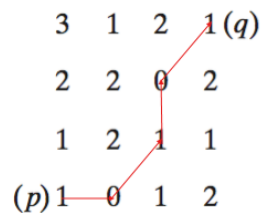Problem 2
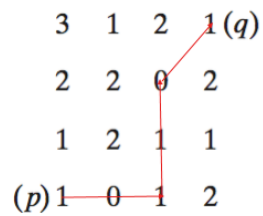
a.

The 4-path does not exist since the 4 adjacencies of **q** are not accessible.

The shortest length of 8-path is 4.

```
3   1   2   1 (q)

2   2   0   2

1   2   1   1

(p) 1   0   1   2
```
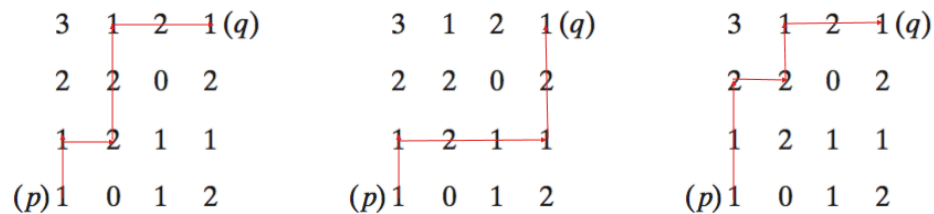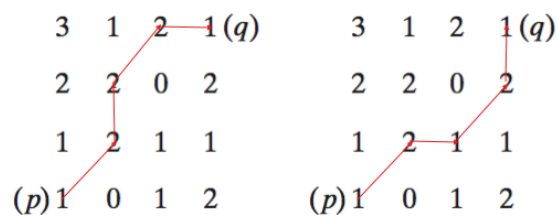
The shortest length of m-path is 5.

```
3   1   2   1 (q)

2   2   0   2

1   2   1   1

(p) 1   0   1   2
```

b.

The shortest length of 4-path is 6.

```
3   1   2   1 (q)      3   1   2   1 (q)      3   1   2   1 (q)

2   2   0   2          2   2   0   2          2   2   0   2

1   2   1   1          1   2   1   1          1   2   1   1

(p) 1   0   1   2      (p) 1   0   1   2      (p) 1   0   1   2
```

The shortest length of 8-path is 4.

```
3   1   2   1 (q)      3   1   2   1 (q)

2   2   0   2          2   2   0   2

1   2   1   1          1   2   1   1

(p) 1   0   1   2      (p) 1   0   1   2
```

The shortest length of m-path is 6.

3	1	2	1 (q)
2	2	0	2
1	2	1	1
(p)1	0	1	2

3	1	2	1 (q)
2	2	0	2
1	2	1	1
(p)1	0	1	2

3	1	2	1 (q)
2	2	0	2
1	2	1	1
(p)1	0	1	2