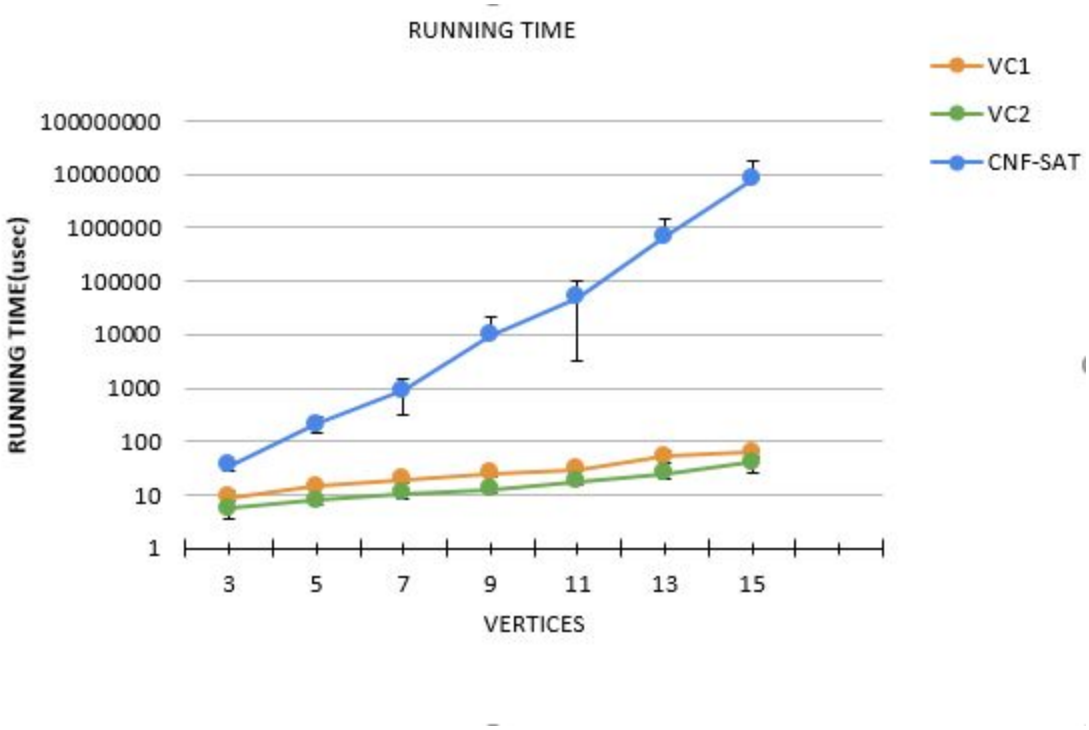
REPORT ANALYSIS



RUNNING TIME(microseconds)

The vertical axis shows the logarithmic scale for running time whereas horizontal axis shows the number of vertices.
The running time for CNF-SAT-VC is higher than APPROX-VC1 and APPROX-VC2, mainly due to increased complexity as the number of clauses are more and minisat is used to generate optimised vertex cover.
The running time for APPROX VC1 is greater than that of APPROX VC2, as the former has the complexity of N^2 while the later has that of N, for generating vertex cover.
The vertical yerror bars show the standard deviation which indicate the extent of deviation from the mean.

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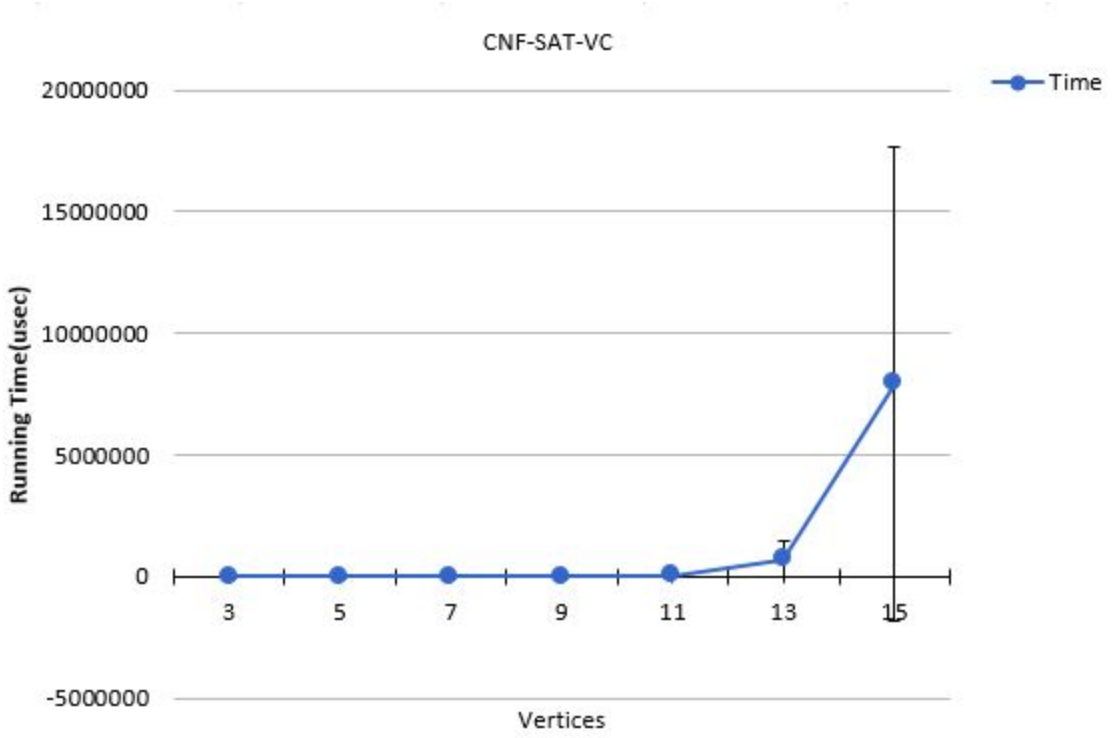
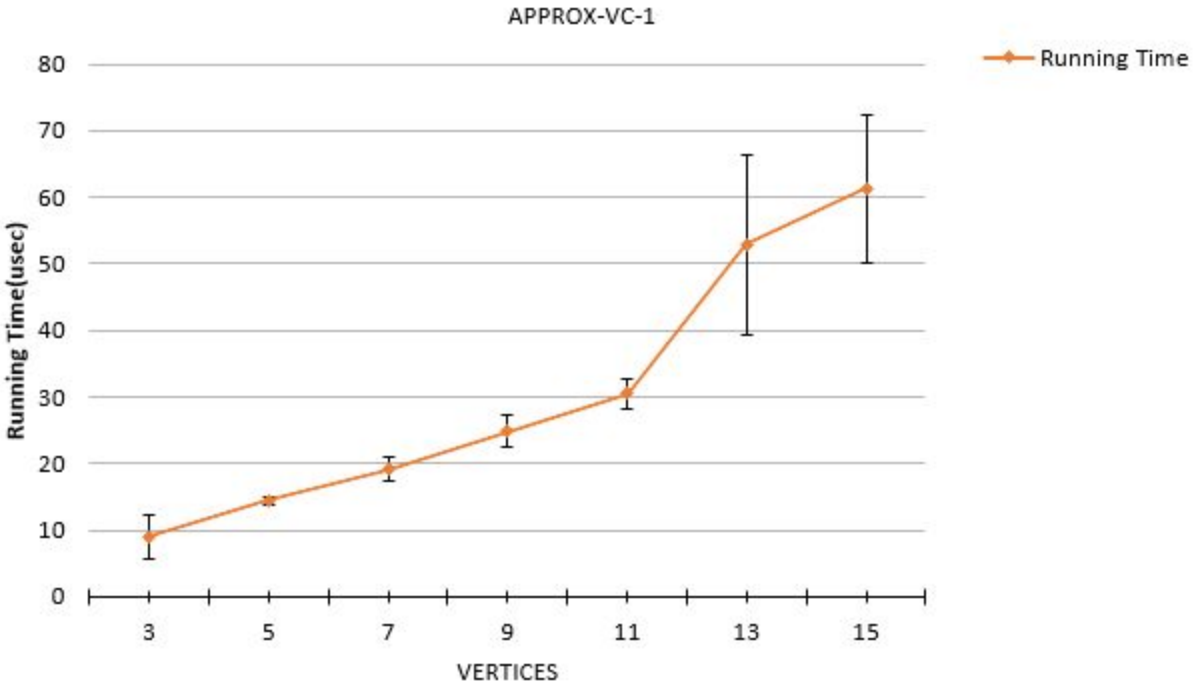


There is an exponential increase in average running time as the number of vertices increase. The reason for exponential increase is due to increase in complexity for generating clauses and by minisat to find optimal solution and also to choose minimum k.



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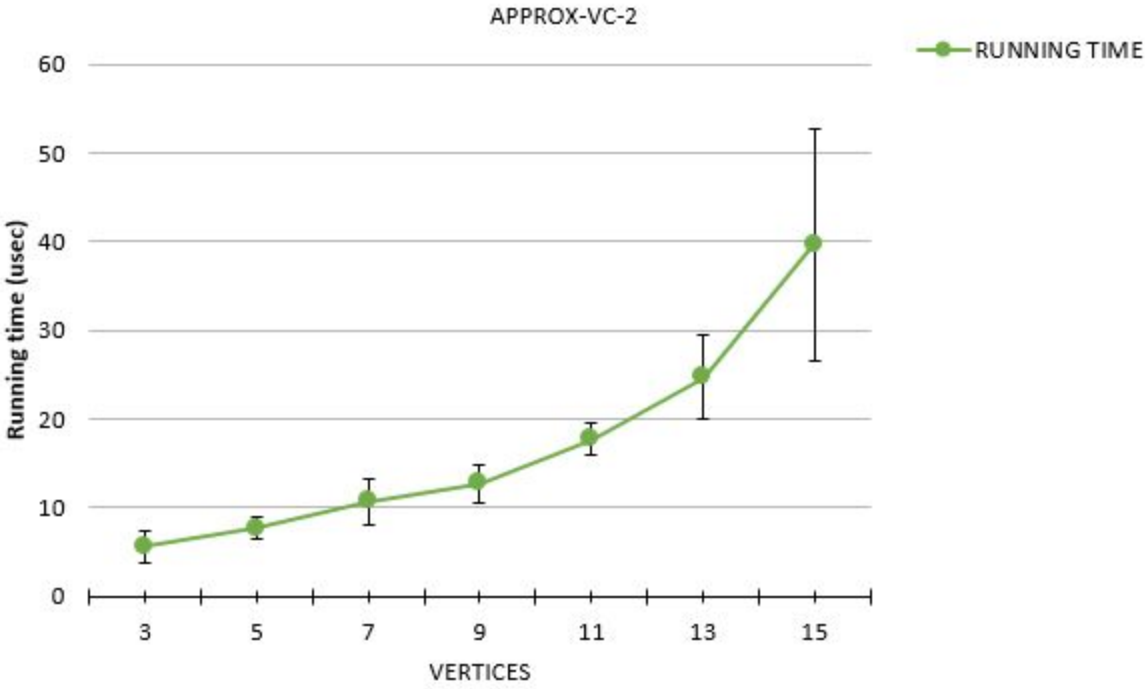
The running time for APPROX-VC-1 is linearly increasing with an increase in number of vertexes. As, the number of vertices increase so do their domain of edges and with that algorithm take more time to calculate the result. The standard deviation for running time is high at vertex 13 because there is possibility that in some graphs it got a vertex with maximum number of adjacency edges while in some graphs it got lower number value as its highest degree. Thus, taking lowest and highest time in specific cases. For example, we got one graph with highest degree 7 while on other hand we got a graph with a highest degree 3. On vertex 5 the deviation is least because almost every graph is taking same time.



The graph is slightly increasing with the increase in vertex number. The reason for an increase is that as number of vertex increases so do the number of edges. The deviation of running time from the mean for a particular vertex depends upon random selection of edge. As it depends upon the number of edges adjacent to the randomly chosen edge.

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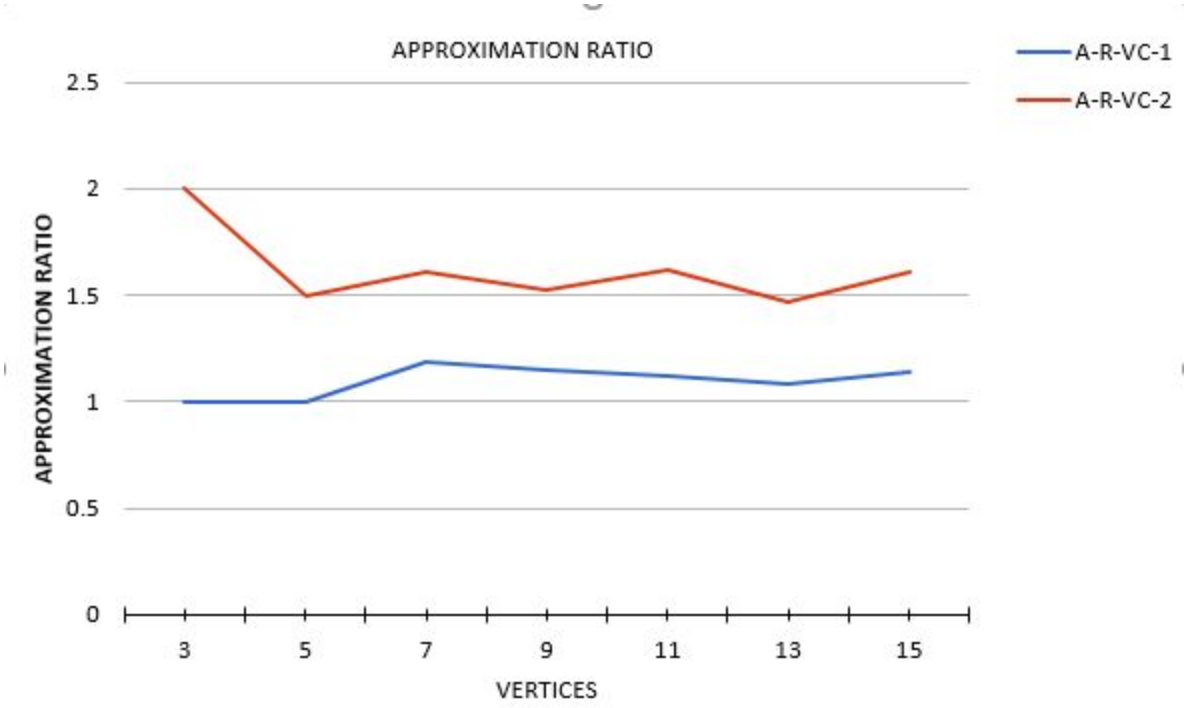

For the given set of vertices the Approximation ratio of VC-2 is more than VC-1 due to the different algorithmic approach used for calculating vertex cover. As the Graph of VC-1 is close to value 1, this shows that it gives the minimal vertex cover while the approximation ratio of VC2 is more than VC1 because it gives vertex cover based on random selection of edge in a graph.

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