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Programming Assignment # 2 Report

Design

This program was designed using a simple server, client relationship. The server and the client communicated through a control channel which data was both written to and read by the server and client functions of the program.

To test this server/ client relationship, three methods of obtaining data from the server were constructed. The first method utilized the retrieval of single data points from the server through the control channel. This was accomplished using a for loop that went through the entire 1.csv file and wrote the output to x1.csv.

The next method of data retrieval implemented gathered data from the server using a series of file messages. This method was more efficient in its data collection because it allowed larger of chunks of data to be collected for each request, having a max message return of 256 bytes. This method of data retrieval utilized a while loop to go through the 1.csv file and write the data collected to y1.csv.

The final method of data retrieval created in this assignment read binary data and re-copied the data to an output binary file. Similar to the implementation of the file message retrieval, the binary dta retrieval method utilized a while loop to go through a binary file and used the fwrite() function to write the binary data to an output file.

All methods for data retrieval were successful in reading and writing the exact file contents from the request channel. The accuracy of these data retrieval methods mere tested using the diff command within terminal.

The largest file that the binary data retrieval method was able to process was a 1 gig file. All files larger than 1 gig that I attempted to test were not able to be written to an output file. I was not able to get my program to work with the 5 GB file.

I believe that this bottleneck is caused by the fact that the CPU on my machine did not have enough resources to allocate to the processing of a single 5GB file. I also believe that the bottleneck could be caused by the time it takes to open a 5GB file. Because opening this file takes a long time, the program does not recognize that the file is open and simply skips over the processing of this data without actually seeing it.

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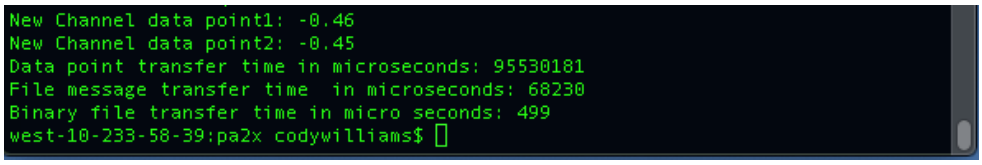
The transfer time is able to be changed by varying the size of the binary file. Below are some examples of varied sizes of binary files that have different transfer times. Generally speaking, larger files had larger transfer times.

Time for data point transfer of 1.csv



Time for file message transfer of 1.csv

```
New Channel data point1: -0.46
New Channel data point2: -0.45
Data point transfer time in microseconds: 95530181
File message transfer time  in microseconds: 68230
Binary file transfer time in micro seconds: 499
west-10-233-58-39:pa2x codywilliams$
```

Time for transfer of binary file size 1024 bytes

```
New Channel data point1: -0.46
New Channel data point2: -0.45
Data point transfer time in microseconds: 95530181
File message transfer time  in microseconds: 68230
Binary file transfer time in micro seconds: 499
west-10-233-58-39:pa2x codywilliams$
```

Time for transfer of binary file size 10k

```
Server received request for file BIMDC/bin10k
Server received request for file BIMDC/bin10k
Server received request for file BIMDC/bin10k
Binary file transfer time in micro seconds: 3060
```

Time for transfer of binary file size 1M

```
Server received request for file BIMDC/bin1m
Server received request for file BIMDC/bin1m
Server received request for file BIMDC/bin1m
Binary file transfer time in micro seconds: 265343
west-10-233-58-39:pa2x codywilliams$ _
```

Time for transfer of binary file size 1g

```
Server received request for file BIMDC/bin1g
Server received request for file BIMDC/bin1g
Server received request for file BIMDC/bin1g
Server received request for file BIMDC/bin1g
Server received request for file BIMDC/bin1g
Server received request for file BIMDC/bin1g
New Channel data point1: -0.46
New Channel data point2: -0.45
Part 3 time in microseconds: 277742683
west-10-233-58-39:pa2x codywilliams$
```