Assignment #4

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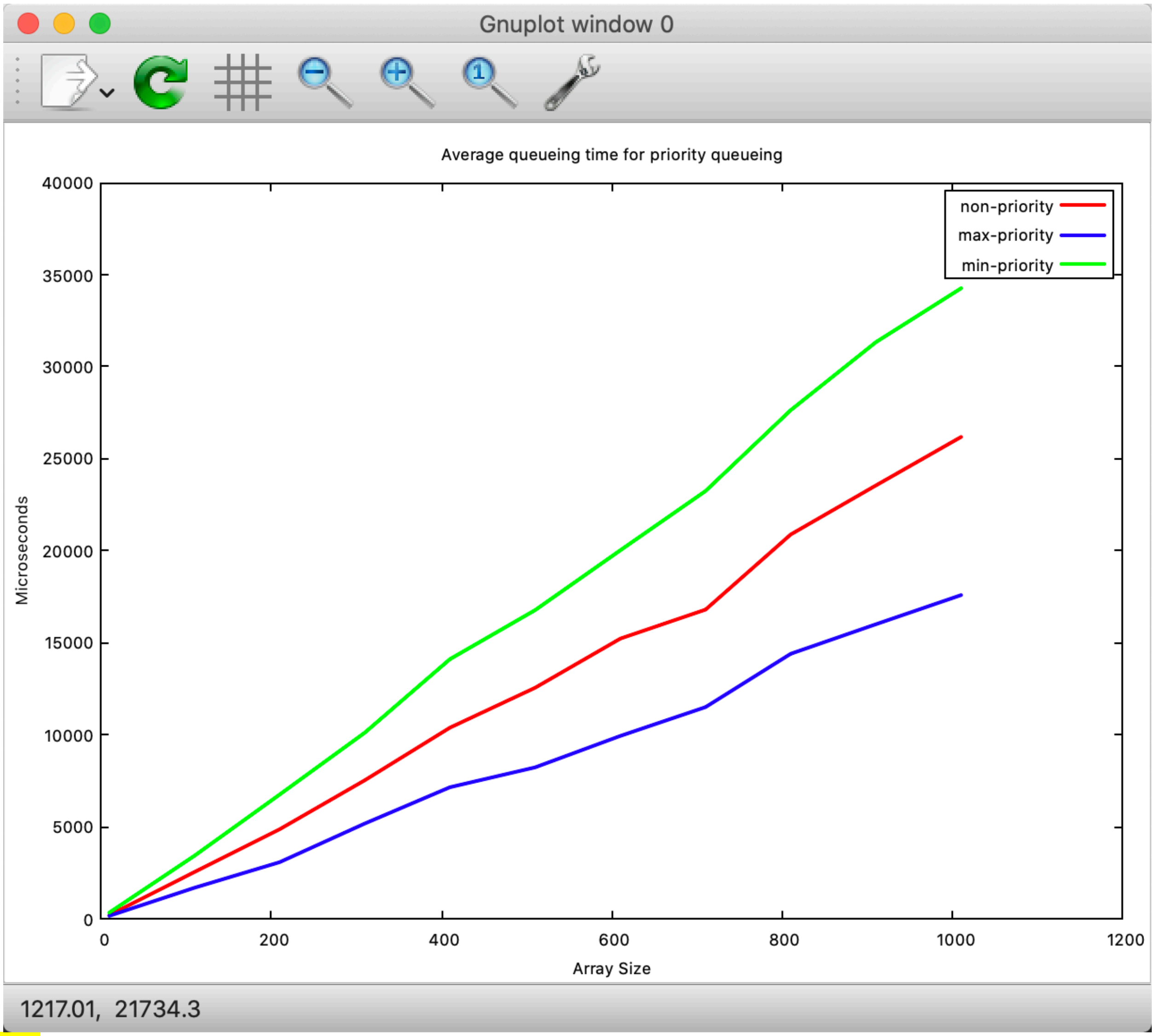
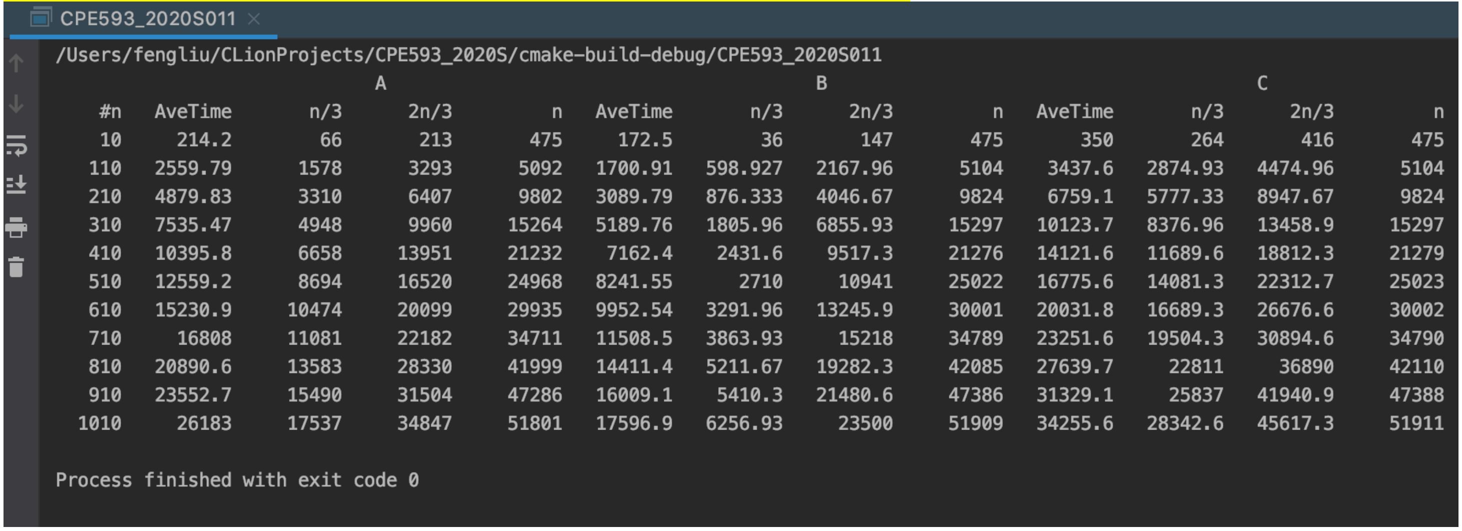


Gnuplot:

```
set xlabel "Array size"
set ylabel "Microseconds"
set yrange[0:40000]
set key right top
set key box
set key spacing 1.5
plot "LiuF_4.dat" using 1:2 with lines lw 2 lc "red" title “non-priority”, "1.dat" using 1:6 with lines lw 2 lc "pink" title “max-priority”, "1.dat" using 1:10 with lines lw 2 lc "blue" title “min-priority”
```

The output of my code(same as the file LiuF_4.dat):



```
/Users/fengliu/CLionProjects/CPE593_2020S/cmake-build-debug/CPE593_2020S011
                             A                                       B                                       C
    #n   AveTime       n/3      2n/3         n   AveTime       n/3      2n/3         n   AveTime       n/3      2n/3         n
    10     214.2        66       213       475     172.5        36       147       475       350       264       416       475
   110   2559.79      1578      3293      5092   1700.91   598.927   2167.96      5104    3437.6   2874.93   4474.96      5104
   210   4879.83      3310      6407      9802   3089.79   876.333   4046.67      9824    6759.1   5777.33   8947.67      9824
   310   7535.47      4948      9960     15264   5189.76   1805.96   6855.93     15297   10123.7   8376.96   13458.9     15297
   410   10395.8      6658     13951     21232    7162.4    2431.6    9517.3     21276   14121.6   11689.6   18812.3     21279
   510   12559.2      8694     16520     24968   8241.55      2710     10941     25022   16775.6   14081.3   22312.7     25023
   610   15230.9     10474     20099     29935   9952.54   3291.96   13245.9     30001   20031.8   16689.3   26676.6     30002
   710     16808     11081     22182     34711   11508.5   3863.93     15218     34789   23251.6   19504.3   30894.6     34790
   810   20890.6     13583     28330     41999   14411.4   5211.67   19282.3     42085   27639.7     22811     36890     42110
   910   23552.7     15490     31504     47286   16009.1    5410.3   21480.6     47386   31329.1     25837   41940.9     47388
  1010     26183     17537     34847     51801   17596.9   6256.93     23500     51909   34255.6   28342.6   45617.3     51911

Process finished with exit code 0
```

My observation from data and from the plots:

Average queueing time of array B is the least. And when the elements number is the maxium, the waiting time of 3 arrays almost same. So do the job in the order of max-priority is the most efficient.

From the data and the plot, quick sorting is really an excellent algorithm.