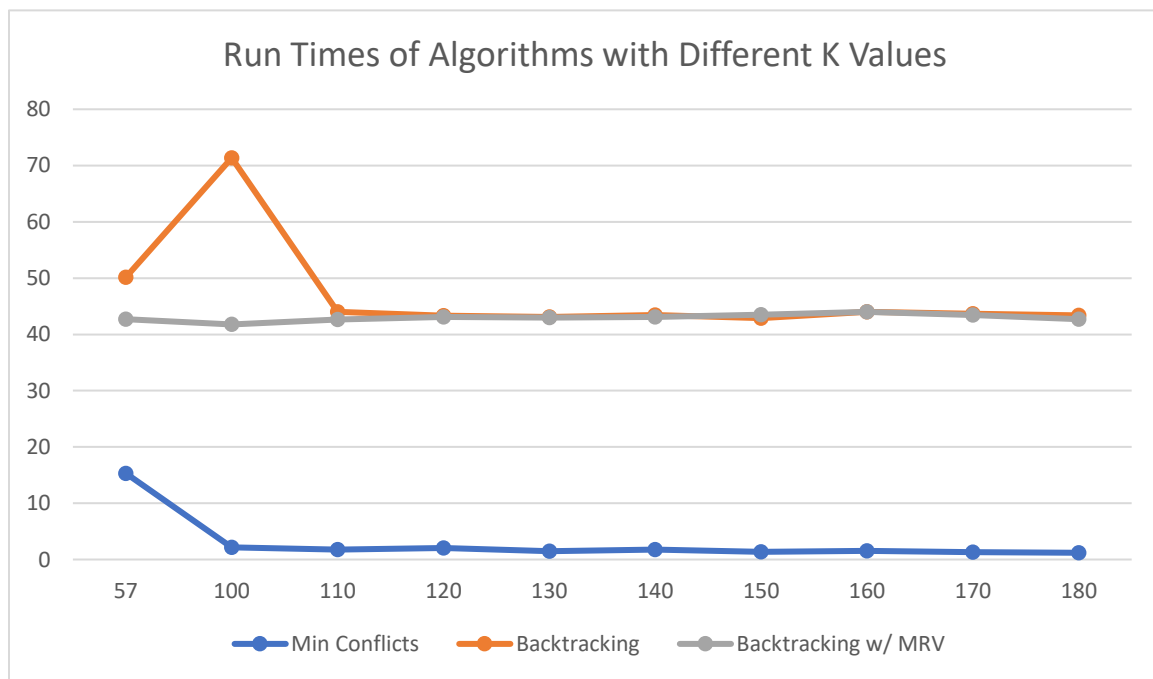


## Performance Investigation (run on given adjacency list)

Timetable (minutes):

K value	Min Conflicts	Backtracking	Backtracking w/ MRV
57 (min K value)	15.32 (timed out)	50.16	42.71
100	2.17	71.36	41.77
110	1.78	44	42.67
120	2.02	43.32	43.1
130	1.49	43.12	42.98
140	1.76	43.45	43.08
150	1.34	42.89	43.47
160	1.55	44.01	44
170	1.33	43.68	43.44
180	1.2	43.37	42.72



The min K value was found by starting with a K value of 50 and moving up until backtracking did not fail. The minimum K value where min conflicts did not time out was 60.

### Challenges:

**Min conflicts** – this algorithm needs a run timer (limit to the number of ‘for’ loop iterations) because it is not complete. If no goal state exists min conflicts will not be able to figure that out. It will simply continue to make value changes in the loop forever.

**Backtracking** – this algorithm is complete and thus does not need a run timer. However, it typically has a longer run time than min conflicts.

Min conflicts variance:

Timetable (minutes):

K value – 126

Initial conflicts	Run time
270	2.72
218 (min)	2.38 (min)
260	3.17
282	2.6
270	3.49
272	3.66
306 (max)	4.03 (max)
282	3.62
240	3.18
280	2.53

The variance is due to the random setting of initial variable values. If the initial state has relatively few conflicts then the algorithm will generally run faster than if the initial state had relatively many conflicts.