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Project 4 || System & Networks I

Due By: 11/5/2016

Runtime Experiment

Below you will see the results of 4 different type of runs. In the program that you will see there are four different functions that are called to do each of the actions. writeToCol writes in order by column pattern. Vice versa the writeToRow does it by rows. This was achieved using two loops. Pseudocode is below to example more. From the results, which will also be displayed below in 4 tables and 4 charts you can see that the column write/read is more expensive on timing then the row write/read. This should be due to page faults that occurs.

Pseudocode 1

```
For  i < ROW_AMOUNT
        For j < COL_AMOUNT
                Arr[i][j]
```

This allows for us to write to each row as I will hold till all 4096 positions of each row are assigned/read

Pseudocode 2

```
For i < COL_AMOUNT
        for j < ROW_AMOUNT
                Arr[j][i]
```

This is the method used to access by column. It will traverse down 20480 each time then move over each column by 1.

Below you will see the two different environments I ran it in and the two gcc options. For one set I used a Ubuntu based in a virtual machine. One set of runs were done with gcc optimization on and one set was done with gcc optimization off. Same for the SSH server. Each of the "Runs" was one run of the program so it was an average of 10 iterations. All time is based off seconds (S).

Ubuntu VM(gcc optimize off)				
	Run 1	Run 2	Run 3	Average
Write C	1.2475	1.2506	1.238	1.2454
Write R	0.2818	0.2858	0.2818	0.2831
Read C	0.6473	0.6533	0.6492	0.6499
Read R	0.2374	0.2356	0.2358	0.2363

Ubuntu VM(gcc optimize on)				
	Run 1	Run 2	Run 3	Average
Write C	1.2413	1.2512	1.256	1.2495
Write R	0.2788	0.2823	0.2842	0.2818
Read C	0.6444	0.6456	0.6423	0.6441
Read R	0.234	0.2357	0.2319	0.2339

SSH Server(gcc optimize off)				
	Run 1	Run 2	Run 3	Average
Write C	4.9488	4.9347	4.9435	4.9423
Write R	0.7913	0.7953	0.7983	0.7950
Read C	3.3874	3.3880	3.3761	3.3838
Read R	0.6627	0.6557	0.6444	0.6543

SSH Server(gcc optimize on)				
	Run 1	Run 2	Run 3	Average
Write C	4.9465	4.9524	4.9633	4.9541
Write R	0.7934	0.7946	0.7956	0.7945
Read C	3.3972	3.3769	3.3910	3.3884
Read R	0.6467	0.6482	0.6537	0.6495

Below is a display of the bar charts comparison given you a visual view of each table above.