Ethan Groat
CSM20
3 April 2018

Maze Project – Design Document

Key points

MazeMatrix class – holds an operable version of the maze for the solving algorithm

private members:

vector< vector<char> > vect;
- a two-dimensional vector, in case different sized mazes are used

coordinates start; for quick access at the beginning of solve()
coordinates current; for current position in matrix/onscreen
stack<coordinates> crumbs; stack of coordinates for backtracking

private methods:

parse(string); to read a string into the 2D vector vect
advance(); move through maze one step, called by solve()

public methods:

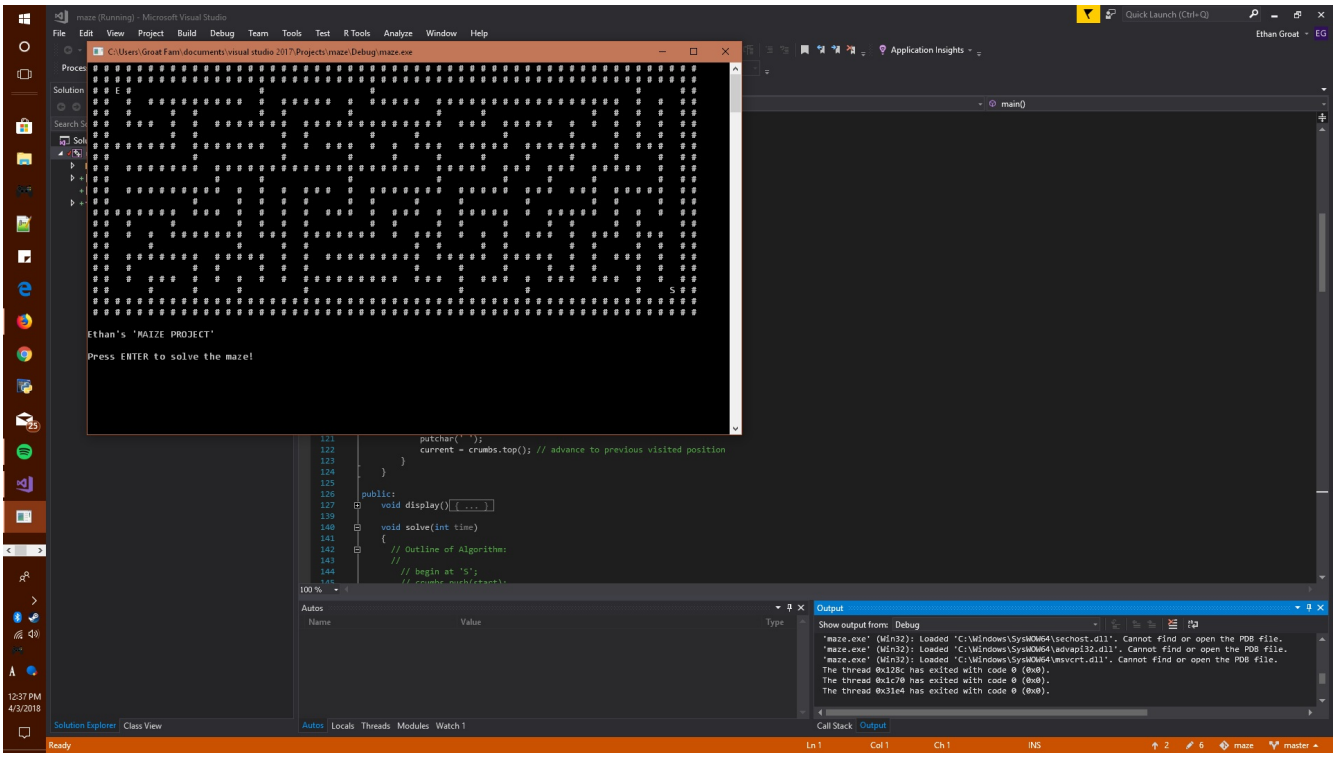
display(); displays the whole matrix, called at the beginning of main()
solve(); main algorithm

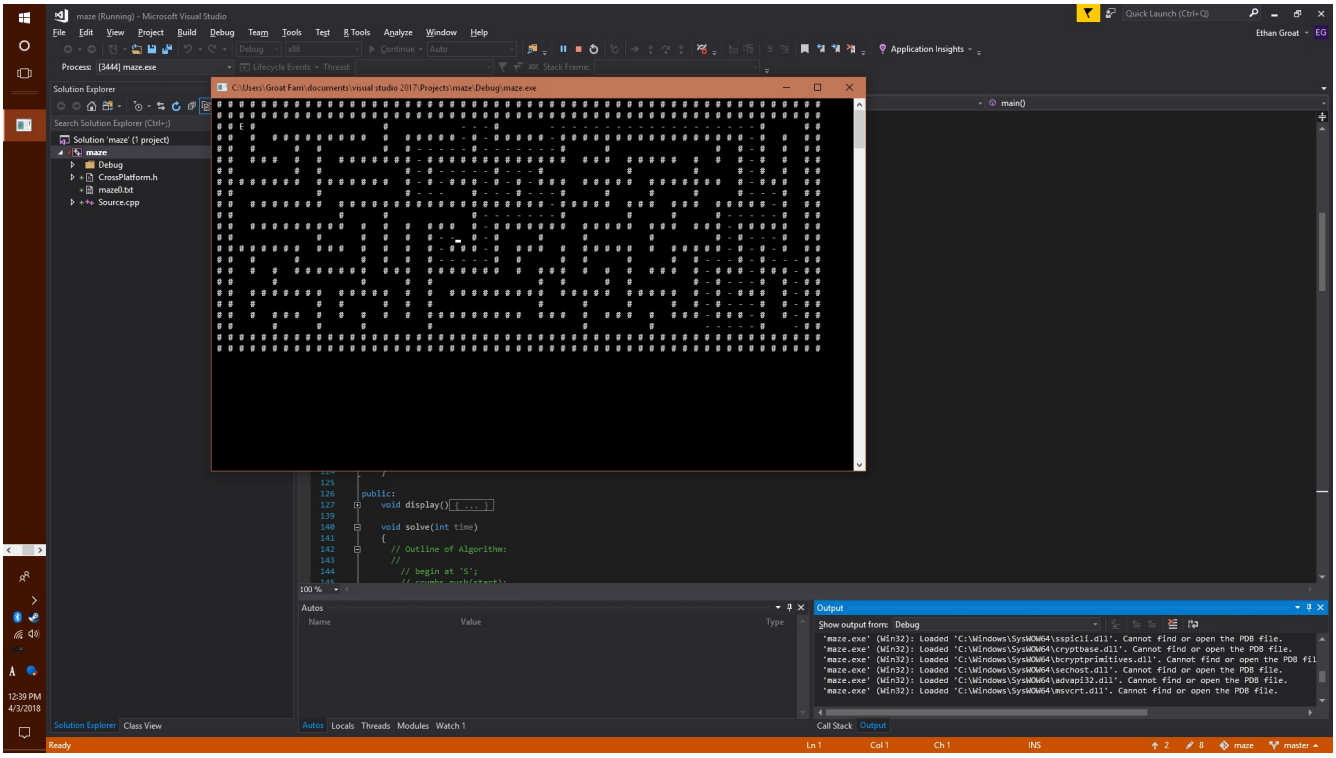
Outline of Maze Algorithm:

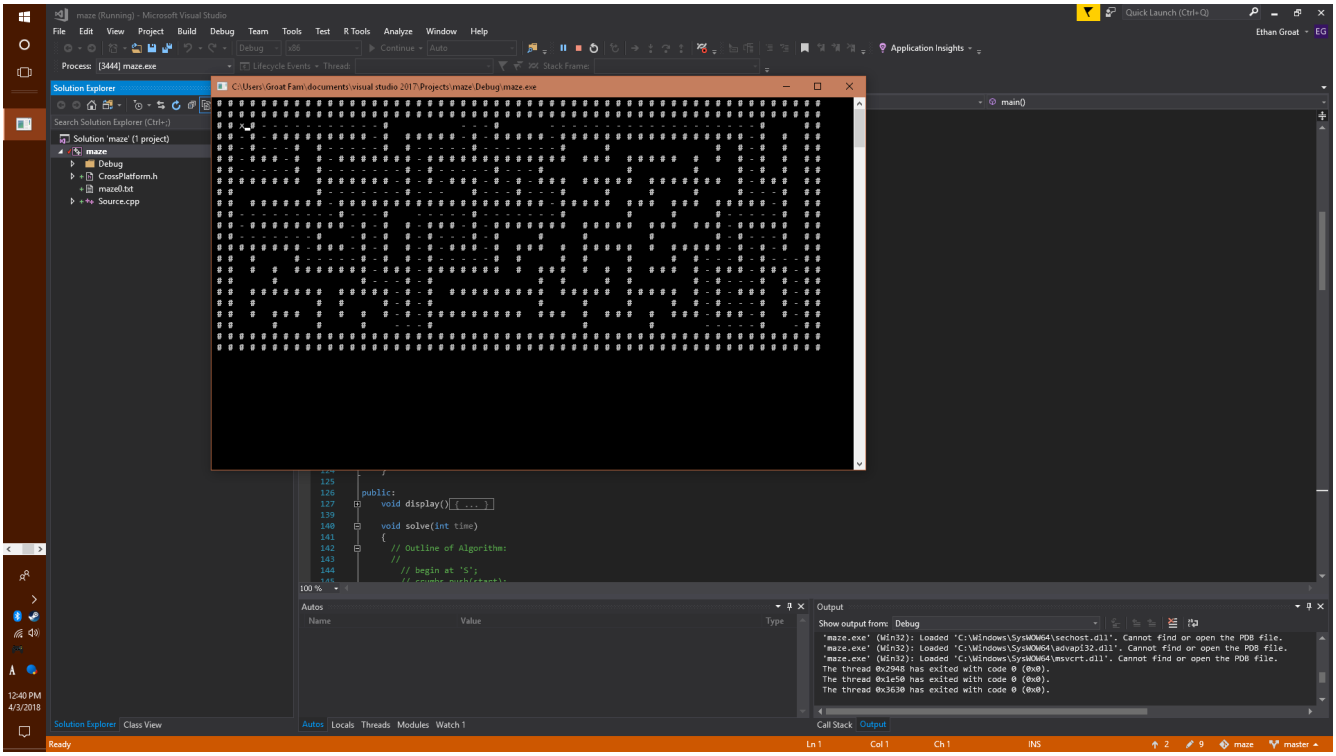
```
begin at 'S';
crumbs.push(start);
while (!'E' at current position in MazeArray M):
        put '-' onscreen;  sidenote: put a face like " '-' "
        record 'v' at current position in M;
        time delay;
        erase face, if used;

        advance:
                (check available routes in M & proceed to first condition)
                1: up is ' ' or 'E'         -> current = up;        crumbs.push(current);
                2: left is ' ' or 'E'       -> current = left;      crumbs.push(current);
                3: down is ' ' or 'E'       -> current = down;      crumbs.push(current);
                4: right is ' ' or 'E'      -> current = right;     crumbs.push(current);
                5: nothing is ' ' or 'E'    -> backtrack
                                                crumbs.pop();
                                                put ' ';
                                                current = crumbs.top();
solved -> mark the endpoint
```

Screenshots:






maze (Running) - Microsoft Visual Studio
File Edit View Project Build Debug Team Tools Test R Tools Analyze Window Help
Ethan Groat
Process: [3444] maze.exe
Solution Explorer
Search Solution Explorer (Ctrl+;)
Solution 'maze' (1 project)
maze
Debug
CrossPlatform.h
maze0.txt
Source.cpp
C:\Users\Groat Farm\documents\visual studio 2017\Projects\maze\Debug\maze.exe
main()
public:
void display()
void solve(int time)
// Outline of Algorithm:
// begin at 'S';
100 %
Autos
Name
Value
Type
Output
Show output from: Debug
'maze.exe' (Win32): Loaded 'C:\Windows\SysWOW64\sechost.dll'. Cannot find or open the PDB file.
'maze.exe' (Win32): Loaded 'C:\Windows\SysWOW64\advapi32.dll'. Cannot find or open the PDB file.
'maze.exe' (Win32): Loaded 'C:\Windows\SysWOW64\msvcrt.dll'. Cannot find or open the PDB file.
The thread 0x2948 has exited with code 0 (0x0).
The thread 0x1e50 has exited with code 0 (0x0).
The thread 0x3630 has exited with code 0 (0x0).
Solution Explorer
Class View
Autos
Locals
Threads
Modules
Watch 1
Call Stack
Output
Ready
Ln 1
Col 1
Ch 1
INS
maze
master
12:40 PM
4/3/2018