BFS

Question 1

In an office, when someone learns a rumor, they tell all their immediate desk neighbors in 1 hour. Given a seating chart as a graph where edges represent who sits next to whom, find how many hours it takes for a rumor to spread to everyone in the office starting from person X.

Example:

```
   A  B  C  D  E
A [ 0  1  1  0  0 ]
B [ 1  0  0  1  0 ]
C [ 1  0  0  0  1 ]
D [ 0  1  0  0  0 ]
E [ 0  0  1  0  0 ]
```

Answer: 2 hours

Question 2

You have a family tree starting from a grandparent. You need to find how many people are at a specific generation level.

For example:

```
        Grandpa  Dad  Uncle  You  Sister  Cousin
Grandpa [  0     1    1      0    0       0     ]
Dad     [  0     0    0      1    1       0     ]
Uncle   [  0     0    0      0    0       1     ]
You     [  0     0    0      0    0       0     ]
Sister  [  0     0    0      0    0       0     ]
Cousin  [  0     0    0      0    0       0     ]
```

```
  Grandpa
    /   \
  Dad    Uncle
  /  \       \
 You Sister Cousin
```

Given the family tree and a level number, count how many people are at that level.

DFS

Question 1: Underground Tunnel Escape

You're trapped in an underground bunker with 7 rooms. Some rooms have tunnels connecting them. The exit is in Room 7. The matrix shows tunnel connections.

Example:

	R1	R2	R3	R4	R5	R6	R7
R1	0	1	1	0	0	0	0
R2	1	0	0	1	0	0	0
R3	1	0	0	0	1	0	0
R4	0	1	0	0	0	0	0
R5	0	0	1	0	0	1	0
R6	0	0	0	0	1	0	1
R7	0	0	0	0	0	1	0

You're in Room1. Can you escape through Room7? If yes, find one possible escape path.

Answer: Yes, path: R1 → R3 → R5 → R6 → R7

Question 2:

You're in a building with connected rooms. Starting from the entrance, explore all rooms you can reach and list them.

Example:

	Entrance	Hall	Kitchen	Bedroom	Bathroom
Entrance	0	1	1	0	0
Hall	1	0	0	1	0
Kitchen	1	0	0	0	1

Bedroom [0 1 0 0 0]

Bathroom [0 0 1 0 0]

Entrance connects to Hall and Kitchen
Hall connects to Bedroom
Kitchen connects to Bathroom

If you start from Entrance, you can reach: Entrance, Hall, Kitchen, Bedroom, Bathroom (5 rooms total)

Another example:

Entrance connects to Hall

Kitchen connects to Bathroom(make the matrix on your own)

If you start from Entrance, you can reach: Entrance, Hall (2 rooms total) (Kitchen and Bathroom are unreachable)

Given a starting room, find all rooms you can visit.