Tuesday, 27
September 2016

CRUX

Lecture -23

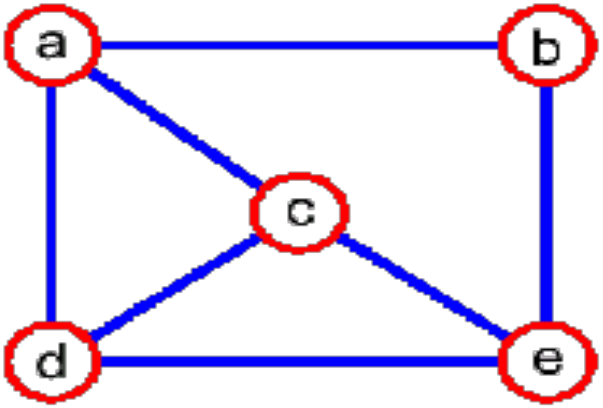
Data Structures

Graphs

CODING BLOCKS

Graphs

Graphs



V= {a,b,c,d,e}

E–
{(a,b),(a,c),(a,d),
(b,e),(c,d),(c,e),
(d,e)}

CODING BLOCKS

Terminology

1. Adjacent Vertices
2. Degree
3. Path
4. Connected Graph
5. Subgraph
6. Connected Components
7. Tree – connected and acyclic
8. Forest – a graph of many trees
9. Spanning Tree – minimum edges connected graph

Number of edges

1. Complete Graph – each vertex adjacent to all other vertices. NC2
2. Tree – N - 1
3. Connected Graph – Number of edges Between Complete Graph and Tree

How to implement Graph?

1. Edge List – Two lists (Vertices and edges)
2. Adjacency lists
3. Adjacency map
4. Adjacency matrix

Searching in a Graph

How to Search through a Graph?

1. Breadth First Search – Shortest Path
2. Depth First Search

How to traverse a Graph?

1. Breadth First Traversal
2. Depth First Traversal

Problems

1. Implement isConnected for our graph
2. Return all the connected components of the graph
3. Check if a graph is Bipartite or not.
4. Check if there is a cycle in graph.
5. Check if the graph is a tree.

Thank You!

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