CPSC 1160: ASSIGNMENT 3[25 MARKS]

- Write a program that ask the user for a file
  - That file contains a matrix of numbers
    - The first two lines of the file will be the size of the rows and columns
- Your program should store the values of the matrix of a vectors of int vectors.
- Your program should then find a continuous path thought the matrix starting from a zero and ending at another zero
  - The path sum needs to be greater than zero
  - The one zeros in the path must only be the ones at the start and end.
  - Your program should only move left (col -1), right(col +1), up (row -1) and down (row+1).
  - Your path can only use a position once
- If there is such a path in the matrix, that path should be printed to console, using 'V' for south, '^" for north, '>' for east,'<' for west, 'X' where the path ends, and {'N','E','S','W'} for where the path start. and '-' for all other positions in the matrix.
- The starting character will be an N if the path starting by moving North, E if it starts moving East, S if it starts moving South and W if it starts moving Wes.t
- **You must write a function called path_finder to find the path thought the matrix this function needs be recursive**.

```
Matrix.txt
OG matrix
    5 -10  -1   -5   2
    2    3 -20   2   1
  -13    0   2   3   0
    0    0   5  -4   0
Path matrix
    -    >   >   >   V
    -    ^   -   V   <
    -    N   V   <   -
    -    X   <   -   -
```

```
Name of the file with the matrix
Matrix1.txt
OG matrix
    0    0   0
    0    0   0
    0    0   0
No path found
```

```
Name of the file with the matrix
Matrix2.txt
OG matrix
    1    1    1   -6   -5
   -6   -3   -5    0    4
   -5    1    2   -3   -6
    1    0   -5    0   -4
No path found
```

```
Name of the file with the matrix
Matrix3.txt
OG matrix
    1    1    1   -6   -5
   -6   -3   -5    0    4
   -5    1    2   -2   -6
    1    0   -5    0   -4
Path matrix
    -    -    -    -    -
    -    -    -    S    -
    -    V    <    <    -
    -    X    -    -    -
```

```
Name of the file with the matrix
Matrix4.txt
OG matrix
    0  -10  -10    0    0    0
    1    1    1  -10    0    0
  -10  -10    1  -10  -10    0
    0  -10    1    1    1  -10
    0    0  -10  -10    1    1
    0    0    0    0  -10    0
Path matrix
    S    -    -    -    -    -
    >    >    V    -    -    -
    -    -    V    -    -    -
    -    -    >    >    V    -
    -    -    -    -    >    V
    -    -    -    -    -    X
```

Submissions

Make sure that your code is neat and is well commented

Check that all of your programs work the way they are intended to work by running them with different inputs

Submit to D2L a zip/archive file containing the .cpp and any other files needed to run your program.

If you do not zip your file or if you submit the .class files, you will receive ZERO for this lab (http://www.wikihow.com/Zip-Files-Together)