Data Structures 12/7/2016

0145-343-001

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ANNOUNCEMENTS

Final Topics:

* 1/3 material before midterm
* 2/3 material after midterm
* Know searching and sorting (refer back to prior notes). Know the complexity (Big-Oh) of each sort’s case (best, worst, and average)
* tracing some code
* Given a list of numbers, create a heap and then use a heap sort (draw out each step of creating the heap, and then the sort).

Notes:

PowerPoint: <http://home.adelphi.edu/~siegfried/cs343/343l8.pdf>

Topic: Graphs (Cont’d)

Adjacency Matrix – describes the graph in terms of where a node can travel to in *k* hops.

Adj1 is the matrix of paths from a node with one arc in between

Adj2 is the matrix of paths from a node with two arcs in between

Adji is the matrix of paths from a node with i arcs in between

If you want to find a path from A to B, we simply look for it in each adjacency matrix until we find it.

path = Adj1 | Adj2 | Adj3 | … | Adji

Note that matrix multiplication is order ***O***(n3), and in the graph implementation in the code in the PowerPoint, and is performed (n-1) times, meaning it has order ***O***(n4), meaning it is VERY inefficient for large matrices and/or many matrices.