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Computer Network
Assignment – 1

Question 1:

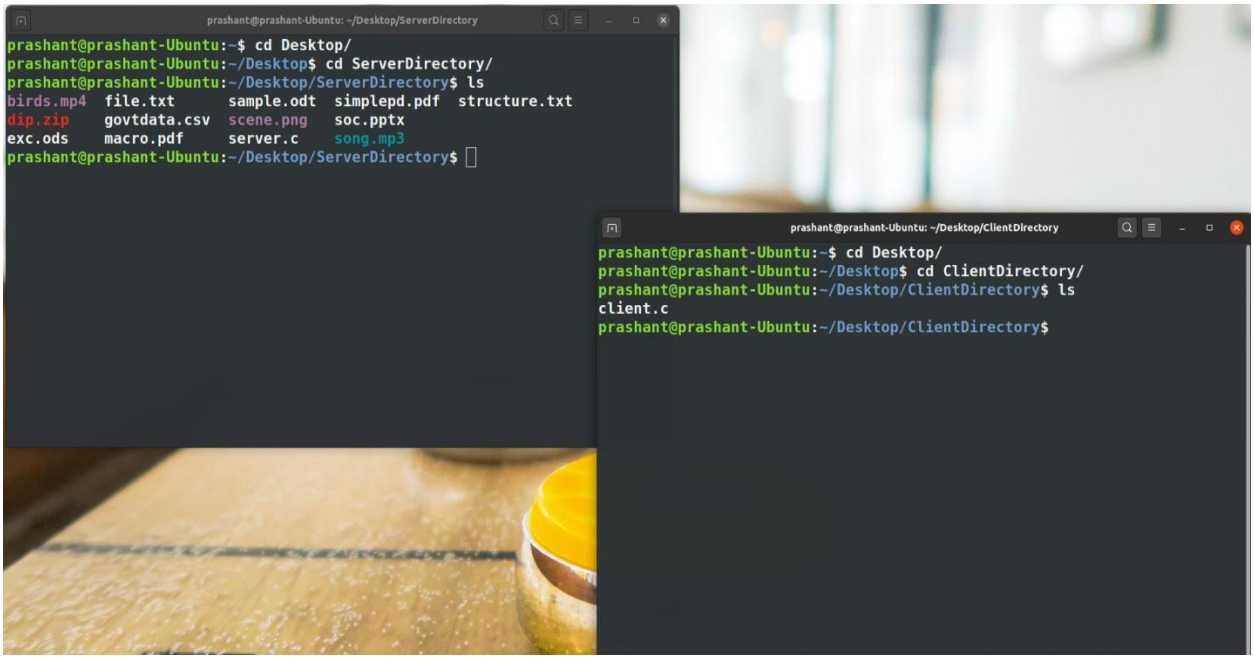
The solution of this problem is totally based on Socket programming (C programming).

The submitted .zip folder contains the file server.c and client.c, and their code explanation is written in the code as a comment.

Here in this document, just a demo of compiling and running of these two files (server.c and client.c) by some screenshots.

Firstly, we have two create two directories, ServerDirectory for server and ClientDirectory for client and also their .c file present in their respective directory.

As we can see in the server directory contains server.c file and some sample files, and client directory contain only client.c



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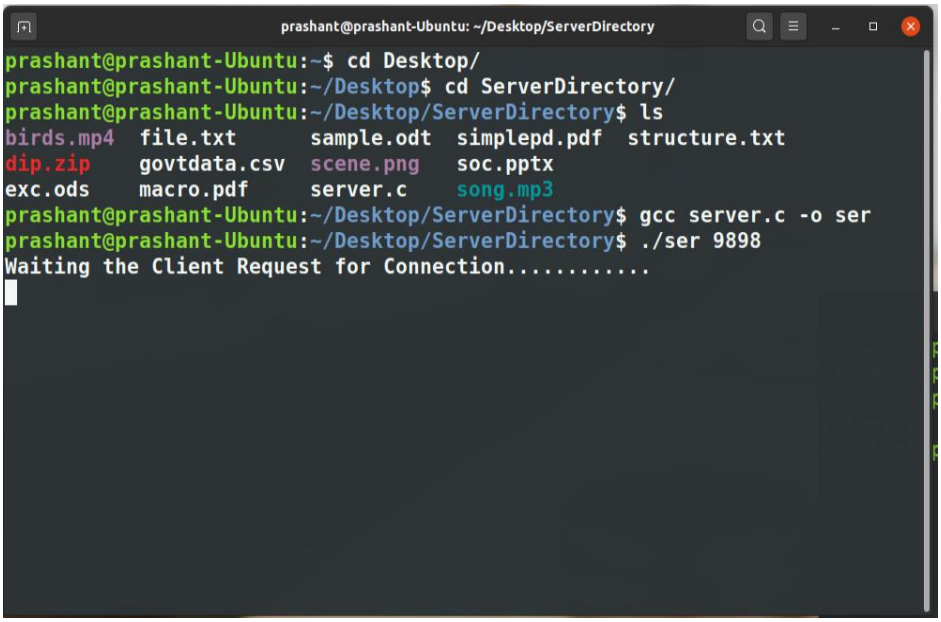
Instruction for Running the server.c

```
This code takes two argument at the time of Running of code
1. Executable file name or may be called as output file name
2. PORT NO. (always takes greater than 5000)

Compiling and Running of an code by example:
gcc server.c -o ser          --- Compiling
./ser 9898                   --- Running
```



Instruction for Running the client.c

```
This code takes three argument at the time of Running of code
1. Executable file name or may be called as output file name
2. IP address of the server (if we are working on same machine then
   enter loopback ip address which is 127.0.0.1 otherwise for different machines
   then enter the server's address)
3. PORT NO. (Just to be make sure that PORT NO. is same as the Server's PORT NO.)

Compiling and Running of an code by example:
gcc client.c -o cl              --- Compiling
./cl 127.0.0.1 9898             --- Running
```

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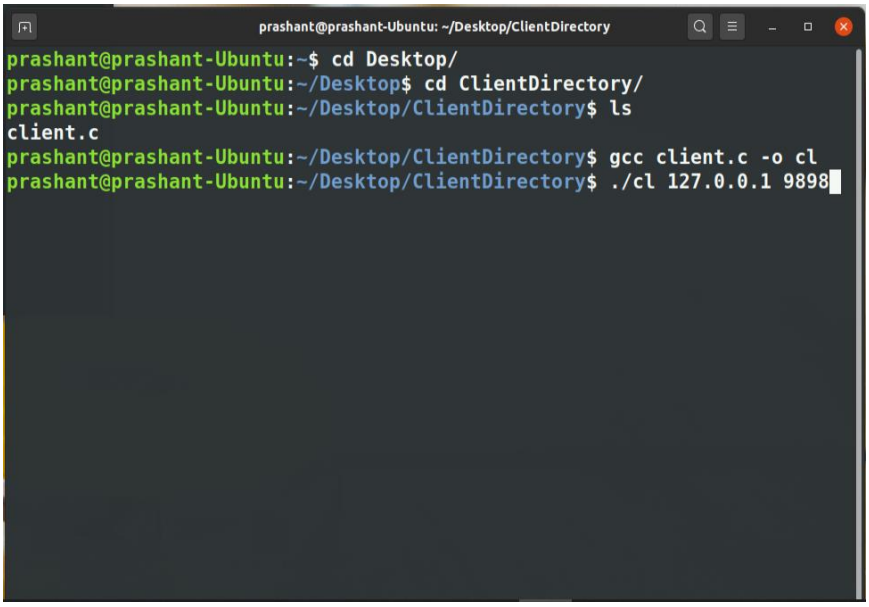
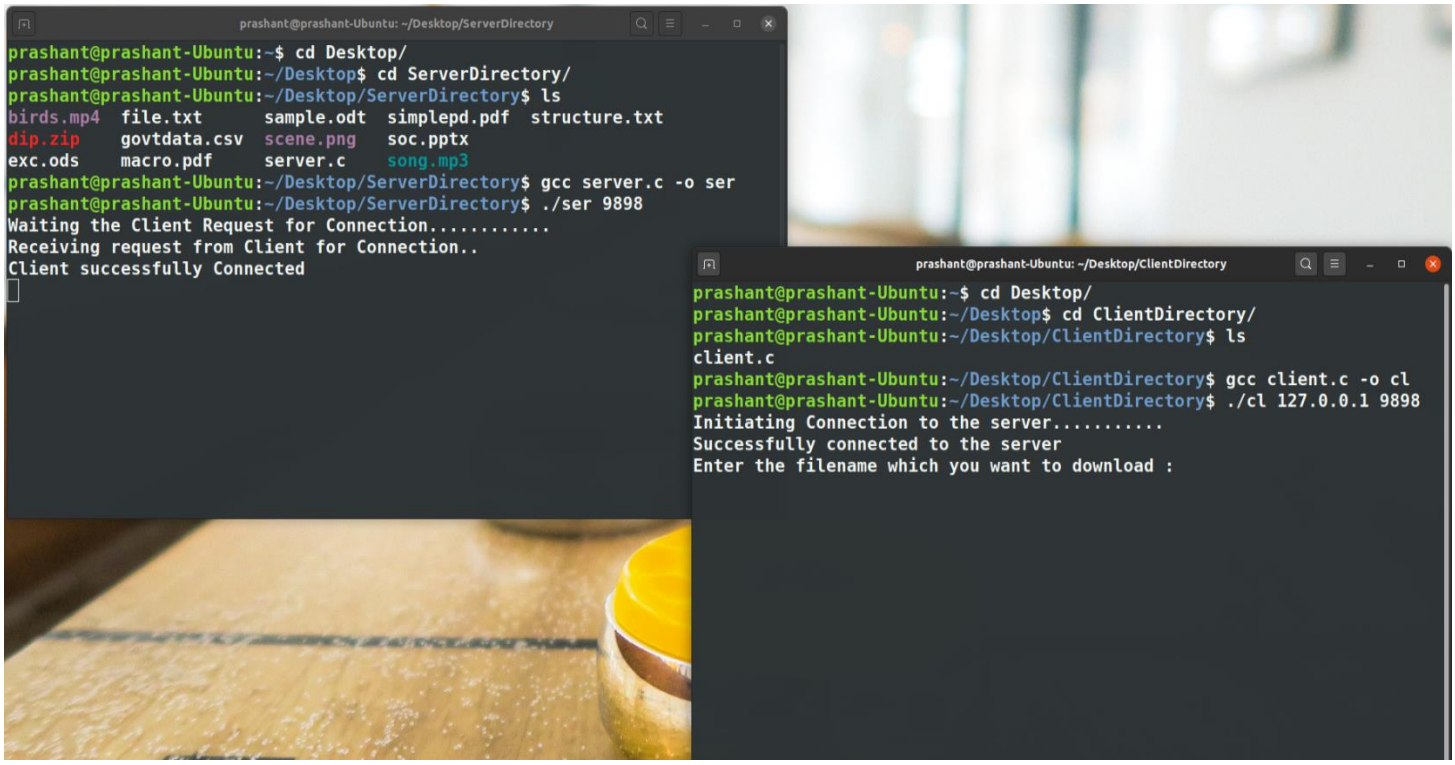


After client connected to the server, client takes the input as filename



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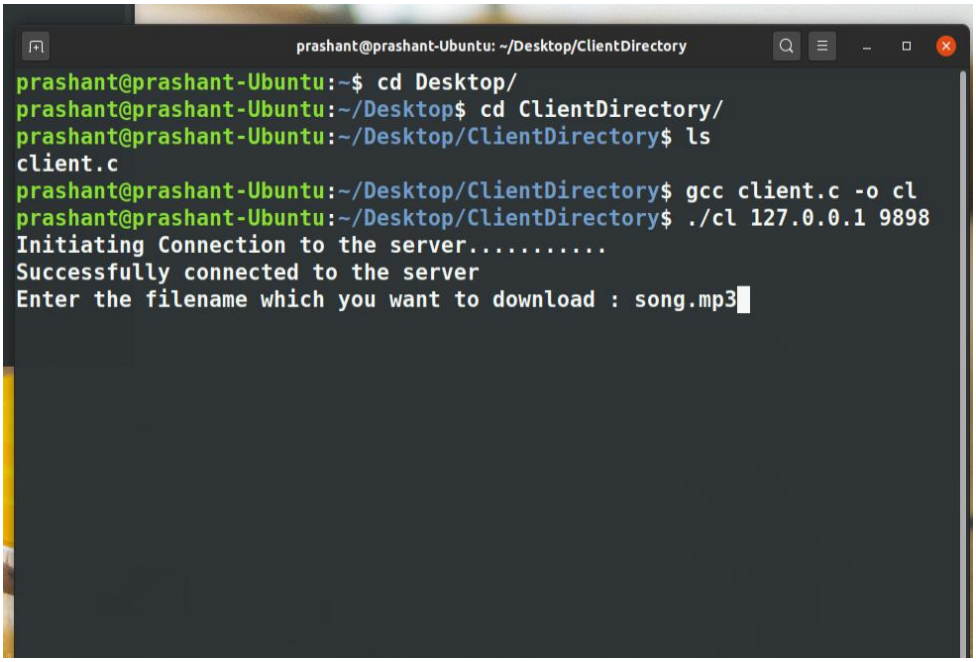
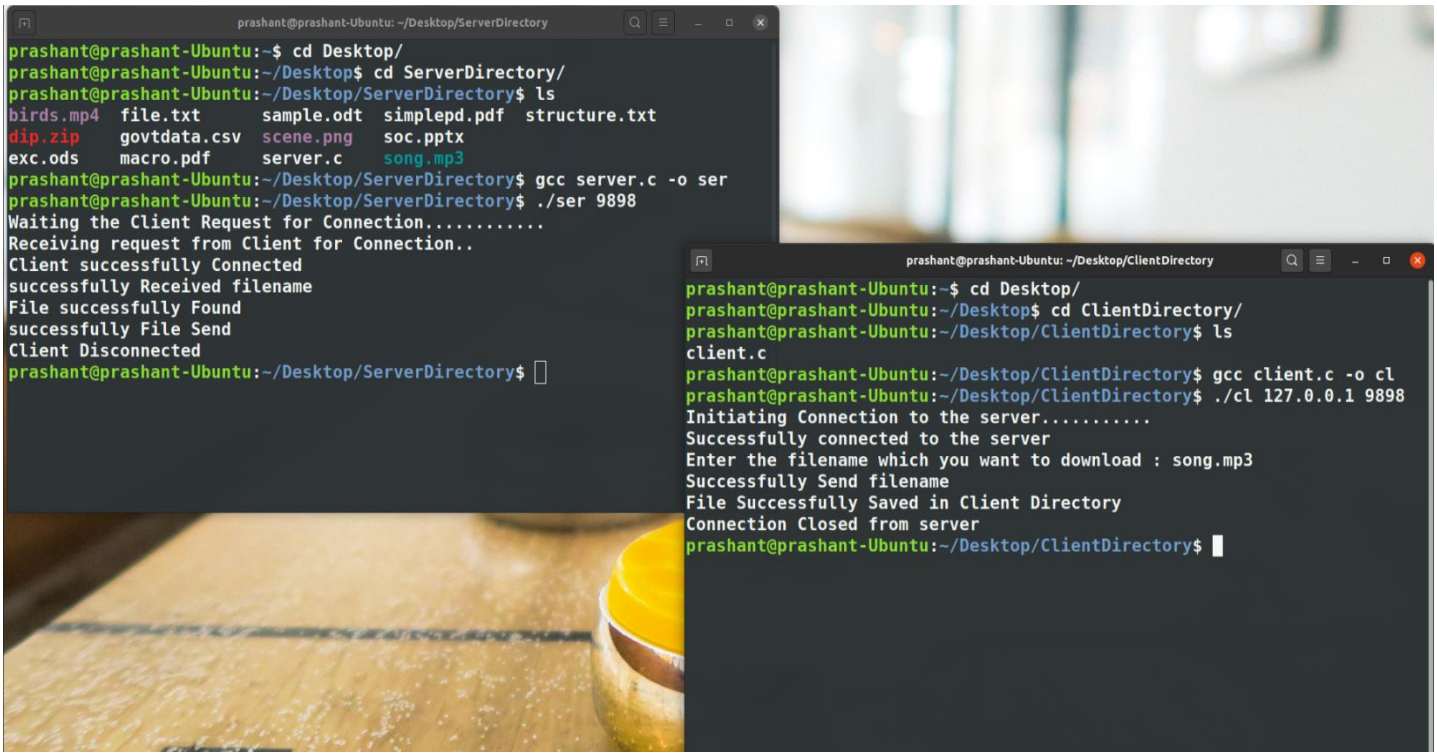
Give the input song.mp3, which is present in the server directory, I'm here just using a .mp3 file for an example, you can use any type of file whether it is .txt, .pdf, .pptx, .csv, .png, .jpeg, .mp4, .zip, etc.



Now, successful message pop out that the server sends the file to the client



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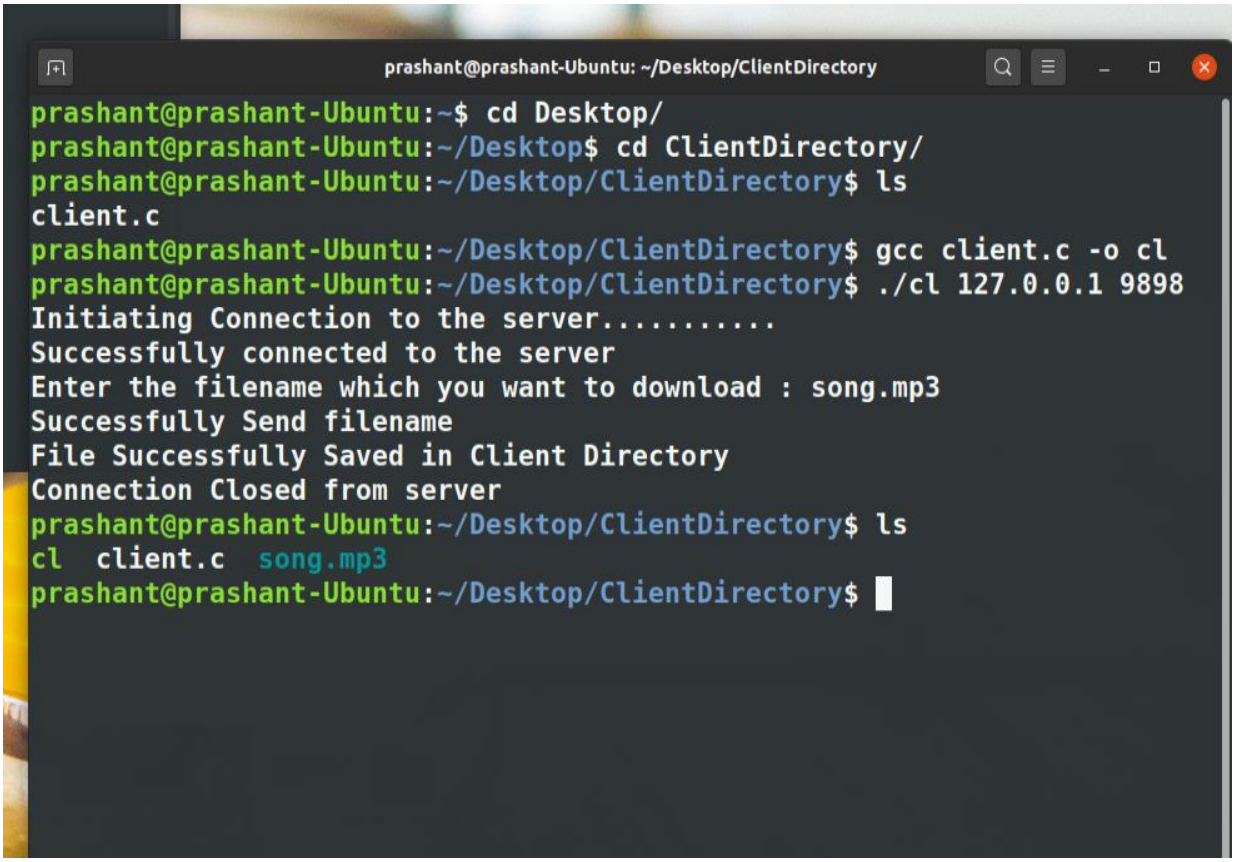
As we can see, Now song.mp3 file is present in local directory of client



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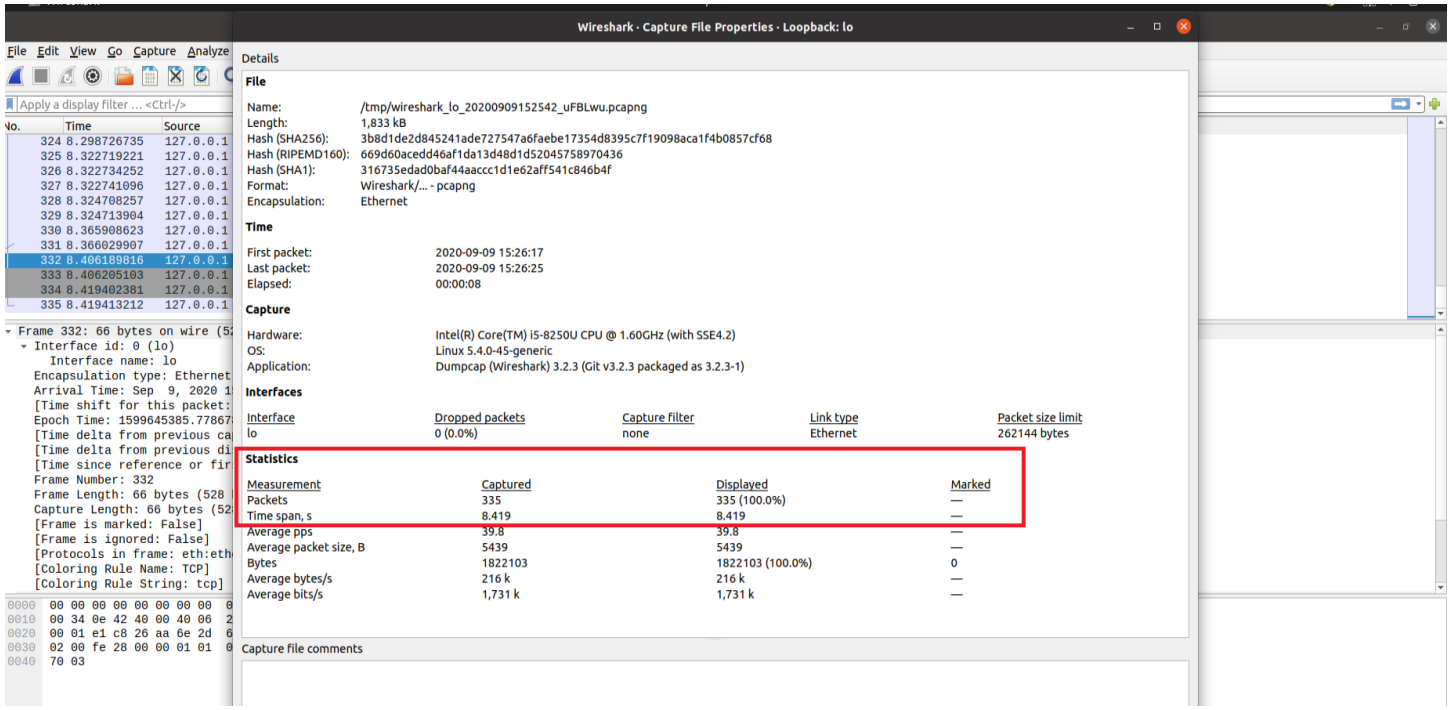
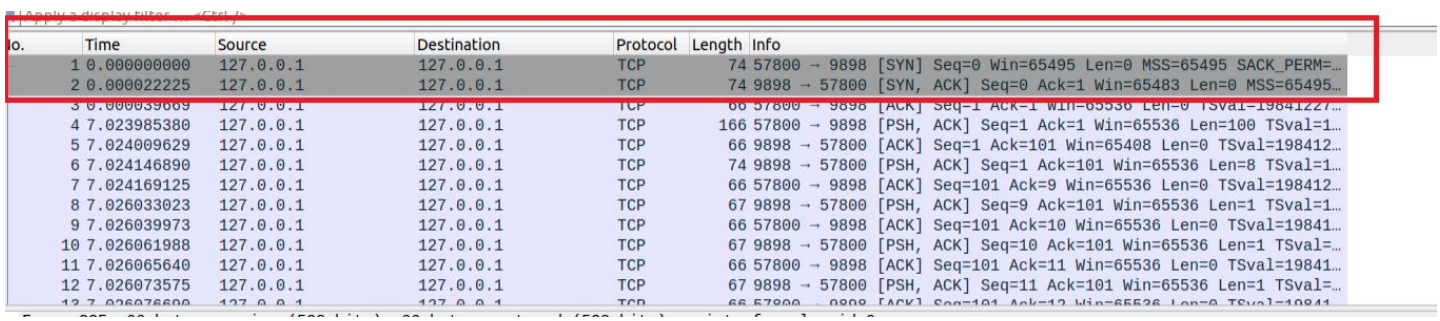
Question 2:





No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000000	127.0.0.1	127.0.0.1	TCP	74	57800 → 9898 [SYN] Seq=0 Win=65495 Len=0 MSS=65495 SACK_PERM=…
2	0.000022225	127.0.0.1	127.0.0.1	TCP	74	9898 → 57800 [SYN, ACK] Seq=0 Ack=1 Win=65483 Len=0 MSS=65495…
3	0.000039669	127.0.0.1	127.0.0.1	TCP	66	57800 → 9898 [ACK] Seq=1 Ack=1 Win=65536 Len=0 TSval=19841227…
4	7.023985380	127.0.0.1	127.0.0.1	TCP	166	57800 → 9898 [PSH, ACK] Seq=1 Ack=1 Win=65536 Len=100 TSval=1…
5	7.024009629	127.0.0.1	127.0.0.1	TCP	66	9898 → 57800 [ACK] Seq=1 Ack=101 Win=65408 Len=0 TSval=198412…
6	7.024146890	127.0.0.1	127.0.0.1	TCP	74	9898 → 57800 [PSH, ACK] Seq=1 Ack=101 Win=65536 Len=8 TSval=1…
7	7.024169125	127.0.0.1	127.0.0.1	TCP	66	57800 → 9898 [ACK] Seq=101 Ack=9 Win=65536 Len=0 TSval=198412…
8	7.026033023	127.0.0.1	127.0.0.1	TCP	67	9898 → 57800 [PSH, ACK] Seq=9 Ack=101 Win=65536 Len=1 TSval=1…
9	7.026039973	127.0.0.1	127.0.0.1	TCP	66	57800 → 9898 [ACK] Seq=101 Ack=10 Win=65536 Len=0 TSval=19841…
10	7.026061988	127.0.0.1	127.0.0.1	TCP	67	9898 → 57800 [PSH, ACK] Seq=10 Ack=101 Win=65536 Len=1 TSval=…
11	7.026065640	127.0.0.1	127.0.0.1	TCP	66	57800 → 9898 [ACK] Seq=101 Ack=11 Win=65536 Len=0 TSval=19841…
12	7.026073575	127.0.0.1	127.0.0.1	TCP	67	9898 → 57800 [PSH, ACK] Seq=11 Ack=101 Win=65536 Len=1 TSval=…
13	7.026076690	127.0.0.1	127.0.0.1	TCP	66	57800 → 9898 [ACK] Seq=101 Ack=12 Win=65536 Len=0 TSval=19841…

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Below are the answers of some questions

Answers:

a) Only 1 TCP connection are made
b) Server PORTNO.: 9898
   Client PORTNO.: 57800
c) Total packet exchange between client & server: 335
d) Total time taken for download the file (in sec): 8.419

I have also attached the packet.csv file in the submitted folder, which contains the packet dissection data from the Wireshark Analysis