BlindSearches

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<DFS>

	Human, Robots and Ferry	Farmer, Fox, Chicken, and Grain	4-Disk Towers of Hanoi
the 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.	F on left:1 f on left:1 c on left:1 g on left:1 F on right:0 f on right:0 c on right:0 g on right:0 ferry is on the left. F on left:0 f on left:1 c on left:0 g on left:1 F on right:1 f on right:0 c on right:1 g on right:0 ferry is on the right. F on left:1 f on left:1 c on left:0 g on left:1 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, 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]]

		f on right:0	[[3] ,[2] ,[4, 1]]
	H on left:0	c on right:1	[[3, 1] ,[2] ,[4]]
	R on left:2	g on right:0	[[3] ,[2, 1] ,[4]]
	H on right:3	ferry is on the left.	[[] ,[2, 1] ,[4, 3]]
	R on right:1		[[1] ,[2] ,[4, 3]]
			[[] ,[2] ,[4, 3, 1]]
			[[2] ,[] ,[4, 3, 1]]
	ferry is on the right.	F on left:0	[[2, 1] ,[] ,[4, 3]]
		f on left:0	[[2] ,[1] ,[4, 3]]
		c on left:0	[[] ,[1] ,[4, 3, 2]]
		g on left:1	[[1] ,[] ,[4, 3, 2]]
	H on left:2	F on right:1	[[] ,[] ,[4, 3, 2, 1]]
	R on left:2	f on right:1	
	H on right:1	c on right:1	
	R on right:1	g on right:0	
	ferry is on the left.	ferry is on the right.	
		F on left:1	
		f on left:0	
	H on left:1	c on left:1	
	R on left:1	g on left:1	
	H on right:2	F on right:0	
	R on right:2	f on right:1	
	ferry is on the right.	c on right:0	
		g on right:0	
		ferry is on the left.	
	H on left:3	F on left:0	
	R on left:1	f on left:0	
	H on right:0	c on left:1	
	R on	g on left:0	
		F on right:1	

	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
	   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.
	(b) 9 edges
	(c) 10
	<BFS>
		f on right:1
		c on right:0
		g on right:1
		ferry is on the right.
		
		F on left:1
		f on left:0
		c on left:1
		g on left:0
		   F on right:0
		   f on right:1
		   c on right:0
		   g on right:1
		ferry is on the left.
		
		F on left:0
		f on left:0
		c on left:0
		g on left:0
		   F on right:1
		   f on right:1
		   c on right:1
		   g on right:1
		ferry is on the right.	

	(a)		
	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: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		
the length of path	9	7	40
the number of nodes expanded	10	7	40

\<BFS\>

	Human, Robots and Ferry	Farmer, Fox, Chicken, and Grain	4-Disk Towers of Hanoi
the path	H on left:3 R on left:3 H on right:0 R on right:0 ferry is on the	F on left:1 f on left:1 c on left:1 g on left:1 F on right:0 f on	[[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] ,[]]

left.	right:0	[[4] ,[3, 2, 1] ,[]]
	c on right:0	[[] ,[3, 2, 1] ,[4]]
	g on right:0	[[] ,[3, 2] ,[4, 1]]
H on left:2		[[2] ,[3] ,[4, 1]]
R on left:2		[[2, 1] ,[3] ,[4]]
H on right:1	ferry is on the left.	[[2, 1] ,[] ,[4, 3]]
R on right:1		[[2] ,[1] ,[4, 3]]
		[[] ,[1] ,[4, 3, 2]]
ferry is on the right.	F on left:0	[[] ,[] ,[4, 3, 2, 1]]
	f on left:1	
	c on left:0	
	g on left:1	
H on left:3	F on right:1	
R on left:2		
H on right:0	f on right:0	
R on right:1	c on right:1	
ferry is on the left.	g on right:0	
	ferry is on the right.	
H on left:0		
R on left:2		
H on right:3	F on left:1	
R on right:1	f on left:1	
ferry is on the right.	c on left:0	
	g on left:1	
	F on right:0	
	f on right:0	
H on left:2	c on right:1	
R on left:2		
H on	g 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
		right:0
		  ferry is on the left.
		
		  F on left:0
		  f on left:0
		  c on left:0
		  g on left:1
		    F on right:1
		    f on right:1
		    c on right:1
		    g on right:0
		  ferry is on the right.
		
		  F on left:1
		  f on left:0
		  c on left:1
		  g on left:1
		    F on right:0
		    f on right:1
		    c on right:0
		    g on right:0
		  ferry is on the left.	

		F on left:0 f on left:0 c on left:1 g on left:0 F on right:1 f on right:1 c on right:0 g on right:1 ferry is on the right. F on left:1 f on left:0 c on left:1 g on left:0 F on right:0 f on right:1 c on right:0 g on right:1 ferry is on the left. F on left:0 f on left:0 c on left:0	

		g on left:0
		    F on right:1
		    f on right:1
		    c on right:1
		    g on right:1
		ferry is on the right.	

the length of path	7	7	15
the number of nodes expanded	10	9	70

(i) why the maximum length of the OPEN list is more for one algorithm than the other

   Because BFS search uses width to search, which increases the length of the open list. On the other hand, DFS uses the depth to search, so it is arranged in an open list in order of depth. That's why the maximum length of the OPEN list is more for BFS than DFS.

(ii) why the solution PATH length is different for one algorithm from that of the other

   BFS arrives at a goal node via optimal path. However, DFS may arrive at a goal node via very non-optimal path. There are situations DFS can arrive at a goal node by not using the shortest path. That's why sometimes the length of the path of DFS is longer than BFS.