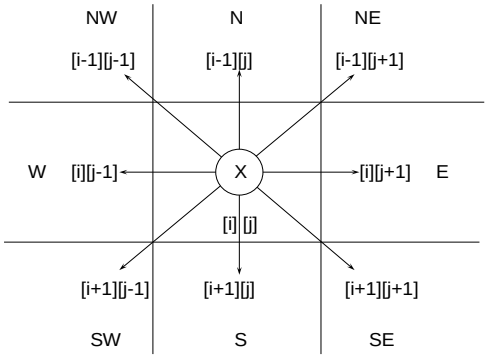
Homework 3: Maze Problem (제출: 4월19일)

문제: 주어진 matrix안에서, stack을 이용하여 길을 찾는 문제임 (시작점과 도착점이 주어짐).

조건:

- 데이터: 주어진 데이터 6x6 matrix 이용. 시작점 (0,0), 도착점(5,5)은 고정되어있음.
- 출력(output): **1) PATH 2) Marked Matrix**
- 현재의 위치 x : maze[i][j]



N	-1	0
NE	-1	1
E	0	1
SE	1	1
S	1	0
SW	1	-1
W	0	-1
NW	-1	-1

<이동 테이블>

알고리즘 (참조):

```
typedef struct {  short int row;  short int col;  short int dir;  } element
typedef struct { short int vert; short int horiz;}offsets;                    // moving direction
offsets move[8];
move[0].vert=-1; move[0].horiz=0;    // N      move[1].vert=-1; move[1].horiz=1;    // NE
move[2].vert=0; move[2].horiz=1;     // E      move[3].vert=1; move[3].horiz=1;     // SE
move[4].vert=1; move[4].horiz=0;     // S      move[5].vert=1; move[5].horiz=-1;    // SW
move[6].vert=0; move[6].horiz=-1;    // W      move[7].vert=-1; move[7].horiz=-1;   // NW

int maze[6][6] = { 0,1,1,1,1,1,   1,0,1,1,1,1,   1,0,0,0,0,1,   1,1,0,1,1,1,   1,0,1,0,0,1,   1,1,1,1,1,0 };
int mark[6][6] = { 0,0,0,0,0,0,   0,0,0,0,0,0,   0,0,0,0,0,0,   0,0,0,0,0,0,   0,0,0,0,0,0,   0,0,0,0,0,0 };
```

1. Start at 0,0: mark[0][0] =10; stack[0].row=1; stack[0].col=1; stack[0].dir=EAST;

2. while (!stack_empty&& !found) {
    temp = POP(top); row = temp.row; col=temp.col; dir=temp.dir;
    while (dir<8 && !found) {
        next_row = row + move[dir].vert; next_col = col + move[dir].horiz;
        if(next_row == 5 && next_col == 5) // reached exit?
            found = 1;
        else if (!maze[next_row][next_col] && !mark[next_row][next_col]) { // new position
            mark[next_row][next_col]=1;
            temp.row = row; temp.col=col; temp.dir=++dir; // store current position
            PUSH(top, temp);
            row=next_row; col = next_col; dir = NORTH; }
        else dir++; // position change } }

3. Print maze
  1) Print Stack (The path) 2) Print Maked maze

***** OUTPUT**

The Path is

row	**col**
0	0
1	1
2	2
2	3
3	2
4	3
4	4
5	5

Marked Matrix

1 0 0 0 0 0
0 1 0 0 0 0
0 0 1 1 1 0
0 0 1 0 0 0
0 0 0 1 1 0
0 0 0 0 0 1