

Saturday, 23 July
2016

Launchpad

Lecture -21

Data Structures

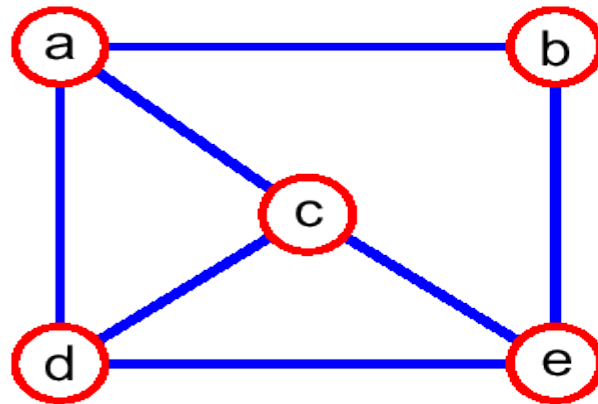
Graphs

Prateek Narang



Graphs

Graphs



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

$E =$
 $\{(a, b), (a, c), (a, d),$
 $(b, e), (c, d), (c, e),$
 $(d, e)\}$

Terminology

1. Adjacent Vertices
2. Degree
3. Path
4. Connected Graph
5. Subgraph
6. Connected Components
7. Tree
8. Forest
9. Spanning Tree

Number of edges

1. Complete Graph
2. Connected Graph
3. Tree

How to implement Graph?

1. Edge List
2. Adjacency lists
3. Adjacency matrix

Traversing a Graph

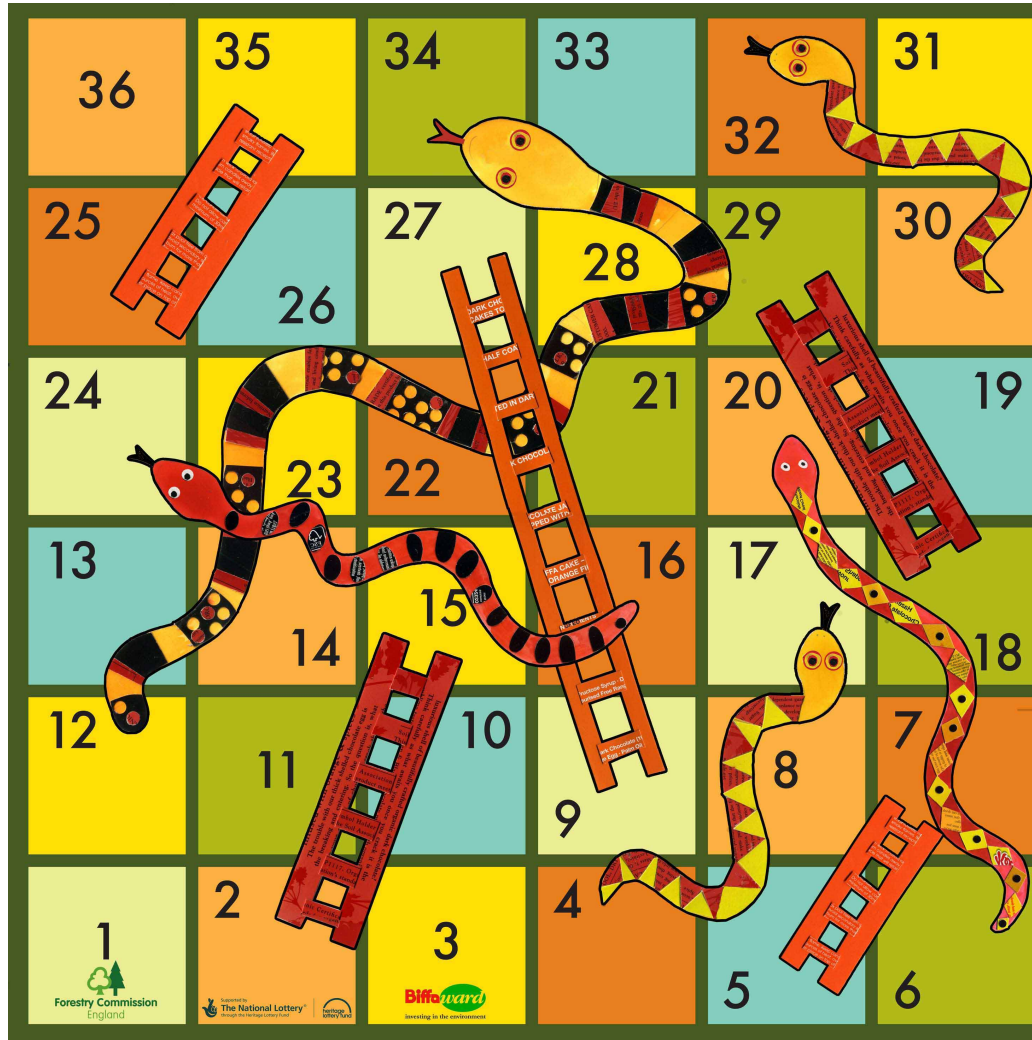
How to Search through a Graph?

1. Breadth First Search / Traversal
2. Depth First Search / Traversal

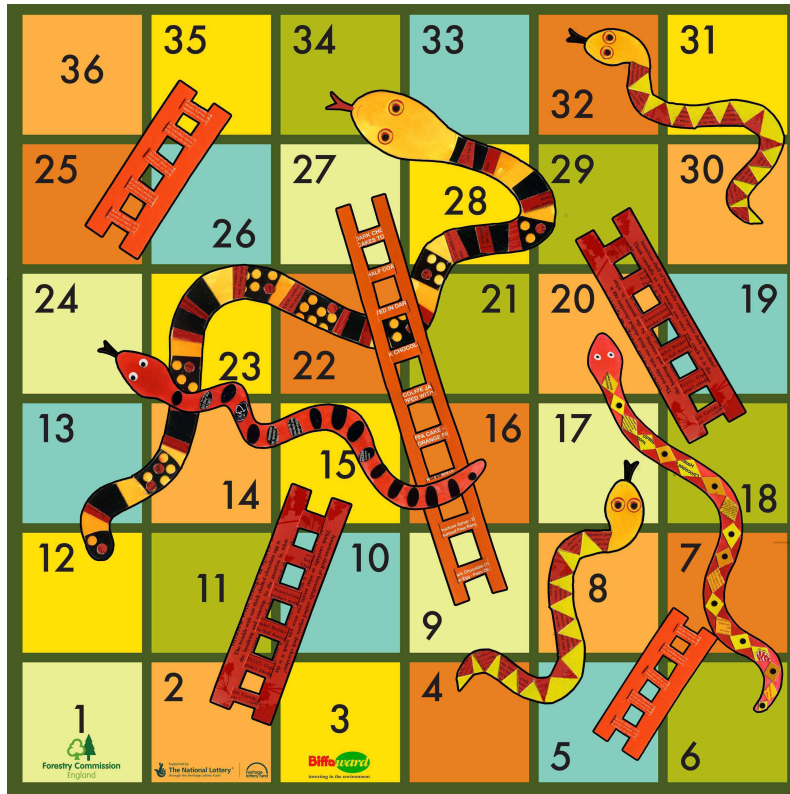
Problems

1. Implement `isConnected` for our graph.
2. Find all the connected components of the graph.

4. सांप सीढ़ी का खेल !



Input this type of graph ?



```
board[2] = 13
```

```
board[5] = 2;
```

```
board[9] = 28;
```

```
board[18] = 11;
```

```
board[17] = -13;
```

```
board[20] = -14;
```

```
board[24] = -8;
```

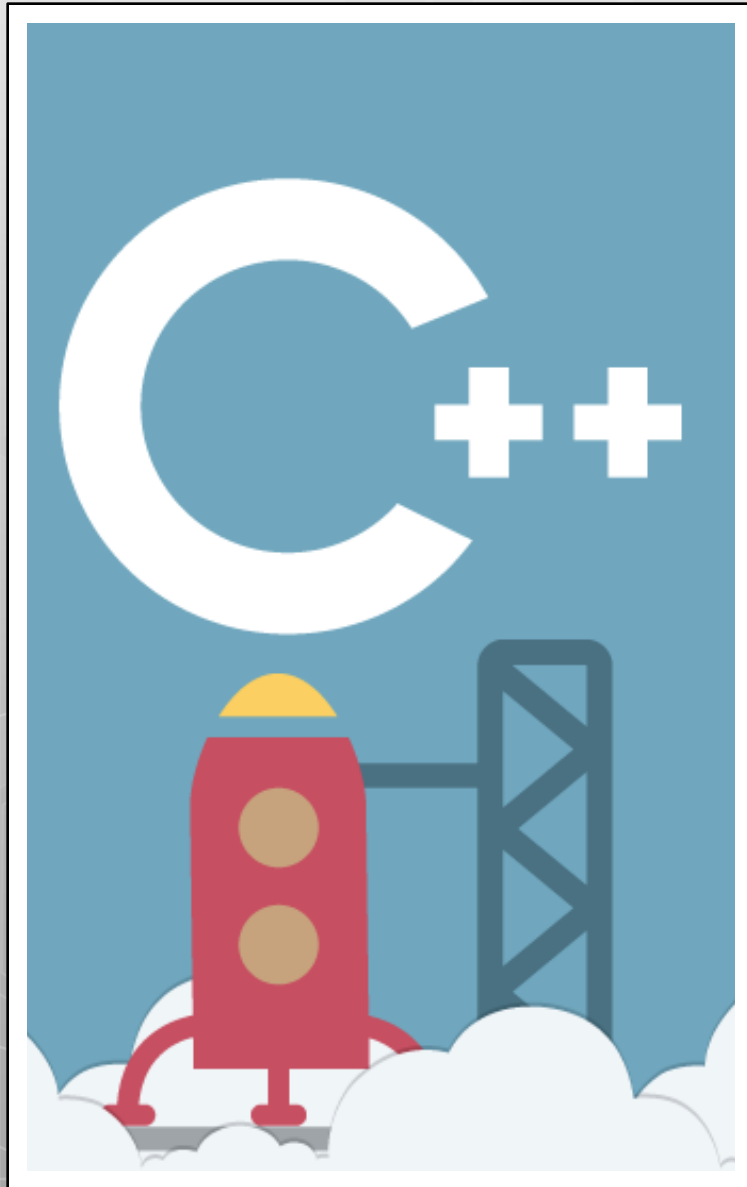
```
board[25] = 10;
```

```
board[32] = -2;
```

```
board[34] = -22;
```

Some more Graph variations

1. Directed Graphs
2. Weighted Graphs



Thank You!

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