Network Project </title> </head> <body> <h2>This is computer Network Project 1</h2> <hr/> Computer Network Interoperability Test </body> </html></pre>
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Result Screenshot (Server)	<pre>Received HTTP request: POST /2019067938.html HTTP/1.1 1 ./2019067938.html Content-Type: text/xml; charset=UTF-8 User-Agent: 2017027265/JUANYEO/WEBCLIENT/COMPUTERNETWORK Accept: text/xml Cache-Control: no-cache Pragma: no-cache Host: 172.16.67.97:5160 Connection: keep-alive Content-Length: 11 statusLine: HTTP/1.1 200 OK code: OK type : text/html Sending requested file to client...</pre>																																																																						
Wireshark Screenshot	 <table border="1"> <thead> <tr> <th>No.</th> <th>Time</th> <th>Source</th> <th>Destination</th> <th>Protocol</th> <th>Length</th> <th>Info</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>1.002922</td> <td>172.16.66.195</td> <td>172.16.66.255</td> <td>UDP</td> <td>305</td> <td>54915 → 54915 Len=263</td> </tr> <tr> <td>3</td> <td>2.000680</td> <td>172.16.66.195</td> <td>172.16.66.255</td> <td>UDP</td> <td>305</td> <td>54915 → 54915 Len=263</td> </tr> <tr> <td>4</td> <td>2.267823</td> <td>172.16.66.195</td> <td>172.16.67.97</td> <td>TCP</td> <td>78</td> <td>54537 → 5160 [SYN] Seq=0 Win=65535 Len=13</td> </tr> <tr> <td>5</td> <td>2.601010</td> <td>172.16.67.97</td> <td>172.16.66.195</td> <td>TCP</td> <td>78</td> <td>5160 → 54537 [SYN, ACK] Seq=0 Ack=1 Win=13</td> </tr> <tr> <td>6</td> <td>2.601209</td> <td>172.16.66.195</td> <td>172.16.67.97</td> <td>TCP</td> <td>66</td> <td>54537 → 5160 [ACK] Seq=1 Ack=1 Win=13</td> </tr> <tr> <td>7</td> <td>2.602152</td> <td>172.16.66.195</td> <td>172.16.67.97</td> <td>TCP</td> <td>326</td> <td>54537 → 5160 [PSH, ACK] Seq=1 Ack=1 Win=13</td> </tr> <tr> <td>8</td> <td>2.602153</td> <td>172.16.66.195</td> <td>172.16.67.97</td> <td>HTTP/...</td> <td>77</td> <td>POST /2019067938.html HTTP/1.1</td> </tr> <tr> <td>9</td> <td>2.606667</td> <td>172.16.67.97</td> <td>172.16.66.195</td> <td>TCP</td> <td>66</td> <td>5160 → 54537 [ACK] Seq=1 Ack=272 Win=13</td> </tr> <tr> <td>10</td> <td>2.610841</td> <td>172.16.67.97</td> <td>172.16.66.195</td> <td>TCP</td> <td>67</td> <td>5160 → 54537 [PSH, ACK] Seq=1 Ack=272</td> </tr> </tbody> </table> <p>▶ Frame 1: 305 bytes on wire (2440 bits), 305 bytes captured (2440 bits) on interface en0, id 0 ▶ Ethernet II, Src: Apple_b6:b5:ce (90:9c:4a:bd:b5:ce), Dst: Broadcast (ff:ff:ff:ff:ff:ff) ▼ Internet Protocol Version 4, Src: 172.16.66.195, Dst: 172.16.66.255</p>	No.	Time	Source	Destination	Protocol	Length	Info	2	1.002922	172.16.66.195	172.16.66.255	UDP	305	54915 → 54915 Len=263	3	2.000680	172.16.66.195	172.16.66.255	UDP	305	54915 → 54915 Len=263	4	2.267823	172.16.66.195	172.16.67.97	TCP	78	54537 → 5160 [SYN] Seq=0 Win=65535 Len=13	5	2.601010	172.16.67.97	172.16.66.195	TCP	78	5160 → 54537 [SYN, ACK] Seq=0 Ack=1 Win=13	6	2.601209	172.16.66.195	172.16.67.97	TCP	66	54537 → 5160 [ACK] Seq=1 Ack=1 Win=13	7	2.602152	172.16.66.195	172.16.67.97	TCP	326	54537 → 5160 [PSH, ACK] Seq=1 Ack=1 Win=13	8	2.602153	172.16.66.195	172.16.67.97	HTTP/...	77	POST /2019067938.html HTTP/1.1	9	2.606667	172.16.67.97	172.16.66.195	TCP	66	5160 → 54537 [ACK] Seq=1 Ack=272 Win=13	10	2.610841	172.16.67.97	172.16.66.195	TCP	67	5160 → 54537 [PSH, ACK] Seq=1 Ack=272
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7. Test Procedure

- A. Write down the name of person that you tested with

Web server owner's name	여주안
Web client owner's name	C

- B. Run wireshark

- C. Send GET Method to Web Server of your group member through your client

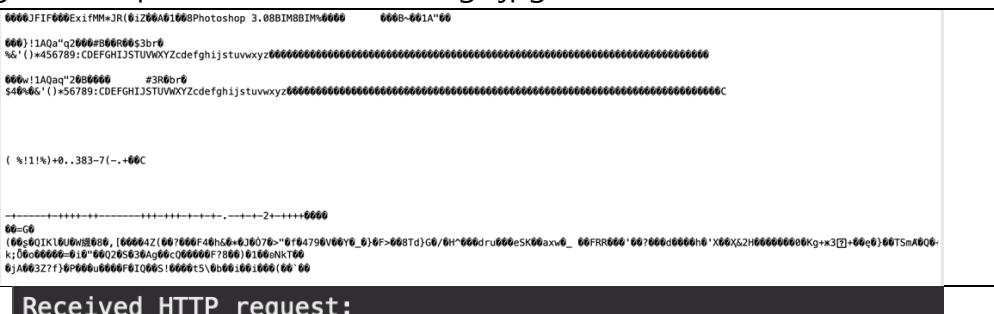
- i. Get studentID.html
(e.g. GET http://127.0.0.1:8080/studentId.html)

Result Screenshot (Client)	<pre><html> <body> KYH SERVER TEST PAGE 1234567890ABC
 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nam bibendum mi suscipit, mattis metus sit amet, elementum enim. Nulla quis suscipit ligula. F Nunc velit elit, egestas non posuere a, hendrerit non enim. Maecenas sed tortor erat. Sed non nulla sapien. Duis accumsan, nisi sed egestas accumsan, m </body> </html></pre>
Result Screenshot (Server)	<pre>Received HTTP request: GET /2017027265.html HTTP/1.1 User-Agent: 2019067938/HYOEUNJEONG/WEBCLIENT/COMPUTERNETWORK Accept: text/html Host: 172.16.66.195:7010 Connection: keep-alive statusLine: HTTP/1.1 200 OK code: OK Sending requested file to client...</pre>

Wireshark Screenshot	8 3.311231 172.16.67.97 172.16.66.195 HTTP 230 GET /2017027265.html HTTP/1.1
	9 3.311304 172.16.66.195 172.16.67.97 TCP 66 [TCP Window Update] 7010 → 4991
	10 3.315601 172.16.66.195 172.16.67.97 TCP 66 7010 → 49912 [ACK] Seq=1 Ack=16
	11 3.322606 172.16.66.195 172.16.67.97 HTTP 67 Continuation
	12 3.322666 172.16.67.97 172.16.66.195 TCP 66 49912 → 7010 [ACK] Seq=165 Ack=
	13 3.412323 172.16.66.195 172.16.67.97 HTTP 1156 Continuation

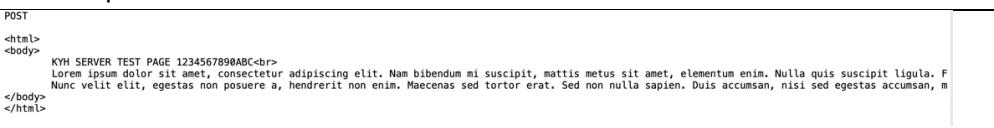
ii. Get image.jpg

(e.g. GET http://127.0.0.1:8080/image.jpg)

Result Screenshot (Client)	
Result Screenshot (Server)	<pre>Received HTTP request: GET /image.jpg HTTP/1.1 User-Agent: 2019067938/HYOEUNJEONG/WEBCLIENT/COMPUTERNETWORK Accept: text/html Host: 172.16.66.195:7010 Connection: keep-alive statusLine: HTTP/1.1 200 OK code: OK Sending requested file to client...</pre>
Wireshark Screenshot	11 1.419712 172.16.67.97 172.16.66.195 HTTP 224 GET /image.jpg HTTP/1.1 12 1.419754 172.16.66.195 172.16.67.97 TCP 66 [TCP Window Update] 7010 13 1.448856 172.16.66.195 172.16.67.97 TCP 66 7010 → 49915 [ACK] Seq=1 14 1.449810 172.16.66.195 172.16.67.97 HTTP 67 Continuation 15 1.449810 172.16.66.195 172.16.67.97 HTTP 1345 Continuation

D. Send POST Method to Web Server of group member through your client

(e.g. POST http://127.0.0.1:8080/studentId.html)

Result Screenshot (Client)	
Result Screenshot (Server)	<pre>Received HTTP request: POST /2017027265.html HTTP/1.1 Content-Type: text/xml; charset=UTF-8 User-Agent: 2019067938/HYOEUNJEONG/WEBCLIENT/COMPUTERNETWORK Accept: text/xml Cache-Control: no-cache Pragma: no-cache Host: 172.16.66.195:7010 Connection: keep-alive Content-Length: 2 statusLine: HTTP/1.1 200 OK code: OK Sending requested file to client...</pre>

Wireshark Screenshot	8 2.903517	172.16.67.97	172.16.66.195	HTTP	330 POST /2017027265.html HTTP/1.1
	9 2.903802	172.16.67.97	172.16.66.195	HTTP	68 Continuation
	10 2.912797	172.16.66.195	172.16.67.97	TCP	66 [TCP Window Update] 7010 → 49933
	11 2.917591	172.16.66.195	172.16.67.97	TCP	66 7010 → 49933 [ACK] Seq=1 Ack=265
	12 2.917591	172.16.66.195	172.16.67.97	TCP	66 7010 → 49933 [ACK] Seq=1 Ack=267
	13 2.921843	172.16.66.195	172.16.67.97	HTTP	67 Continuation
	14 2.921843	172.16.66.195	172.16.67.97	HTTP	1156 Continuation

8. Feeling

다른 기기의 프로그램과 연결되는 것을 보고 보람을 느꼈습니다. 와이어샤크 화면도 짹어야 해서 예상보다 시간이 걸렸지만 마무리를 잘 한 것 같아 좋습니다 😊