

Speed Limit task: Test cases

Case Type	Crossings	Roads	Running time in seconds (## = more than 1 hour)			
			Dijkstra/heap	Dijkstra	Clever recursive	Bad recursive
1 manual	5	8	0	0	0	0
2 random	10	30	0	0	0	0
3 complete	20	380	0	0	0,11	##
4 straight-line	100	475	0	0	1,10	##
5 grouped	90	914	0	0,05	3,08	##
6 complete	60	3540	0,05	0,22	70,33	##
7 grouped	150	2478	0,05	0,88	79,89	##
8 complete	100	9900	0,33	9,62	1499,89	##
9 complete	120	14280	0,49	20,05	##	##
10 complete	150	22350	1,15	51,87	##	##

Comments:

- I suggest that the time limit is chosen to distinguish the programs according to the line drawn in the table. The running times in the table were measured at an AMD 1400 MHz.
- The test cases 2-10 were constructed using different programs, all using random numbers.
random signifies that every edge was placed randomly.
complete is a complete graph with the start and finish crossings in the opposite corners of a quadrate and the other crossings randomly distributed in the quadrate. The distance was chosen as the normal euclidian distance and the velocities of short roads are generally higher than the velocities of long roads.
straight-line is a one-dimensional version of complete, except that the degree d is lower. The graph attains a regular structure by making the edges point from a crossing to the d next consecutive crossings.
grouped is a graph where the crossings are put in clusters, with a high degree within the cluster but only one road connecting one group with the next one. It especially intends to trick the clever recursive procedure.
- None of the test cases contains more than one road connecting the same two vertices, even if the task description does not forbid that explicitly.
- The test cases were examined with a special program to guarantee that there are never two paths from the start to the finish taking the optimal time. Therefore the solution of every test case is unique and evaluation is easy.
- I also attach my solution programs. The code is quite dirty so I think they are useful for time-checking only.

For questions and comments, please contact Pär Söderhjelm, passo3493@student.uu.se