	Humans, Robots, and Ferry DFS	**Humans, Robots, and Ferry** BFS	**Farmer, Fox, Chicken, Grain** DFS	**Farmer, Fox, Chicken, Grain** BFS	**4-disk Towers of Hanoi** DFS	**4-disk Towers of Hanoi** BFS
Path	H on left:3 R on left:3 H on right:0 R on right:0 ferry is on the left. H on left:2 R on left:2 H on right:1 R on right:1 ferry is on the right. H on left:3 R on left:2 H on right:0 R on right:1 ferry is on the left. H on left:0 R on left:2 H on right:3 R on right:1 ferry is on the right.	H on left:3 R on left:3 H on right:0 R on right:0 ferry is on the left. H on left:2 R on left:2 H on right:1 R on right:1 ferry is on the right. H on left:3 R on left:2 H on right:0 R on right:1 ferry is on the left. H on left:0 R on left:2 H on right:3 R on right:1 ferry is on the right.	H on left:1 F on left:1 C on left:1 G on left:1 H on right:0 F on right:0 C on right:0 G on right:0 boat is on the left. H on left:0 F on left:1 C on left:0 G on left:1 H on right:1 F on right:0 C on right:1 G on right:0 boat is on the right. H on left:1 F on left:1 C on left:0 G on left:1 H on right:0 F on right:0	H on left:1 F on left:1 C on left:1 G on left:1 H on right:0 F on right:0 C on right:0 G on right:0 boat is on the left. H on left:0 F on left:1 C on left:0 G on left:1 H on right:1 F on right:0 C on right:1 G on right:0 boat is on the right. H on left:1 F on left:1 C on left:0 G on left:1 H on right:0 F on right:0	[[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] ,[3] ,[2, 1]] [[4, 1] ,[3] ,[2]] [[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] ,[3] ,[4] ,[1]] [[4] ,[3] ,[2]] [[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] ,[3] ,[4] ,[1]] [[2, 1] ,[3] ,[4]] [[2, 1] ,[] ,[4, 3]] [[2] ,[1] ,[4, 3]] [[] ,[1] ,[4, 3, 2]] [[] ,[] ,[4, 3, 2, 1]]	[[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] ,[3, 2, 1] ,[]] [[] ,[3, 2, 1] ,[4]] [[2] ,[3] ,[4, 1]] [[2, 1] ,[3] ,[4]] [[2, 1] ,[] ,[4, 3]] [[2] ,[1] ,[4, 3]] [[] ,[1] ,[4, 3, 2]] [[] ,[] ,[4, 3, 2, 1]]

	H on left:2 R on left:2 H on right:1 R on right:1 ferry is on the left. H on left:1 R on left:1 H on right:2 R on right:2 ferry is on the right. H on left:3 R on left:1 H on right:0 R on right:2 ferry is on the left. H on left:0 R on left:1 H on right:3 R on right:2 ferry is on the right. H on left:1 R on left:1 H on right:2	H on left:2 R on left:2 H on right:1 R on right:1 ferry is on the left. H on left:0 R on left:1 H on right:3 R on right:2 ferry is on the right. H on left:1 R on left:1 H on right:2 R on right:2 ferry is on the left. H on left:0 R on left:0 H on right:3 R on right:3 ferry is on the right 	C on right:1 G on right:0 boat is on the left. H on left:0 F on left:0 C on left:0 G on left:1 H on right:1 F on right:1 C on right:1 G on right:0 boat is on the right. H on left:1 F on left:0 C on left:1 G on left:1 H on right:0 F on right:1 C on right:0 G on right:0 boat is on the left. H on left:0 F on left:0 C on left:1 G on left:0	C on right:1 G on right:0 boat is on the left. H on left:0 F on left:0 C on left:0 G on left:1 H on right:1 F on right:1 C on right:1 G on right:0 boat is on the right. H on left:1 F on left:0 C on left:1 G on left:1 H on right:0 F on right:1 C on right:0 G on right:0 boat is on the left. H on left:0 F on left:0 C on left:1 G on left:0	[[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]]	

	R on right:2 ferry is on the left. H on left:0 R on left:0 H on right:3 R on right:3 ferry is on the right		H on right:1 F on right:1 C on right:0 G on right:1 boat is on the right. H on left:1 F on left:0 C on left:1 G on left:0 H on right:0 F on right:1 C on right:0 G on right:1 boat is on the left. H on left:0 F on left:0 C on left:0 G on left:0 H on right:1 F on right:1 C on right:1 G on right:1 boat is on the right	H on right:1 F on right:1 C on right:0 G on right:1 boat is on the right. H on left:1 F on left:0 C on left:1 G on left:0 H on right:0 F on right:1 C on right:0 G on right:1 boat is on the left. H on left:0 F on left:0 C on left:0 G on left:0 H on right:1 F on right:1 C on right:1 G on right:1 boat is on the right	[[1] ,[] ,[4, 3, 2]] [[] ,[] ,[4, 3, 2, 1]]	
Length of solution path	9	7	7	7	40	15

Number of states expanded	10	10	7	9	40	70

i. For the Towers of Hanoi problem, the maximum length of the open list is different from BFS which is 16, compared to DFS which is 7 in this case. The reason why BFS has usually a smaller maximum length of open list is because BFS explores all the current nodes at the level first, however, for DFS, you are exploring the deepest nodes first, so that the open list would be potentially smaller, since you would only be at max increasing the size of the open list by at most one. The worst case would be if DFS had only left node trees, which would mean that the maximum length of the open list would be increasing by one every time it increased in depth by one.

ii. The solution path is different since BFS explores the most optimal path by finding the shortest path since all edges are unweighted in this scenario, while DFS is non-optimal.