Performance evaluation project
Parallel Quick Sort

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1. Introduction:

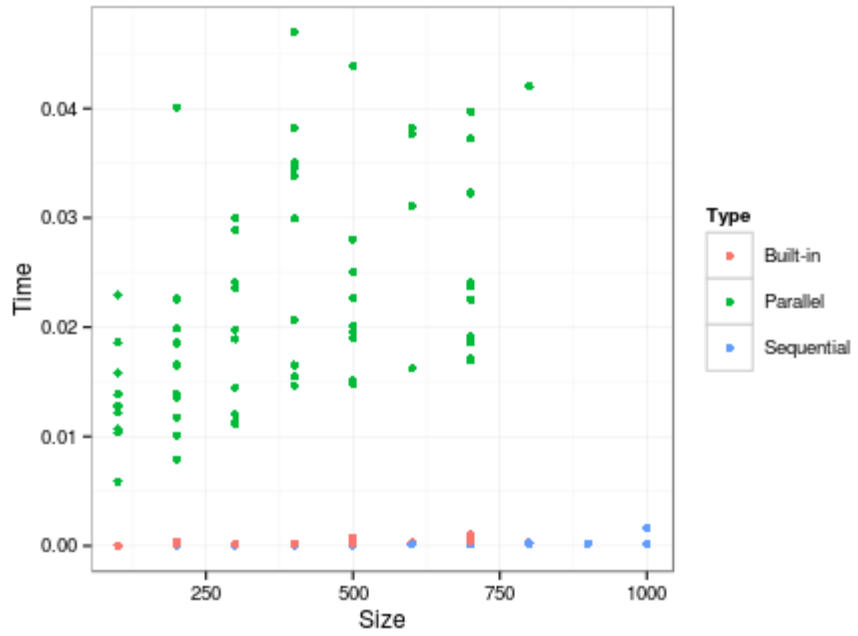
The experiment compares the performance of parallel quick sort algorithm with a sequential algorithm and a built in one.

In this work I first kept the parameters of the algorithm as they were written and ran the algorithm for some experiments then I changed the depth of the algorithm from 10 to 2.

The results showed the when the depth is 10 the parallel and built-algorithms don't work and the programs gives error after the size of the list exceeds 700 nodes.

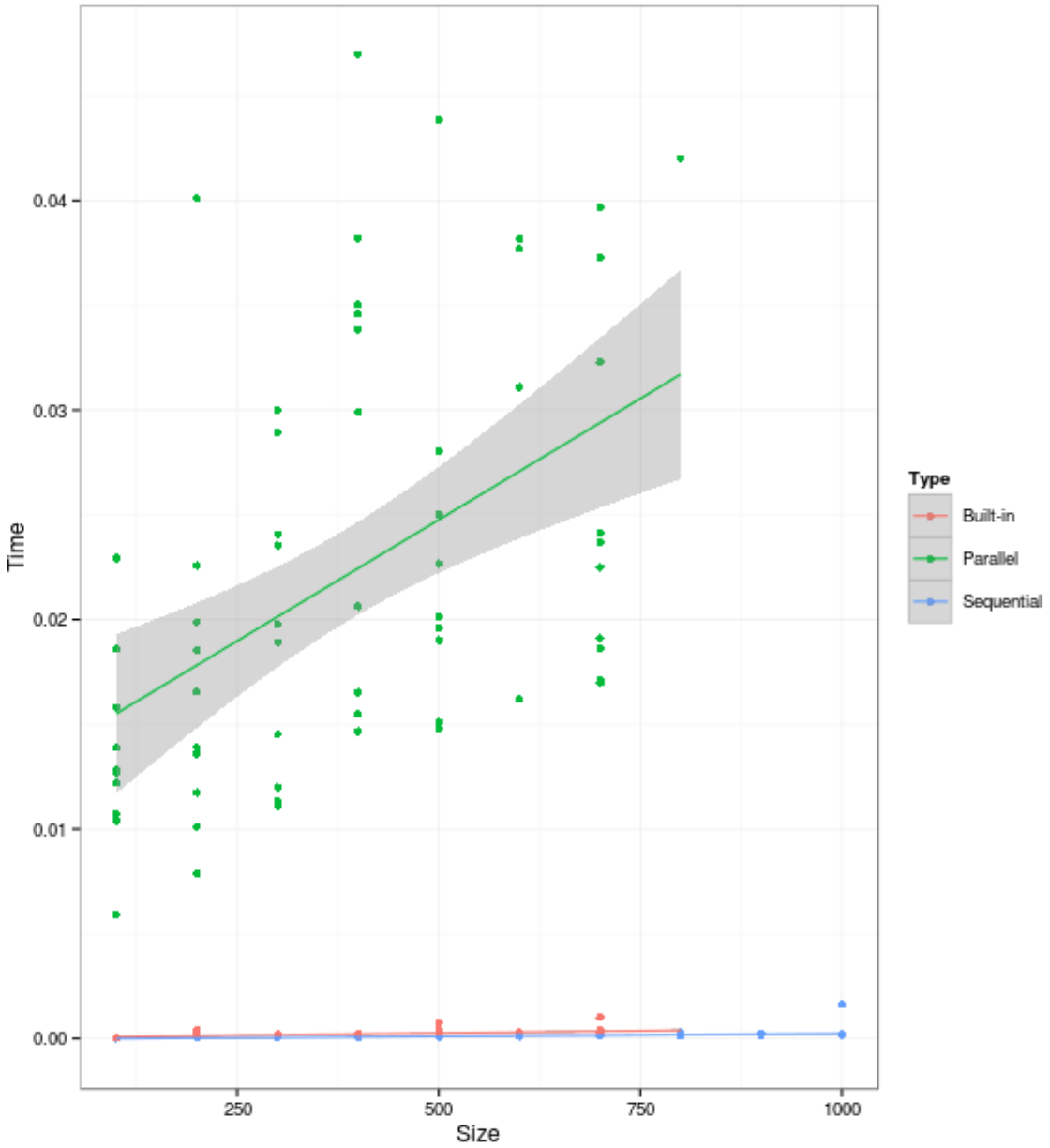
2. First experiment:

By running the run_benchmark.sh for a range between 100 to 1000 and each size repeated 5 times I plotted the Time as a function of the Size and the Type is separated between Sequential and parallel and built in as shown in figure.



Using the command

ggplot(data = testmeas,aes(x=Size,y= Time,color=Type))+ geom_point() +theme_bw()+ geom_smooth(method="lm")



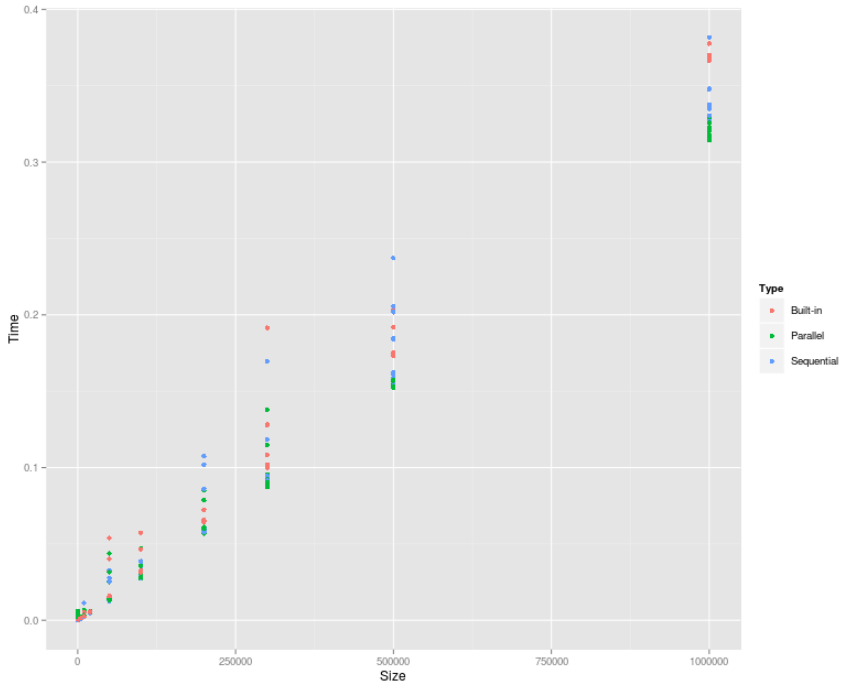
What I understand is that the parallel algorithm takes longer time than sequential algorithm and this is because here the size f the list is relatively small and using the depth = 10 increases the overhead, distributing the load on the threads which will slow the work while there is no need.

3. Experiment 2:

Back to the parallelQuicksort, I tried to change the number of the THREAD_LEVEL and make equal to 2. And recompiled the code and executed it for different range.

This time I used the a range from 100 to 1000000 going through some points and repeated the experiment 10 times instead of 5. Here I got rid of the ERROR of thread 11.

Then with ggplot I have this p.



The command:

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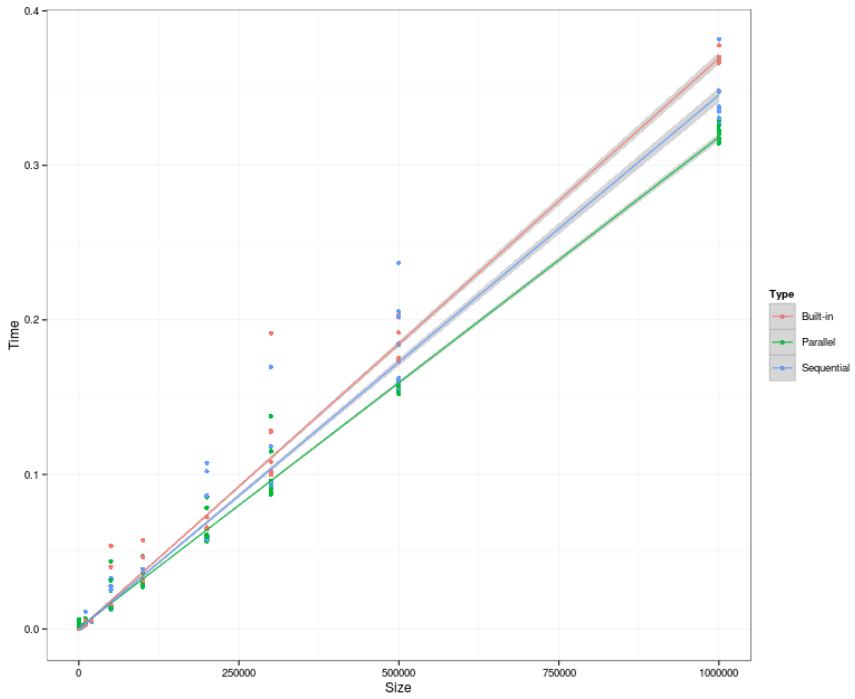

4. Challenges:

Some packages like Factors, I couldn't install them on my machine because the Rstudio version is old and it was only one compatible with my machine.

I had less time to dig in the lectures and understand how to code in Rstudio so to bring the linear model and other statics.