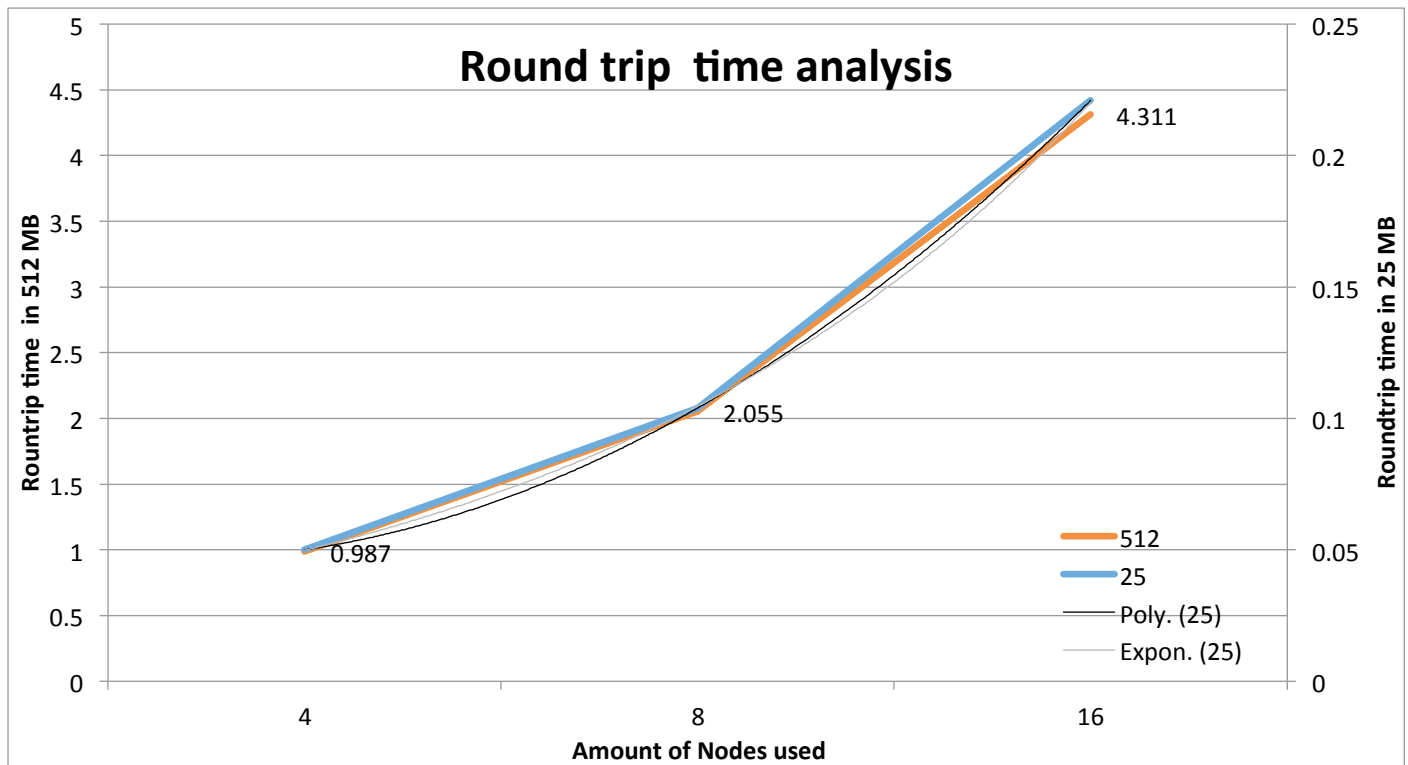


## M78 Assignment 1 – MPI section

### Result



### Discussion

After gathering the outputs from the merry-go-round program, the data is displayed in the above shown graph, with additional information to visually aid in this discussion.

firstly despite the different scaling, for both lines, we can see in their own respective scale, both perform similarly to each other, with the difference in round trip, which is to be expected as more data to process, no matter the amount of nodes used would increase the time it takes to complete the increased amount of data.

Bearing in mind the small sample size restricts any accurate predictions thus the following statement is merely speculation. It was discovered, by initially observing the graph, the performance time seemed to be increasing in polynomial time thus it was possible for the performance of the merry-go-round program to be  $O(n)^2$ , however after integrating a couple of trend lines with varying trend patterns, it was discovered that the initial assumption of the program being  $O(n^2)$  (shown in black) could be wrong, as the 2<sup>nd</sup> trend line is shown to be a better fit, meaning the data is possibly exponential increasing making the program's performance possibly be in  $O(n^i)$ .

In either case, the performance of the program is costly in computational power.