

Search Algorithm	Missionaries and Cannibals	Towers of Hanoi	Farmer Fox Chicken and Grain
Depth First Search	Solution Path Length = 9 States Expanded = 10 Max Open Length = 2	Solution Path Length = 40 States Expanded = 40 Max Open Length = 7	Solution Path Length = 7 States Expanded = 7 Max Open Length = 4
Breadth First Search	Solution Path Length = 7 States Expanded = 10 Max Open Length = 2	Solution Path Length = 18 States Expanded = 70 Max Open Length = 16	Solution Path Length = 7 States Expanded = 10 Max Open Length = 3

Paths

- Missionaries:** for [x,y], there are x missionaries and y cannibals on the left bank
 - BFS:** [3,3] → [2,2] → [3,2] → [1,1] → [3,1] → [0,1] → [1,1] → [0,0]
 - DFS:** [3,3] → [2,2] → [3,2] → [0,2] → [2,2] → [1,1] → [3,1] → [0,1] → [1,1] → [0,0]
- Farmer Fox:** F: Farmer, g: Grain, c: Chicken, f: Fox. Letters represent things on left bank.
 - BFS:** Fcfg → fg → Ffg → f → Fcf → c → Fc → done!
 - DFS:** Fcfg → fg → Ffg → g → Fcg → c → Fc → done!
- Towers Of Hanoi (4):** bigger numbers are bigger disks.
 - DFS**

```

[[4, 3, 2, 1], [], []]
[[4, 3, 2], [1], []]
[[4, 3], [1], [2]]
[[4, 3, 1], [], [2]]
[[4, 3], [], [2, 1]]
[[4], [3], [2, 1]]
[[4, 1], [3], [2]]
[[4], [3, 1], [2]]
[[4, 2], [3, 1], []]
[[4, 2, 1], [3], []]
[[4, 2], [3], [1]]
[[4], [3, 2], [1]]
[[4, 1], [3, 2], []]
[[4], [3, 2, 1], []]
[], [3, 2, 1], [4]]

```

[[1],[3,2],[4]]
 [],[3,2],[4,1]]
 [[2],[3],[4,1]]
 [[2,1],[3],[4]]
 [[2],[3,1],[4]]
 [],[3,1],[4,2]]
 [[1],[3],[4,2]]
 [],[3],[4,2,1]]
 [[3],[],[4,2,1]]
 [[3,1],[],[4,2]]
 [[3],[1],[4,2]]
 [[3,2],[1],[4]]
 [[3,2,1],[],[4]]
 [[3,2],[],[4,1]]
 [[3],[2],[4,1]]
 [[3,1],[2],[4]]
 [[3],[2,1],[4]]
 [],[2,1],[4,3]]
 [[1],[2],[4,3]]
 [],[2],[4,3,1]]
 [[2],[],[4,3,1]]
 [[2,1],[],[4,3]]
 [[2],[1],[4,3]]
 [],[1],[4,3,2]]
 [[1],[],[4,3,2]]
 [],[],[4,3,2,1]]

b. BFS

[[4,3,2,1],[],[]]
 [[4,3,2],[1],[]]
 [[4,3],[1],[2]]
 [[4,3],[],[2,1]]
 [[4],[3],[2,1]]
 [[4,1],[3],[2]]
 [[4,1],[3,2],[]]
 [[4],[3,2,1],[]]
 [],[3,2,1],[4]]

[[1],[3,2],[4]]
[[],[3,2],[4,1]]
[[2],[3],[4,1]]
[[2,1],[],[4,3]]
[[2],[1],[4,3]]
[[],[1],[4,3,2]]
[[1],[],[4,3,2]]
[[],[],[4,3,2,1]]