

## Advanced Database Systems (CS60113)

### Assignment 2. NN Search on R-Tree

(Due Date: September 20 2020)

For k = 1

Srl. No.	Number of Dimensions (n)	Average Time taken (msec) (T)	Average no. of nodes/pages accessed (V)	No. of data points (N)	M, m	Linear Search number of pages accessed= $N/4096$ (L)	L/V
1	2	24.61	1158	5,000,000	455, 227	1220	1.0535
2	5	73.01	3851	5,000,000	195, 97	1220	0.3168
3	10	745.14	41370	5,000,000	99,4 9	1220	0.0295
4	50	23006.9	449963*	5,000,000	20,1 0	1220	0.0027
5	100	(100000)**	994507*	5,000,000	10,5	1220	0.0012

For k = 5

Srl. No.	Number of Dimensions (n)	Average Time taken (msec) (T)	Average no. of nodes/pages accessed (V)	No. of data points (N)	M, m	Linear Search number of pages accessed= $N/4096$ (L)	L/V
1	2	23.69	1202	5,000,000	455, 227	1220	1.0152
2	5	68.75	5575	5,000,000	195, 97	1220	0.2188
3	10	843.382	43658	5,000,000	99,4 9	1220	0.0279
4	50	23118.3	449964*	5,000,000	20,1 0	1220	0.0027
5	100	(100000)**	994507*	5,000,000	10,5	1220	0.0012

For k = 20

Srl. No.	Number of Dimensions (n)	Average Time taken (msec) (T)	Average no. of nodes/pages accessed (V)	No. of data points (N)	M, m	Linear Search number of pages accessed= $N/4096$ (L)	L/V
1	2	24.68	1349	5,000,000	455 , 227	1220	0.9043
2	5	81.25	8285	5,000,000	195, 97	1220	0.1472
3	10	906.25	50287	5,000,000	99,4 9	1220	0.0242
4	50	2321.1	449964*	5,000,000	20,1 0	1220	0.0027
5	100	(100000)**	994507*	5,000,000	10,5	1220	0.0012

\* Complete tree being traversed due to inefficiency of R-Trees for higher dimensional data.

\*\*Estimated time by interpolating the values for lower N (due to memory constraints for large N values)