Humans, Robots and Ferry problem:

	the path found from start to goal	the length of the path	the number of nodes expanded
DFS	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: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 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.	9	10

	the path found from start to goal	the length of the path	the number of nodes expanded
BFS	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 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.	7	10

Farmer, Fox, Chicken, and Grain problem:

	the path found from start to goal	the length of the path	the number of nodes expanded
DFS	Farmer on left Fox on left Chicken on left Grain on left. Farmer on right Fox on left Chicken on right Grain on left. Farmer on left Fox on left Chicken on right Grain on left. Farmer on right Fox on left Chicken on right Grain on right. Farmer on left Fox on left Chicken on left Grain on right. Farmer on right Fox on right Chicken on left Grain on right. Farmer on left Fox on right Chicken on left Grain on right. Farmer on right Fox on right Chicken on right Grain on right.	7	7

	the path found from start to goal	the length of the path	the number of nodes expanded
BFS	Farmer on left Fox on left Chicken on left Grain on left. Farmer on right Fox on left Chicken on right Grain on left. Farmer on left Fox on left Chicken on right Grain on left. Farmer on right Fox on left Chicken on right Grain on right. Farmer on left Fox on left Chicken on left Grain on right. Farmer on right Fox on right Chicken on left Grain on right. Farmer on left Fox on right Chicken on left Grain on right. Farmer on right Fox on right Chicken on right Grain on right.	7	9

4-Disk Towers of Hanoi:

	the length of the path	the number of nodes expanded
DFS	40	40
BFS	15	70

DFS solution path:

```
[[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]]
```

BFS solution path:

```
[[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]]      [[] ,[3, 2] ,[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]]
```

The reason DFS has a shorter maximum length of the OPEN list than BFS has:

In DFS, we read the states in depth, so the operator reaches a leaf node at some moment, and the OPEN list will reach its maximum length since if it moves one step further, there will be one state removed from the OPEN list which will reduce the length.

However, in BFS, we can reach all the leaf nodes at the same time and put all the leaf nodes in the OPEN list. Thus, the OPEN list is often quite long in BFS.

The reason BFS has a shorter solution path than DFS:

In DFS, it reads in depth. Thus, in the Hanoi problem, the first peg has a higher priority in reading than the second one and the third one. While in BFS, the nodes at the same level have the same priorities. That's why from the solution path, we have [[4, 3, 1] ,[] ,[2]] after [[4, 3] ,[1] ,[2]] for DFS, but [[4, 3] ,[] ,[2, 1]] after [[4, 3] ,[1] ,[2]] for BFS.