YouTube demo: https://youtu.be/KxdSiwPA_cw

1. Request data points:

1.1 Request person 10, at time 0, the value of ECG1 and ECG2:

```
osboxes@osboxes:~/CSCE313/PA1$ ./client -p 10 -t 0.000 -e 1
For person 10, at time 0, the value of ecg 1 is -0.415
Client-side is done and exited
Server terminated
osboxes@osboxes:~/CSCE313/PA1$ ./client -p 10 -t 0.000 -e 2
For person 10, at time 0, the value of ecg 2 is -0.18
Client-side is done and exited
Server terminated
osboxes@osboxes:~/CSCE313/PA1$
```

1.2 Request person 10, 1000 data points:

```
osboxes@osboxes:~/CSCE313/PA1$ ./client -p 10 -n 1000
Number of data points: 1000
Time consumption is: 6 seconds
Client-side is done and exited
Server terminated
```

1.3 Compare x1.csv with 10_first1K.csv:

```
osboxes@osboxes:~/CSCE313/PA1$ cmp x1.csv 10_first1K.csv
osboxes@osboxes:~/CSCE313/PA1$
```

2. Request files:

2.1 Request 10.csv file, compare the received file with the original file:

```
osboxes@osboxes:~/CSCE313/PA1$ cmp x1.csv 10_first1K.csv
osboxes@osboxes:~/CSCE313/PA1$ ./client -f 10.csv
File length: 289955 bytes
Time consumption is: 29032 microseconds
Client-side is done and exited
Server terminated
osboxes@osboxes:~/CSCE313/PA1$
```

2.2 Request 100.dat, 256.dat and 1000.dat files:

```
osboxes@osboxes:~/CSCE313/PA1$ ./client -f 100.dat
File length: 100 bytes
Time consumption is: 1008 microseconds
Client-side is done and exited
Server terminated
osboxes@osboxes:~/CSCE313/PA1$ ./client -f 256.dat
File length: 256 bytes
Time consumption is: 1126 microseconds
Client-side is done and exited
Server terminated
osboxes@osboxes:~/CSCE313/PA1$ ./client -f 1000.dat
File length: 1000 bytes
Time consumption is: 1991 microseconds
Client-side is done and exited
Server terminated
osboxes@osboxes:~/CSCE313/PA1$
```

2.3 Compare the received files with the original files:

```
osboxes@osboxes:~/CSCE313/PA1$ diff ./received/100.dat ./BIMDC/100.dat
osboxes@osboxes:~/CSCE313/PA1$ diff ./received/256.dat ./BIMDC/256.dat
osboxes@osboxes:~/CSCE313/PA1$ diff ./received/1000.dat ./BIMDC/1000.dat
osboxes@osboxes:~/CSCE313/PA1$
```

2.4 Request 10MB.dat file, 100MB.dat file and 200MB.dat file, compare them with the original files:

```
osboxes@osboxes:~/CSCE313/PA1$ ./client -f 10MB.dat
File length: 10000000 bytes
Time consumption is: 991245 microseconds
Client-side is done and exited
Server terminated
osboxes@osboxes:~/CSCE313/PA1$ ./client -f 100MB.dat
File length: 100000000 bytes
Time consumption is: 9.54026e+06 microseconds
Client-side is done and exited
Server terminated
osboxes@osboxes:~/CSCE313/PA1$ ./client -f 200MB.dat
File length: 200000000 bytes
Time consumption is: 1.88697e+07 microseconds
Client-side is done and exited
Server terminated
osboxes@osboxes:~/CSCE313/PA1$ diff ./received/10MB.dat ./BIMDC/10MB.dat
osboxes@osboxes:~/CSCE313/PA1$ diff ./received/100MB.dat ./BIMDC/100MB.dat
osboxes@osboxes:~/CSCE313/PA1$ diff ./received/200MB.dat ./BIMDC/200MB.dat
osboxes@osboxes:~/CSCE313/PA1$
```

2.5 After changing the buffer capacity to **5000** bytes, redo transferring the 10MB, 100MB.dat and 200MB.dat files:

```
osboxes@osboxes:~/CSCE313/PA1$ ./client -f 10MB.dat -m 5000
File length: 10000000 bytes
Time consumption is: 87015 microseconds
Client-side is done and exited
Server terminated
osboxes@osboxes:~/CSCE313/PA1$ ./client -f 100MB.dat -m 5000
File length: 100000000 bytes
Time consumption is: 784083 microseconds
Client-side is done and exited
Server terminated
osboxes@osboxes:~/CSCE313/PA1$ ./client -f 200MB.dat -m 5000
File length: 200000000 bytes
Time consumption is: 1.51771e+06 microseconds
Client-side is done and exited
Server terminated
osboxes@osboxes:~/CSCE313/PA1$
```

2.6 After changing the buffer capacity to **50000** bytes, redo transferring the 10MB, 100MB.dat and 200MB.dat files:

```
osboxes@osboxes:~/CSCE313/PA1$ ./client -f 10MB.dat -m 50000
File length: 10000000 bytes
Time consumption is: 22087 microseconds
Client-side is done and exited
Server terminated
osboxes@osboxes:~/CSCE313/PA1$ ./client -f 100MB.dat -m 50000
File length: 100000000 bytes
Time consumption is: 235934 microseconds
Client-side is done and exited
Server terminated
osboxes@osboxes:~/CSCE313/PA1$ ./client -f 200MB.dat -m 50000
File length: 200000000 bytes
Time consumption is: 433849 microseconds
Client-side is done and exited
Server terminated
osboxes@osboxes:~/CSCE313/PA1$
```

2.7 The main bottleneck is the buffer capacity, when set the limit of each transfer in both client.cpp and server.cpp, the time consumption declines much. For example, about the 100MB file, the transferring time can decline from 9.54 seconds to 0.78 seconds.

2.8 With the m value increasing, the time consumption decreases. Because, if the m value increases, which means we need less times to request files. (i.e. the value of fileLength/m decreases)

3. Request a new channel:

Create a new channel and request person 2, at time 0, the value of ecg 1:

```
osboxes@osboxes:~/CSCE313/PA1$ ./client -c 1
new channel created
For person 2, at time 0, the value of ecg 1 is -0.485
new channel closed
Client-side is done and exited
Server terminated
Client-side is done and exited
osboxes@osboxes:~/CSCE313/PA1$
```