

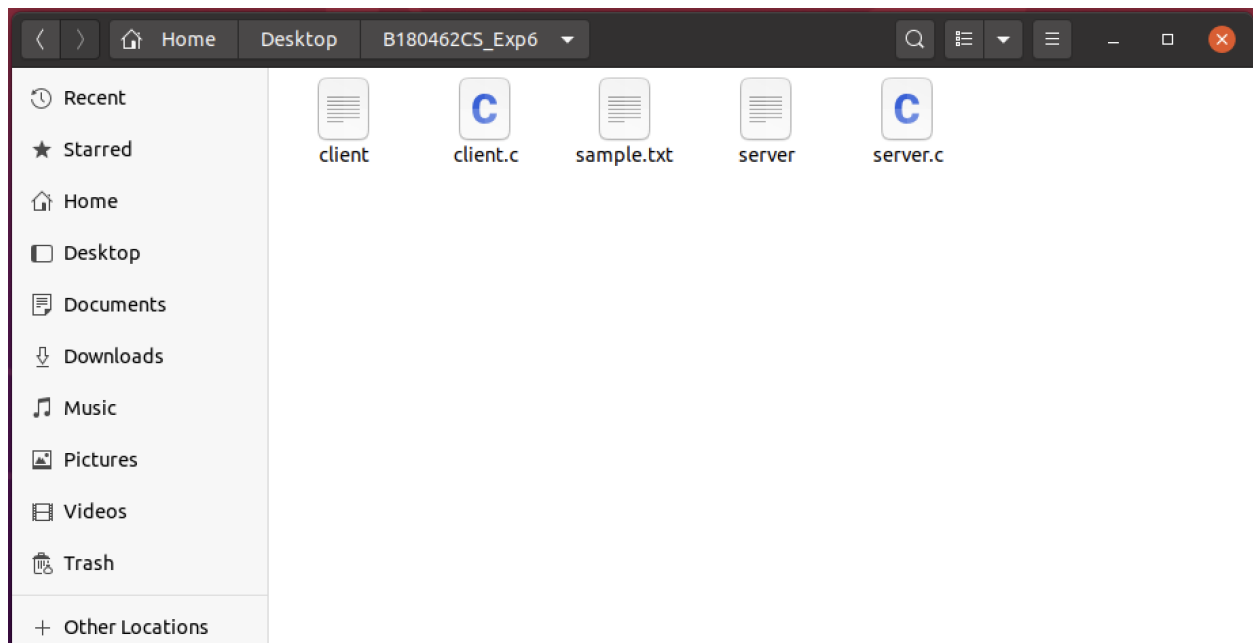
EXPERIMENT 6

Jessiya Joy
B180462CS

There are two source code files in this folder, namely

1. server.c
2. client.c

and a sample 50MB data file “sample.txt”.

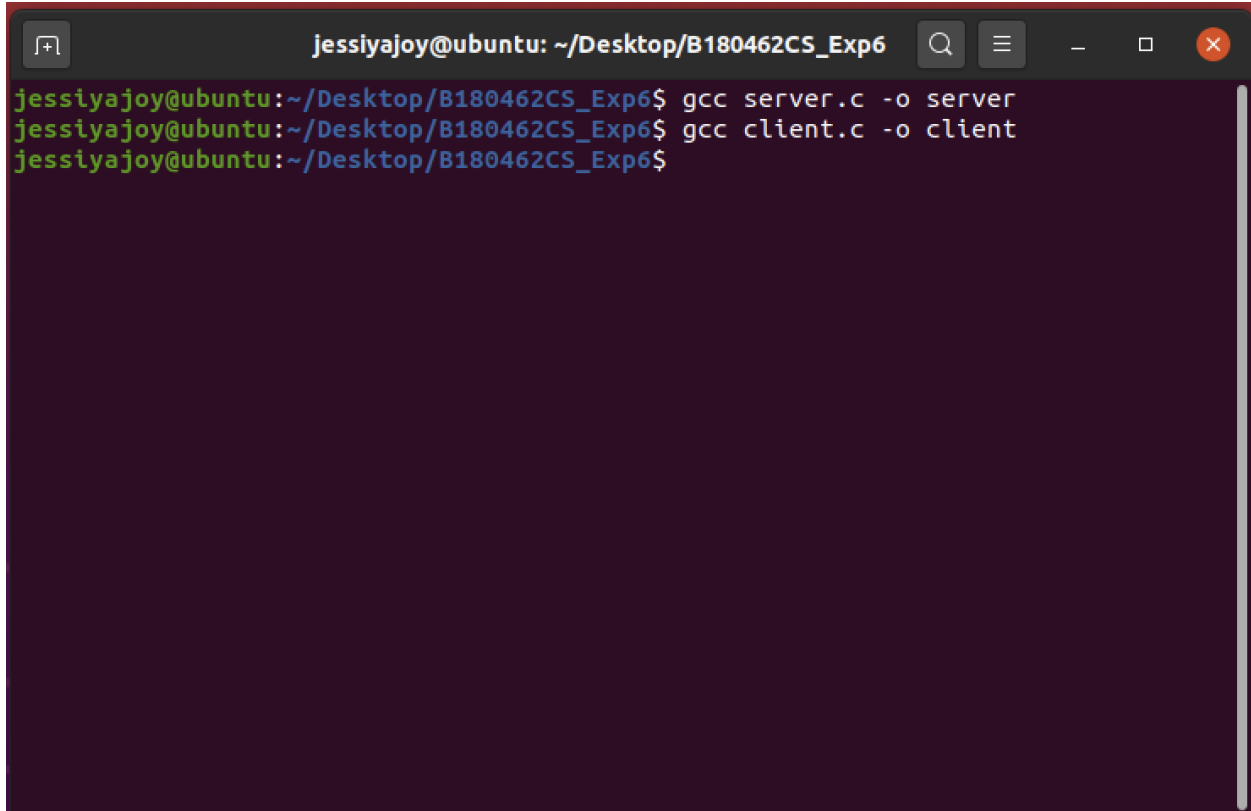


These contain the codes for the implementation of server and client respectively.

Open a terminal in the folder B180462CS_Exp6.

Compile the source code using the following commands:

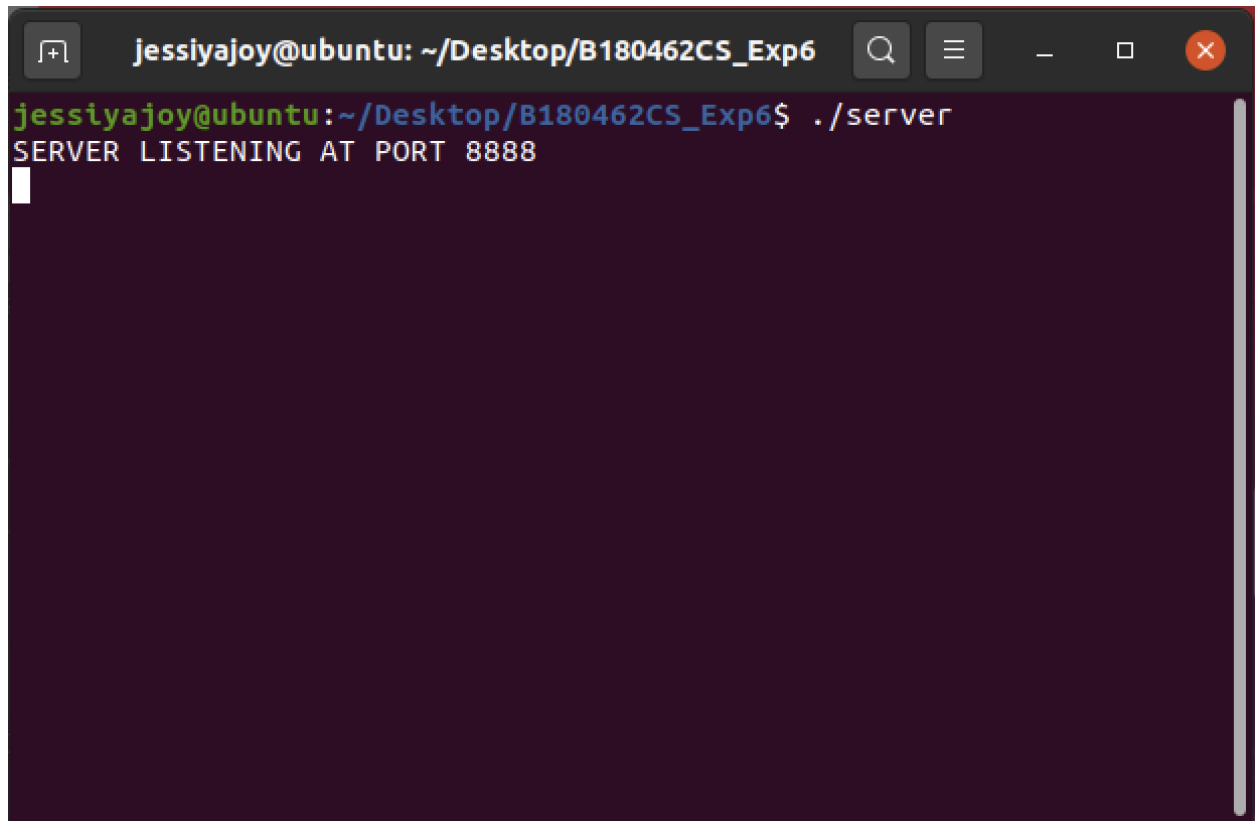
```
gcc tcp_server.c -o server  
gcc tcp_client.c -o client
```

A terminal window with a dark purple background. The title bar at the top reads 'jessiyajoy@ubuntu: ~/Desktop/B180462CS_Exp6'. The terminal shows three lines of text: 'jessiyajoy@ubuntu:~/Desktop/B180462CS_Exp6\$ gcc server.c -o server', 'jessiyajoy@ubuntu:~/Desktop/B180462CS_Exp6\$ gcc client.c -o client', and 'jessiyajoy@ubuntu:~/Desktop/B180462CS_Exp6\$'. The prompt character is green, and the text is white. There are standard window control buttons (minimize, maximize, close) on the right side of the title bar.

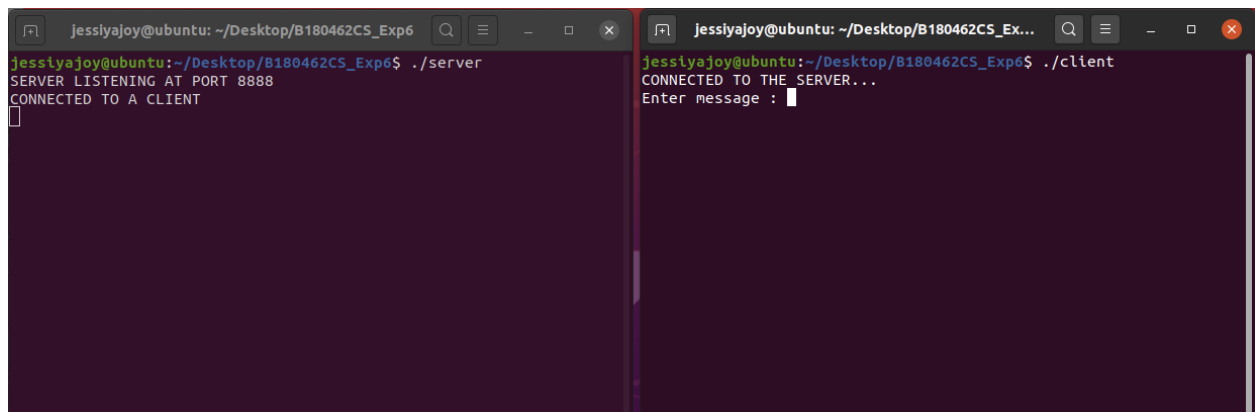
```
jessiyajoy@ubuntu: ~/Desktop/B180462CS_Exp6  
jessiyajoy@ubuntu:~/Desktop/B180462CS_Exp6$ gcc server.c -o server  
jessiyajoy@ubuntu:~/Desktop/B180462CS_Exp6$ gcc client.c -o client  
jessiyajoy@ubuntu:~/Desktop/B180462CS_Exp6$
```

Now run the executable files for the server followed by the client in a new terminal as follows :

```
./server  
./client
```

A terminal window titled 'jessiyajoy@ubuntu: ~/Desktop/B180462CS_Exp6'. The prompt is 'jessiyajoy@ubuntu:~/Desktop/B180462CS_Exp6\$'. The user has entered './server', and the output is 'SERVER LISTENING AT PORT 8888'.

```
jessiyajoy@ubuntu:~/Desktop/B180462CS_Exp6$ ./server
SERVER LISTENING AT PORT 8888
```

Two terminal windows side-by-side. The left window shows the server output: 'SERVER LISTENING AT PORT 8888' followed by 'CONNECTED TO A CLIENT'. The right window shows the client output: 'CONNECTED TO THE SERVER...' followed by 'Enter message :'.

```
jessiyajoy@ubuntu:~/Desktop/B180462CS_Exp6$ ./server
SERVER LISTENING AT PORT 8888
CONNECTED TO A CLIENT

jessiyajoy@ubuntu:~/Desktop/B180462CS_Exp6$ ./client
CONNECTED TO THE SERVER...
Enter message :
```

In the terminal running the client program , enter any message to send to the server.

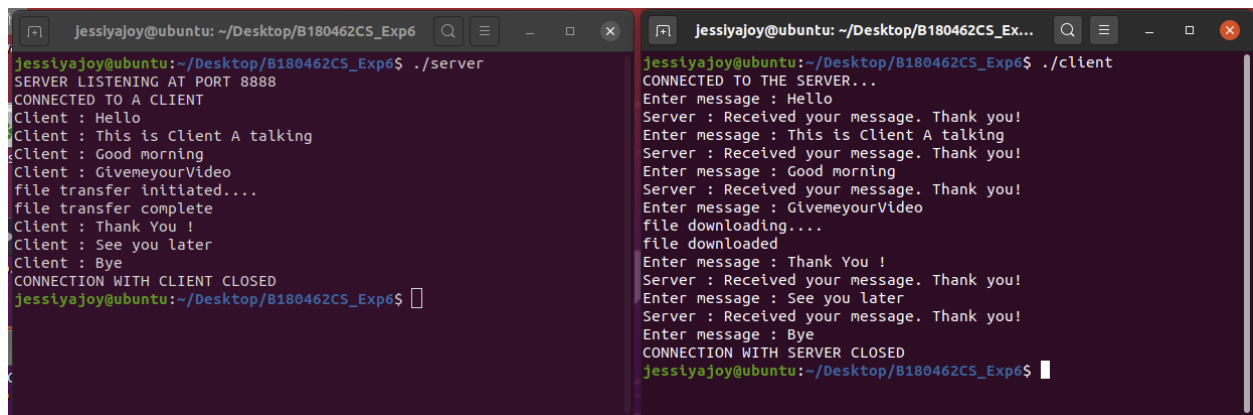
The server receives the message and responds accordingly :

1. Client message : “GivemeyourVideo”
Server sends a 50MB data file to the client.
2. Client message : “Bye”

Server closes the connection with the client.

3. To any other message, the server responds with a default message
“Received your message. Thank you!”

Sample Run :



```
jessiyajoy@ubuntu: ~/Desktop/B180462CS_Exp6$ ./server
SERVER LISTENING AT PORT 8888
CONNECTED TO A CLIENT
Client : Hello
Client : This is Client A talking
Client : Good morning
Client : GivemeyourVideo
file transfer initiated...
file transfer complete
Client : Thank You !
Client : See you later
Client : Bye
CONNECTION WITH CLIENT CLOSED
jessiyajoy@ubuntu:~/Desktop/B180462CS_Exp6$

jessiyajoy@ubuntu:~/Desktop/B180462CS_Exp6$ ./client
CONNECTED TO THE SERVER...
Enter message : Hello
Server : Received your message. Thank you!
Enter message : This is Client A talking
Server : Received your message. Thank you!
Enter message : Good morning
Server : Received your message. Thank you!
Enter message : GivemeyourVideo
file downloading....
file downloaded
Enter message : Thank You !
Server : Received your message. Thank you!
Enter message : See you later
Server : Received your message. Thank you!
Enter message : Bye
CONNECTION WITH SERVER CLOSED
jessiyajoy@ubuntu:~/Desktop/B180462CS_Exp6$
```

After execution , 2 new files will be present in the folder :

1. download.txt : file that is received by the client
2. transmission_rates.txt : file that contains the recorded transmission rates during the data file transfer between client and server.

GNU PLOT :

Install gnuplot on a linux machine as follows :

```
sudo apt-get update
```

```
sudo apt-get install gnuplot-qt
```

Open a terminal window in the same folder and launch a gnuplot command line interface as shown below :

```
jessiyajoy@ubuntu: ~/Desktop/B180462CS_Exp6
jessiyajoy@ubuntu:~/Desktop/B180462CS_Exp6$ gnuplot

G N U P L O T
Version 5.2 patchlevel 8    last modified 2019-12-01

Copyright (C) 1986-1993, 1998, 2004, 2007-2019
Thomas Williams, Colin Kelley and many others

gnuplot home:      http://www.gnuplot.info
faq, bugs, etc:    type "help FAQ"
immediate help:    type "help" (plot window: hit 'h')

Terminal type is now 'qt'
gnuplot> set grid
gnuplot> set style line 1 \
>linecolor rgb '#0061ad' \
> linetype 1 linewidth 2 \
>pointtype 7 pointsize 1
gnuplot> set title "TRANSMISSION RATES DURING FILE TRANSFER OF 50MB DATA FILE"
gnuplot> set xlabel "Time (in seconds)"
gnuplot> set ylabel "Transmission Rate (in mbps)"
gnuplot> plot "transmission_rates.txt" using 1:2 with linespoints linestyle 1
```

The transmission rates during file transfer in the sample run were :

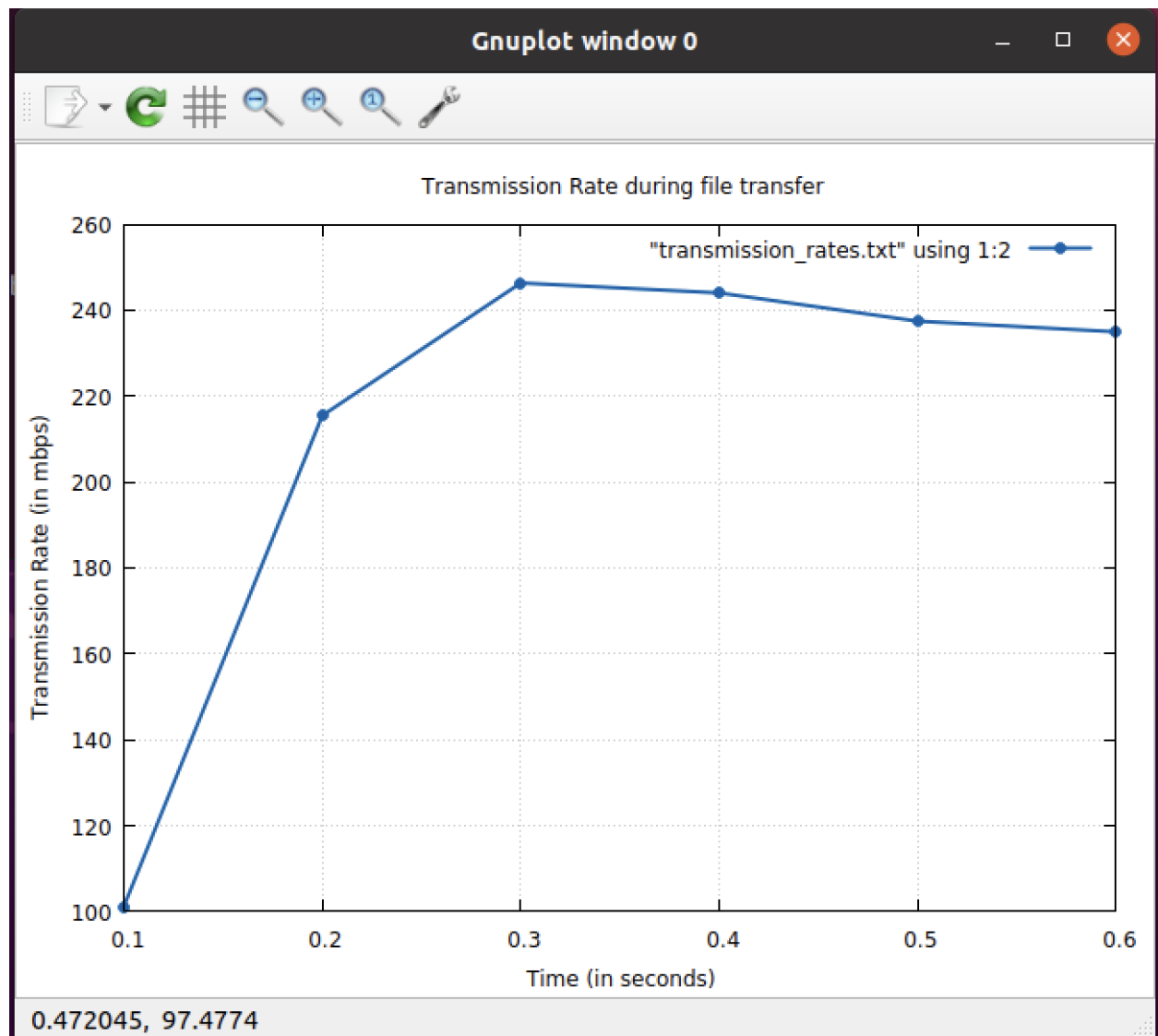
50MB data file :

```
transmission_rates.txt
~/Desktop/B180462CS_Exp6

1 0.100000 101.208415
2 0.200000 215.457245
3 0.300000 246.327545
4 0.400000 244.002342
5 0.500000 237.412453
6 0.600000 234.918594

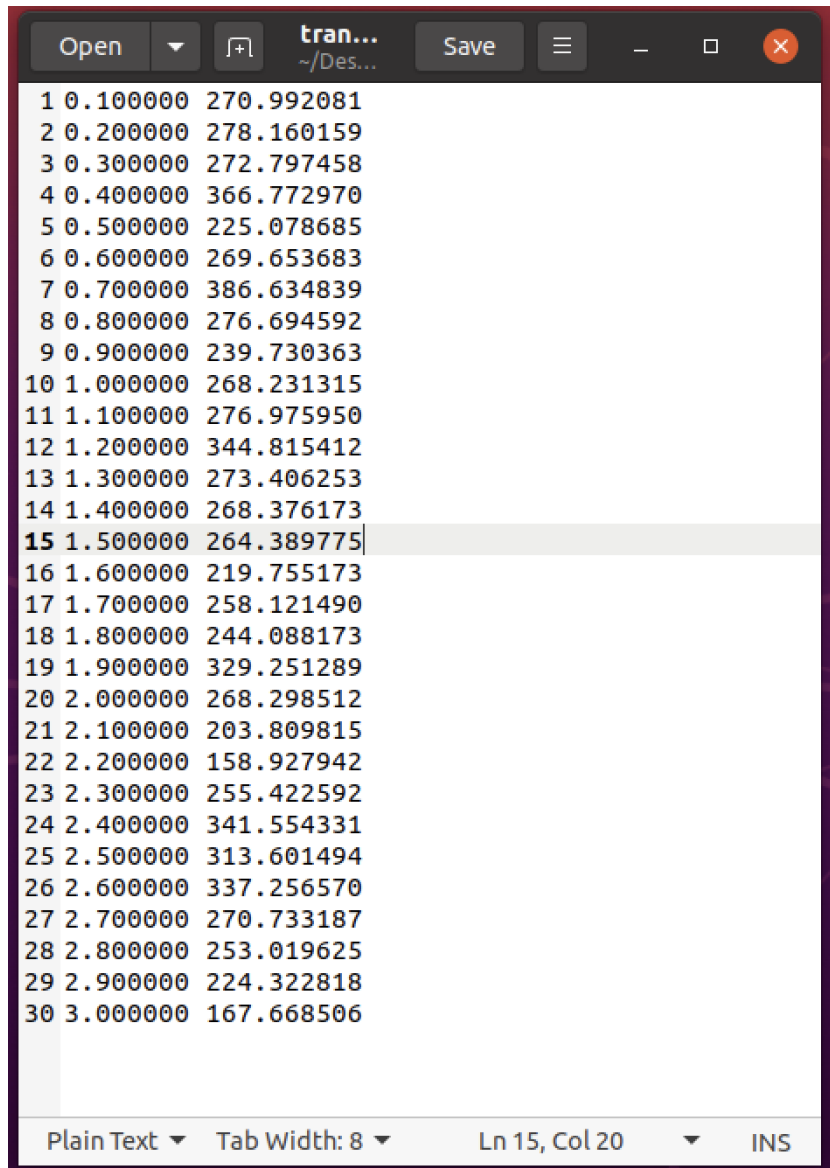
Plain Text ▾ Tab Width: 8 ▾ Ln 1, Col 1 ▾ INS
```

Transmission rates during 50MB data file transfer



Transmission rates during 50MB data file transfer

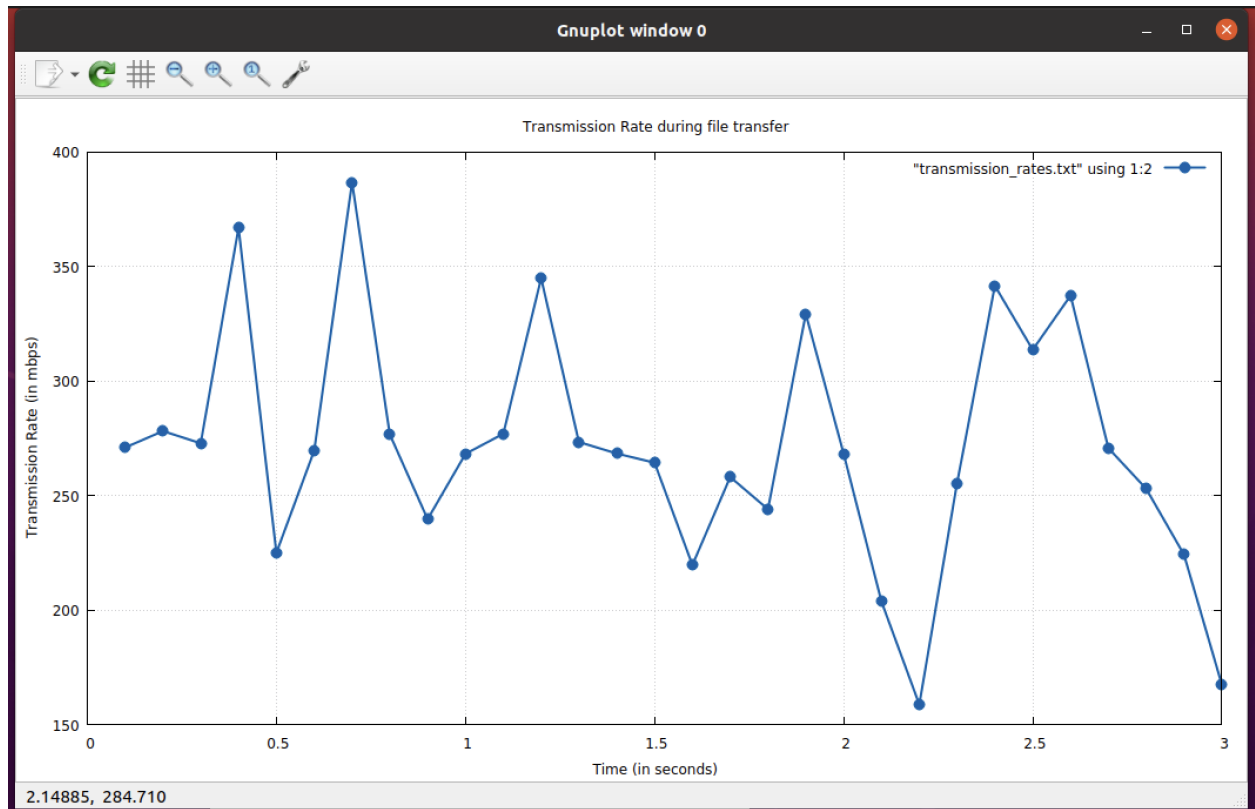
200MB Data File :



The image shows a screenshot of a text editor window. The title bar at the top reads "tran..." and the file path is "~/Des...". The editor contains a table with 30 rows. Each row has three columns: a line number (1-30), a time value (e.g., 0.100000), and a rate value (e.g., 270.992081). The row with line number 15 is highlighted. The status bar at the bottom indicates "Plain Text", "Tab Width: 8", "Ln 15, Col 20", and "INS".

1	0.100000	270.992081
2	0.200000	278.160159
3	0.300000	272.797458
4	0.400000	366.772970
5	0.500000	225.078685
6	0.600000	269.653683
7	0.700000	386.634839
8	0.800000	276.694592
9	0.900000	239.730363
10	1.000000	268.231315
11	1.100000	276.975950
12	1.200000	344.815412
13	1.300000	273.406253
14	1.400000	268.376173
15	1.500000	264.389775
16	1.600000	219.755173
17	1.700000	258.121490
18	1.800000	244.088173
19	1.900000	329.251289
20	2.000000	268.298512
21	2.100000	203.809815
22	2.200000	158.927942
23	2.300000	255.422592
24	2.400000	341.554331
25	2.500000	313.601494
26	2.600000	337.256570
27	2.700000	270.733187
28	2.800000	253.019625
29	2.900000	224.322818
30	3.000000	167.668506

Transmission rates during 280MB data file transfer



Transmission rates during 280MB data file transfer