Graphs and Trees

Terminology

graph

node

edge

depth-first search

breadth-first search

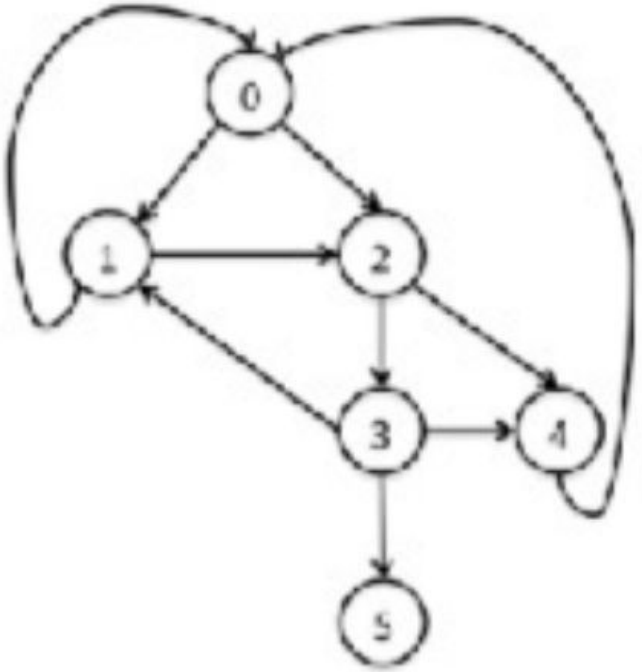
child

parent

Graph

node

edge

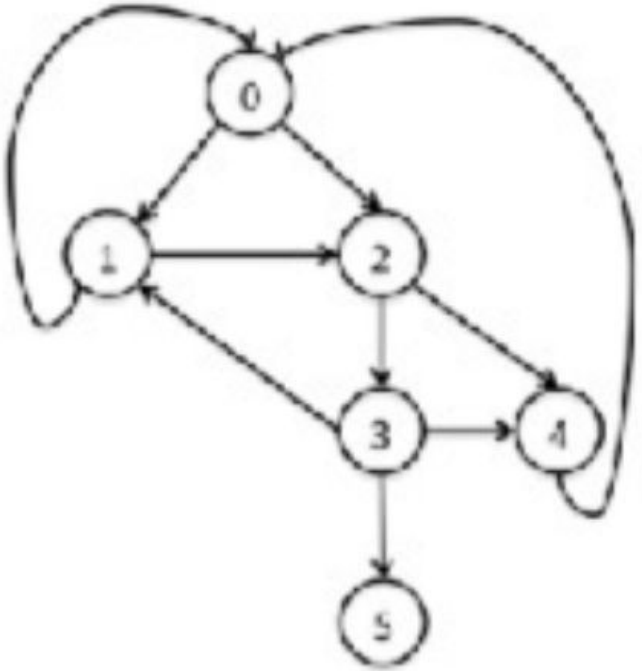


Metro Map

What is the optimal path from 0 to 5?

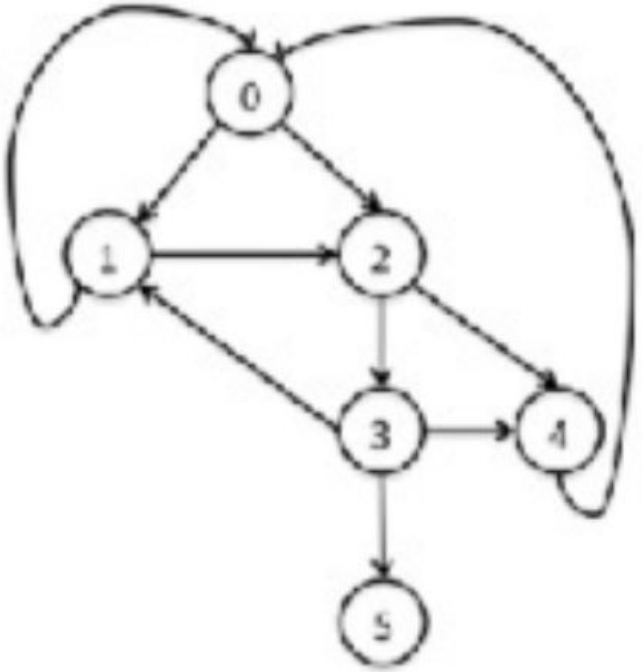
Consider:

- what does optimal imply
- fewest?
- shortest?
- cheapest?



Solutions - depth-first search

- Start at 0, go down as far as possible
- 1
- 2
- 3
- 5 (hey that was the goal! store that)
- backtrack to 3…
- 4
- 0 already visited!
- backtrack to 2 …
- 4 already visited!



Solutions - breadth-first search

- Start at 0, go down as far as possible
- 0
- 1
- backtrack to 0
- 2
- —-------- layer 1 done
- from 1
- 2 already visited
- from 2
- 3
- backtrack to 2
- 4
- —------- layer 2 done