

	UNIVERSIDAD EAFIT SCHOOL OF ENGINEERING DEPARTMENT OF INFORMATICS AND SYSTEMS	Code: ST245
		Data Structures 1

Laboratory practice No. 3: Backtracking

Isaias Labrador Sanchez
 Universidad Eafit
 Medellín, Colombia
 ilabradors@eafit.edu.co

Santiago Hincapié Murillo
 Universidad Eafit
 Medellín, Colombia
 shincapiem@eafit.edu.co

Andrés Almanzar Restrepo
 Universidad Eafit
 Medellín, Colombia
 aalmanzarr@eafit.edu.co

3) Practice for final project defense presentation

3.1 One of the computational techniques is A* algorithm. This algorithm is a heuristic algorithm, labels the nodes and determinates the probability of which nodes must belong to the optimal way.

Another technique used to solve the shortest path problem is the “nearest neighbor algorithm”. This algorithm consists of just few steps. A random node will be taken and from there the nearest node will be searched. Then the old node will be changed to the new node and the new node will be called. Doing this, the desired node will be search. All this process is carried out without repeating nodes because repeating nodes would lead to an infinite loop.

3.3 Breadth First Search or BFS is usually used when you want to find the shortest path from one source node to another destination. This suggest that it would be much more optimal to represent an algorithm like the Dijkstra algorithm with BFS.

On the other hand the use of Depth First Search or DFS is more convenient for the use of algorithm that use brute force. This is because all the possible solutions are viewed.

Both types of searches are useful to find if there is a connection between one node and another. But a more appropriate used would be for a specific problem.

3.4 Algorithm A*: This algorithm is one of the most famous in addition to BFS and DFS. It consists of the following steps:

- 1) Use a random vertex
- 2) Choose a edge neighbor to the current node.(minor edge neighbor)
- 3) Now the new edge will be the current node.
- 4) Mark the current node as visited.
- 5) Go in this way until you find the destination node, in other words go back to step2
- 6) If all nodes are visited, end the algorithm.

4) Practice for midterms

1. a) (n,a) ;
 b) (a,b) ;
 c) (a,c) ;

PROFESSOR MAURICIO TORO BERMÚDEZ
Phone: (+57) (4) 261 95 00 Ext. 9473. Office: 19 - 627
E-mail: mtorobe@eafit.edu.co

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2. a) 0;
b)(v, path[] , graph[[]], pos);
c)(graph[[]] , path[] , v);
3. a) 0,4,2,61,5,3,7
b) 0,3,7,4,2,6,1,5
5. 5.1 lcs(i,i,s1,s2);
5.2 ni,nj
5.3 O(n)
6. 6.1) c 0,1,4,2,3
6.2) c 0,4,3,2,1
a)