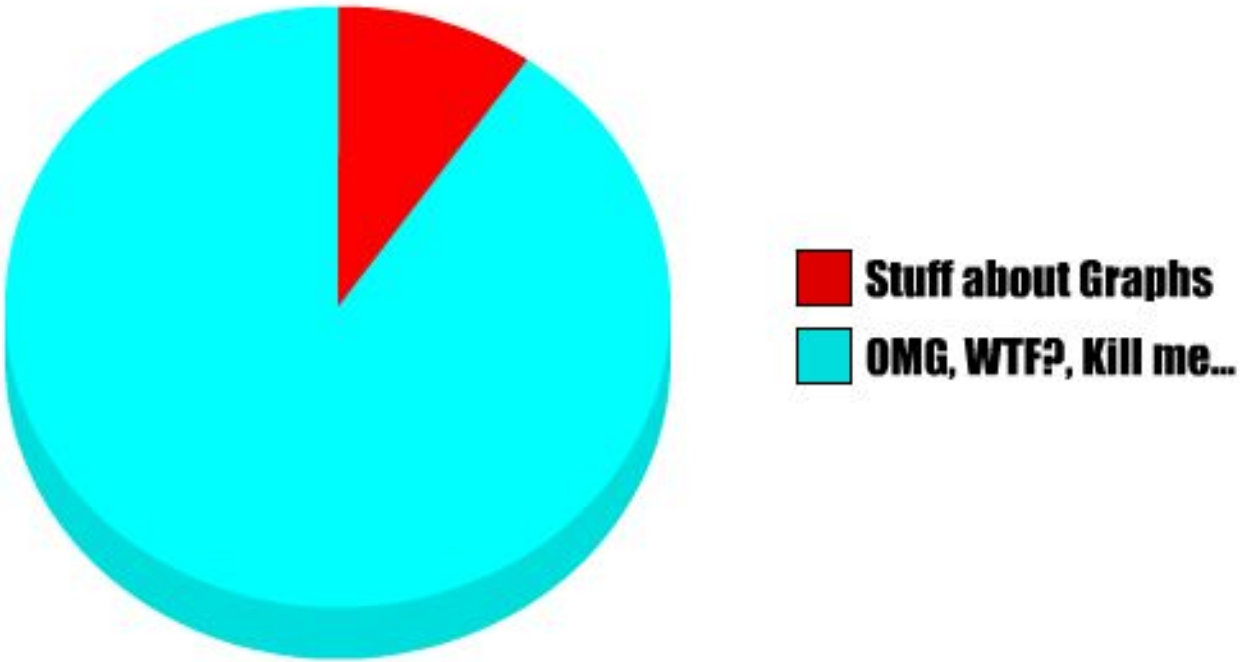
Graph Theory

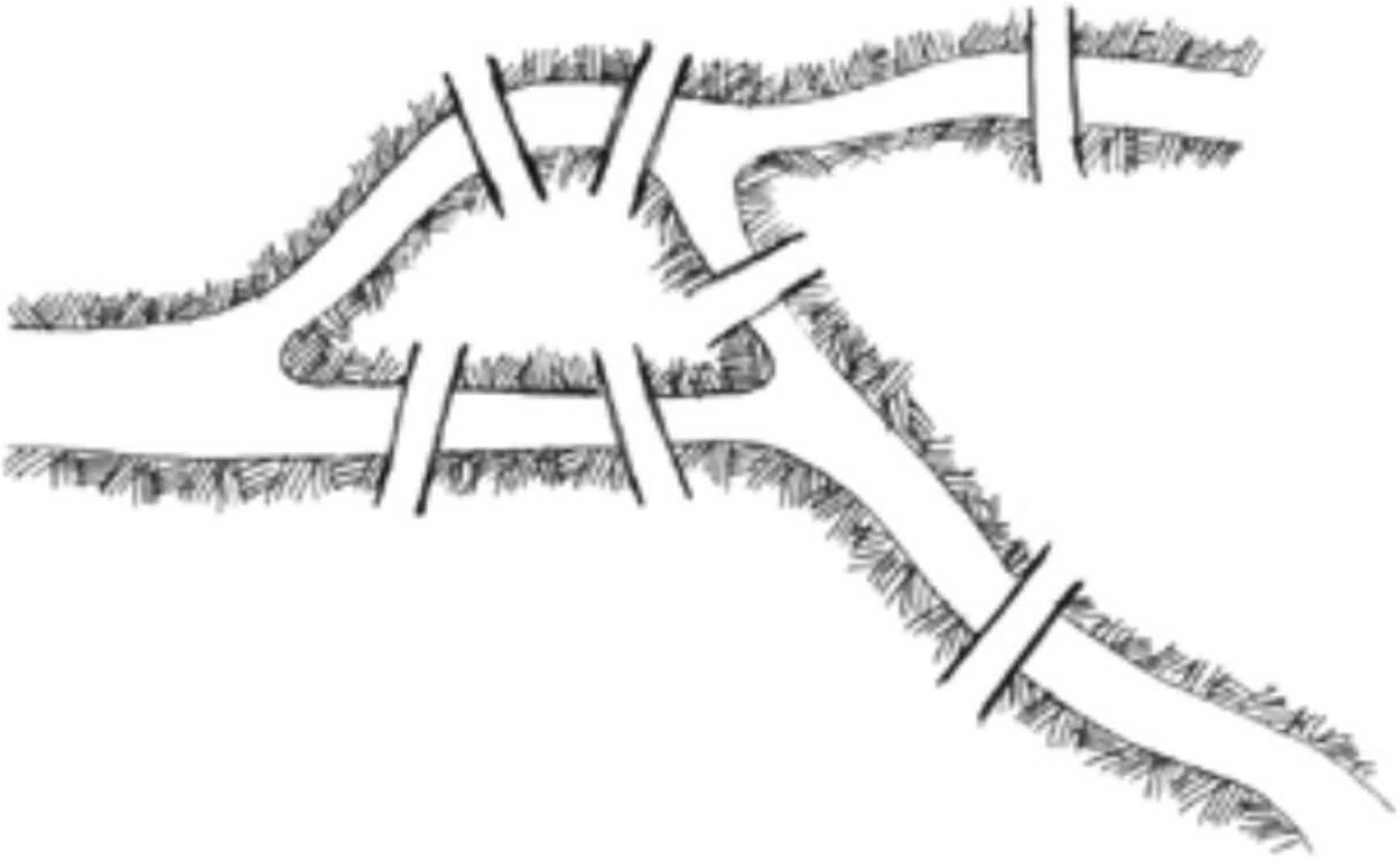
Introduction

- Codechef: rhetorical_raj
- Codeforces: Raj
- LinkedIn

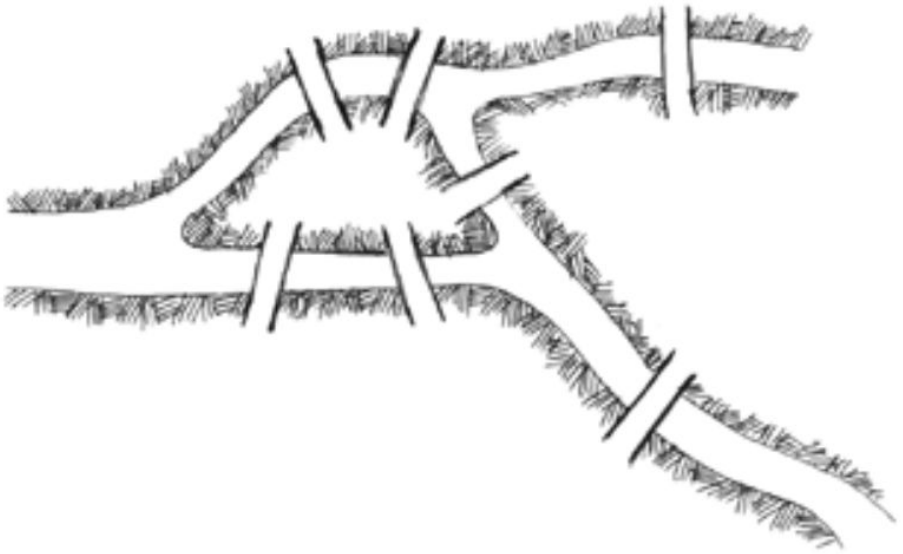
Graph Theory

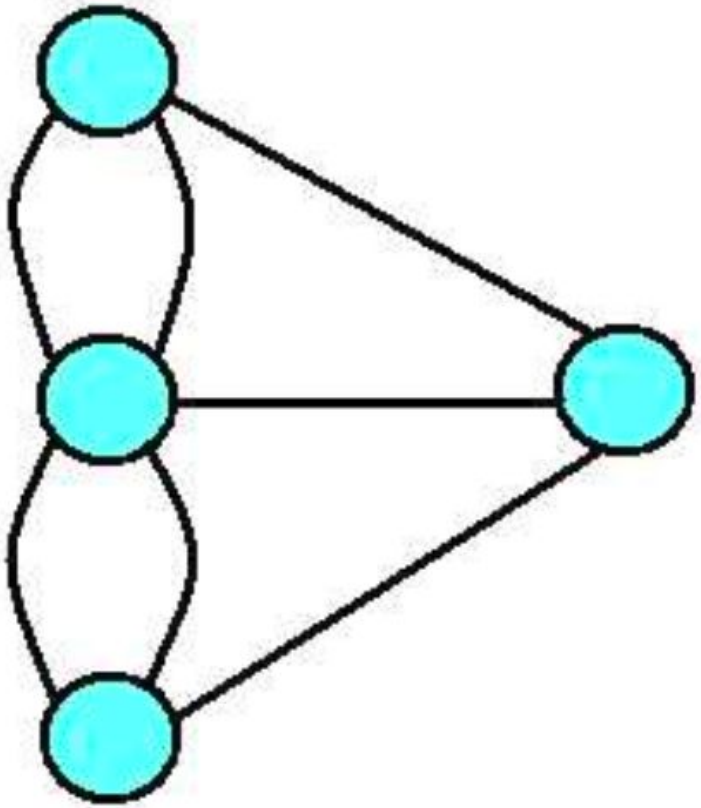


History?

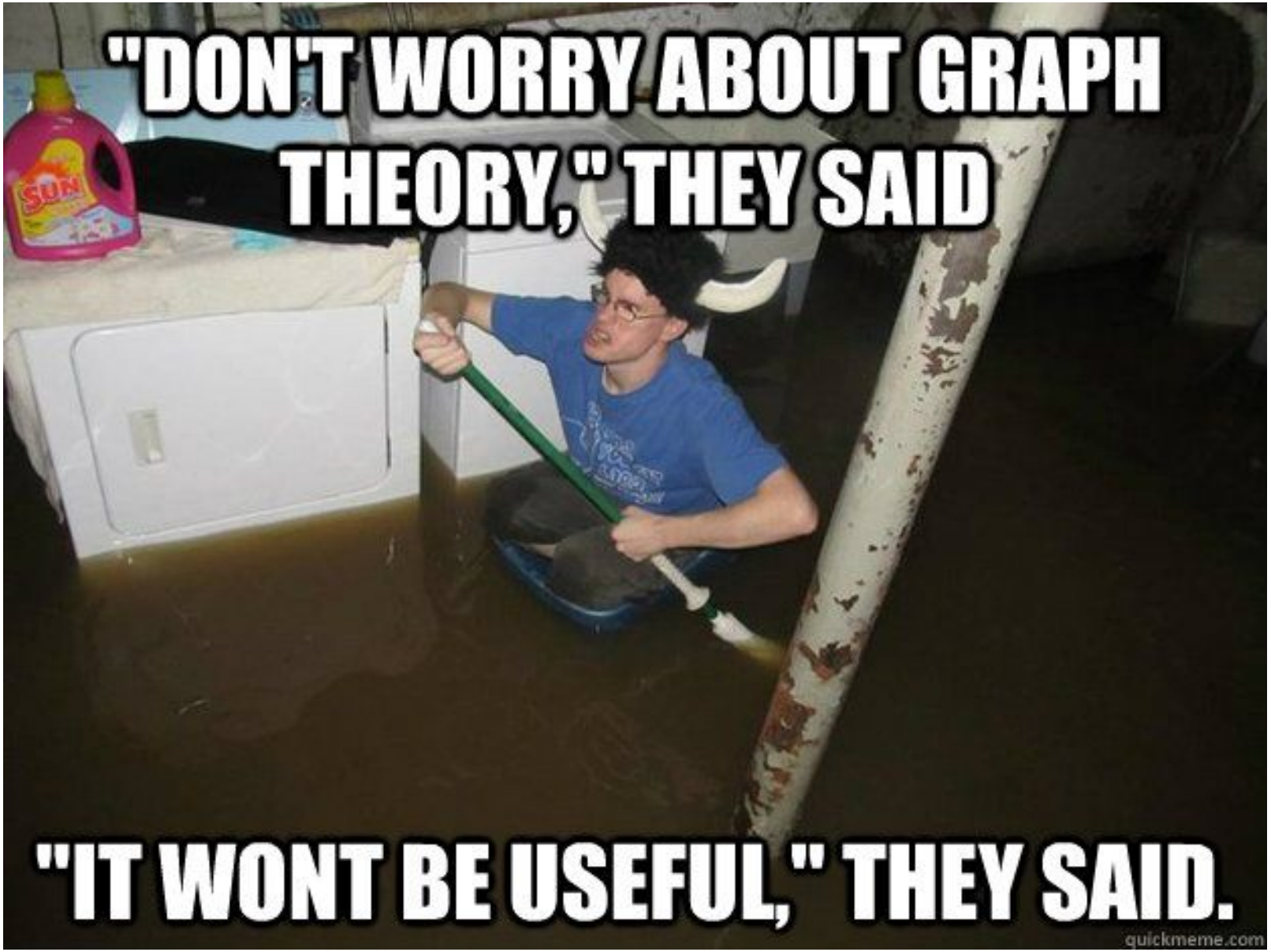


Reduce it to a graph

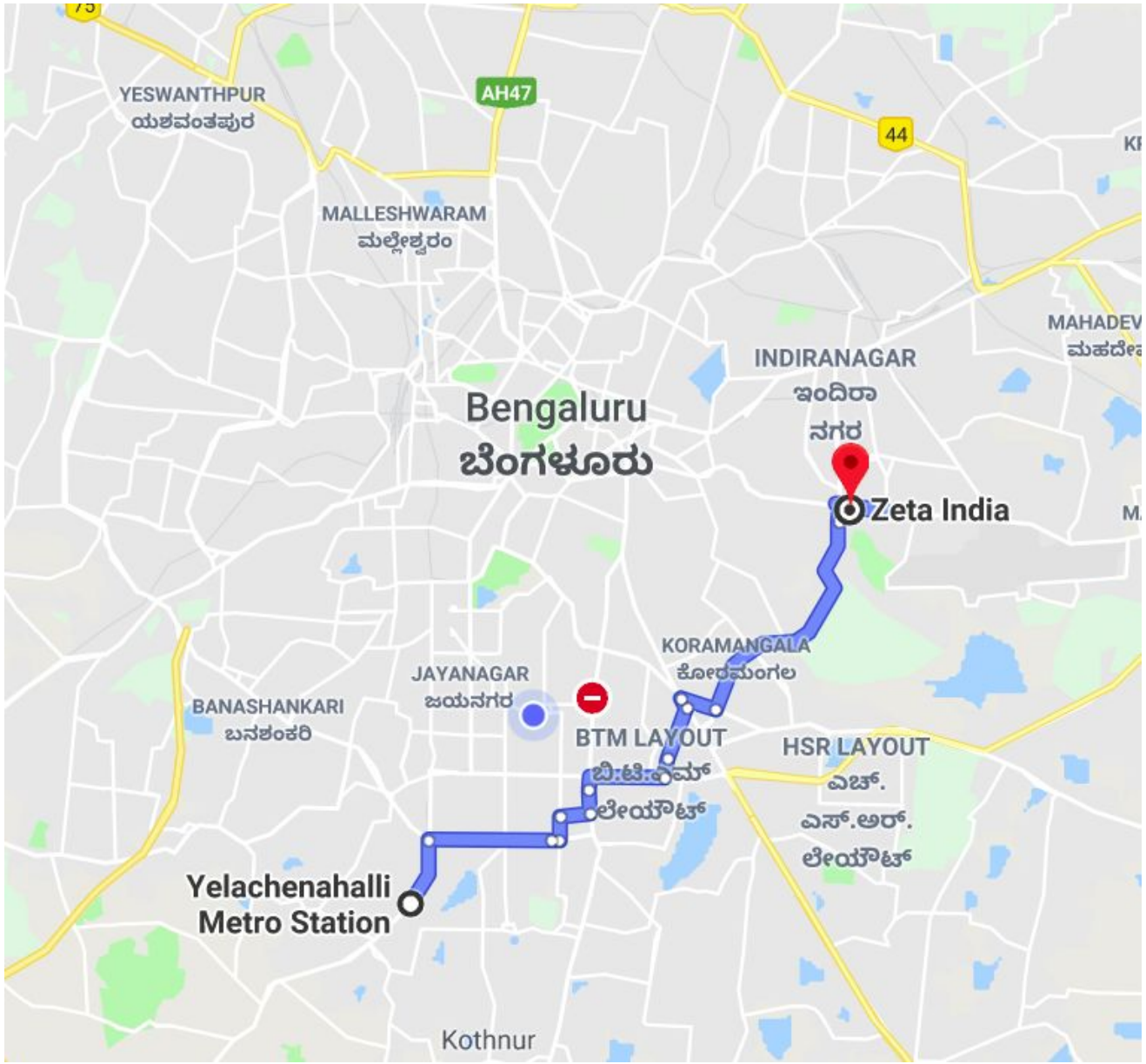




Why?


"DON'T WORRY ABOUT GRAPH THEORY," THEY SAID
"IT WONT BE USEFUL," THEY SAID.
quickmeme.com

Why?


YESWANTHPUR
ಯಶವಂತಪುರ
AH47
44
MALLESHWARAM
ಮಲ್ಲೇಶ್ವರಂ
Bengaluru
ಬೆಂಗಳೂರು
INDIRANAGAR
ಇಂದಿರಾ
ನಗರ
Zeta India
KORAMANGALA
ಕೋರಮಂಗಲ
JAYANAGAR
ಜಯನಗರ
BANASHANKARI
ಬನಶಂಕರಿ
BTM LAYOUT
ಬಿ.ಟಿ.ಎಂ
ಲೇಔಟ್
HSR LAYOUT
ಎಚ್.
ಎಸ್.ಆರ್.
ಲೇಔಟ್
Yelachenahalli
Metro Station
Kothnur

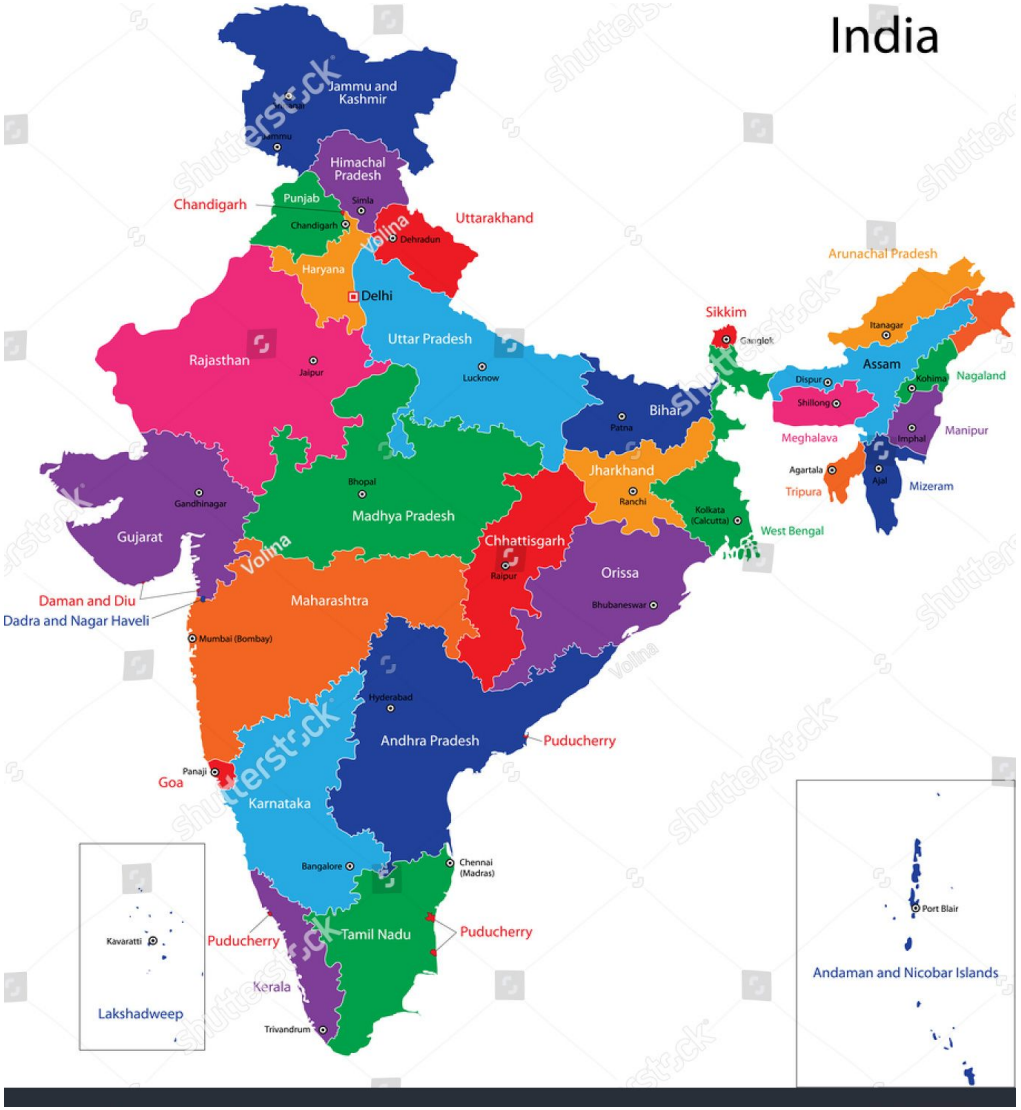
Why?

- **Road Construction**
- Minimum Spanning Tree

- **Computer Networks**
- Routing, Broadcasting

- **Facebook/Social Networks**
- Mutual Friends

Map Colouring



Graph - Data Structure

- A Non Linear Data Structure
- Linear..? Non Linear..?
- Components
- Mathematical Representation

Terminology

- Degree
- Loops
- Cycle

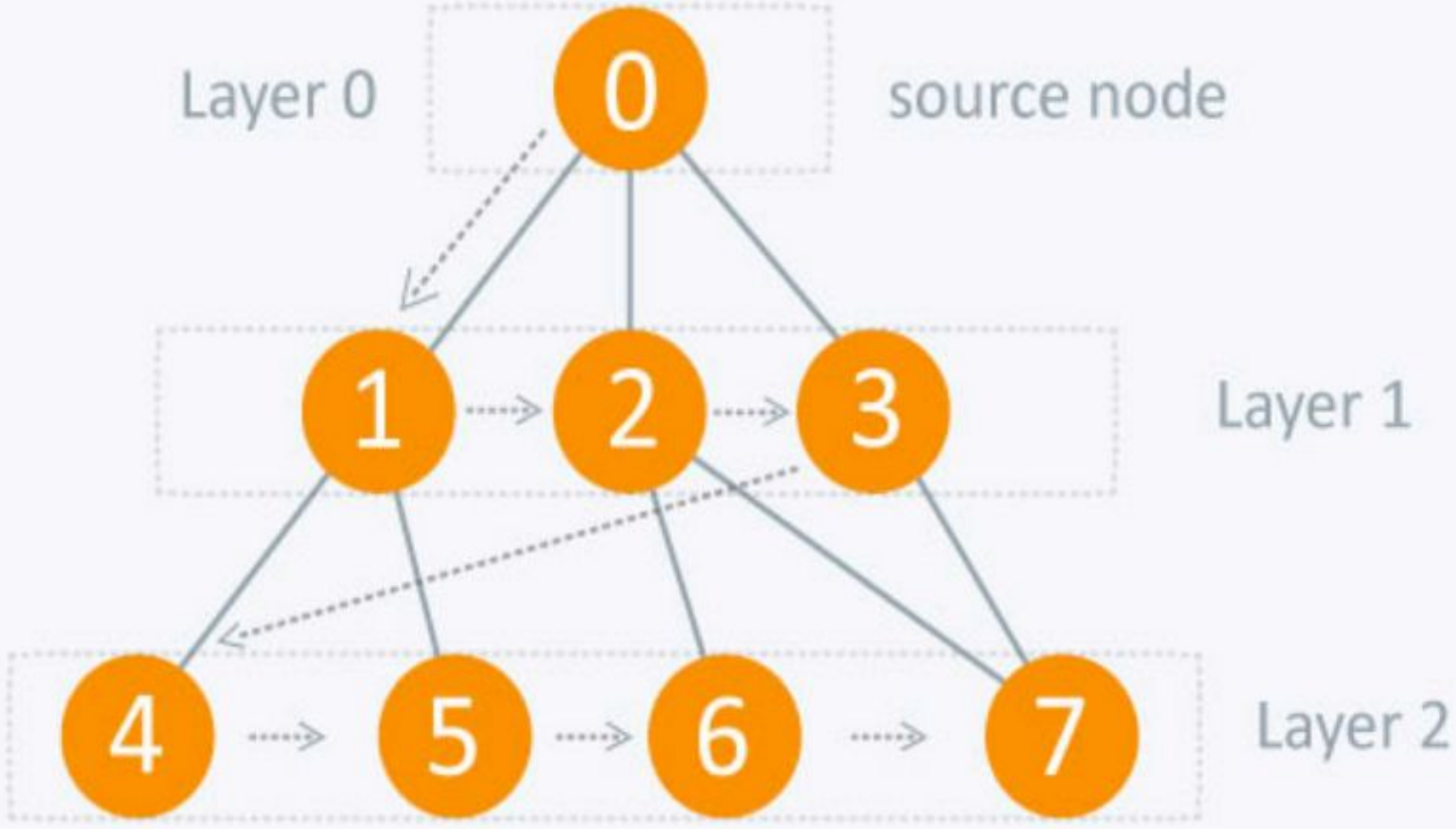
- Directed and Undirected
- Weighted
- Connected
- Complete

Representation

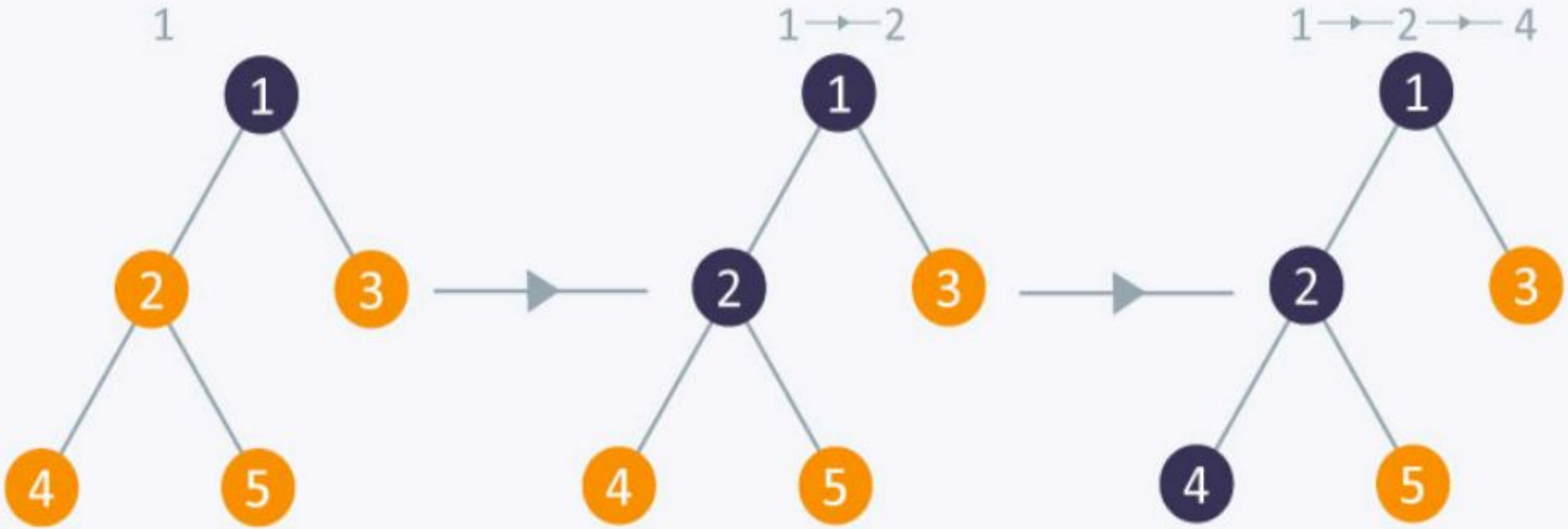
- Adjacency Matrix
- Adjacency List

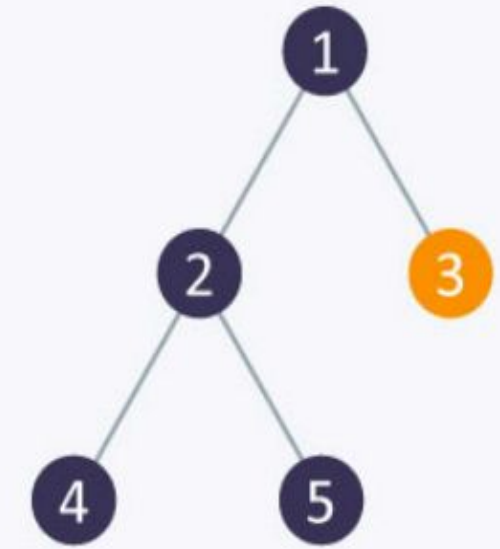
BREADTH-FIRST SEARCH
DEPTH-FIRST SEARCH
CAPTAIN AMERICA
CIVIL WAR
MAY 6, 2016

BFS

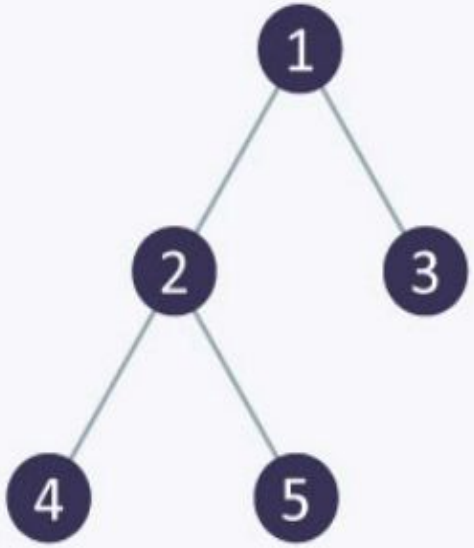


DFS



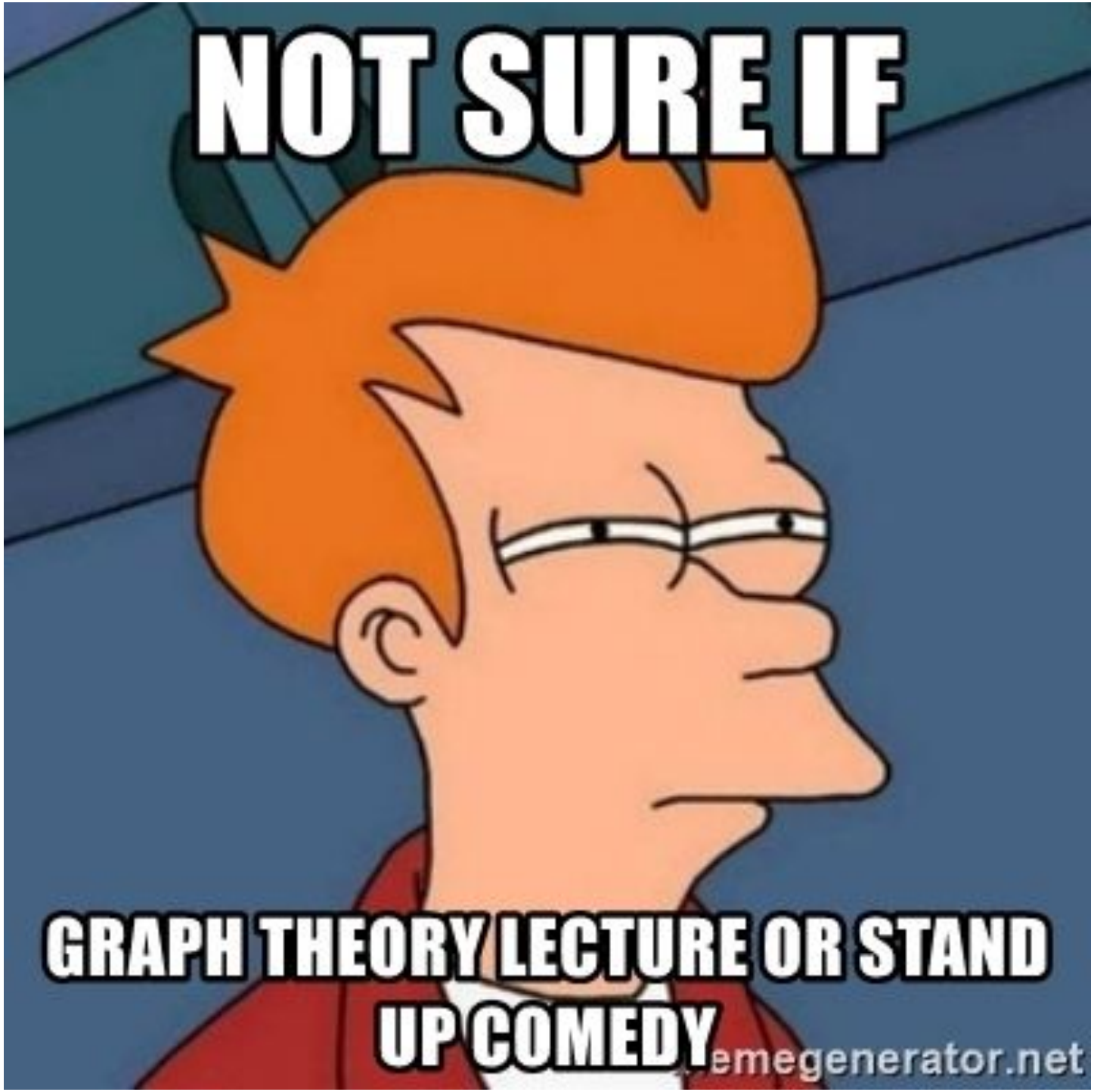


1 → 2 → 4 → 5



1 → 2 → 4 → 5 → 3

ATTEMPTS TO IMPLEMENT A BREADTH-FIRST SEARCH
USES STACK INSTEAD OF QUEUE
memegenerator.net


NOT SURE IF
GRAPH THEORY LECTURE OR STAND UP COMEDY
emegenerator.net

Problems

- Topology - *link*
- Fence - *link*
- King Escape - *link*
- Connected Components
- Connected Cells - *link*
- Connect - *link*
- Gardens - link
- Island Problem- *link*