Uninformed Search Review

Problem Definition

- State space (implicitly defined)
  - State tells all there is to know about the world during problem solving
- Operators (*f:state->state)*
- Initial state(s)
- Goal test
- Path cost

Breadth First Search

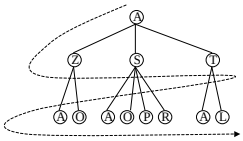
☺Complete?
- Yes (if *b* is finite)

☹Time? b^d

☹Space? b^d

☺Optimal?
- Yes (if step cost = 1)

- Queueing Function
  Add to end



Queue Trace
A
Z S T
S T A O
T A O A O P R
A O A O P R A L

Uniform Cost Search

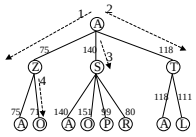
☺Complete?
- Yes (if step cost >= ε)

☹Time?
- # of nodes with g <= optimal soln cost

☹Space? Same as time

☺Optimal? Yes

- Queueing Function
  Sort nodes by path cost



Queue Trace
A
Z:75 T:118 S:140
T:118 S:140 O:146 A:150
S:140 O:146 A:150 L:229 A:236
O:146 A:150 R:220 L:229 A:236
P:239 A:280 O:291

Depth First Search

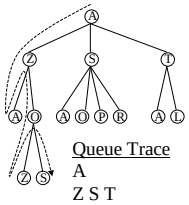
☹Complete? No
Modification to avoid repeated states helps, but still not complete

☹Time? b^m (bad if *m >> d)*

☺Space? bm (linear)

☹Optimal? No

- Queueing Function
  Add to beginning



Queue Trace
A
Z S T
A O S T
O S T
Z S S T

Iterative Deepening DFS

- Use increasing cutoffs to limit search depth
- Search using DFS

☺Complete? Yes

☹Time? b^d

☺Space? bd

☺Optimal? Yes (if step cost = 1, can be modified to search uniform cost tree)