```
Script started on 2024-03-21 16:47:09-05:00 [TERM="xterm-256color" TTY="/dev/pts/0" COLUMNS="348" LINES="65"]
[?2004h(base) ]0;jovyan@jupyter-tes4j: ~/CS2/Lab/Lab_13[01;32mjovyan@jupyter-tes4j[00m:[01;34m~/CS2/Lab/Lab_13[00m$ pwd
[?2004l
/home/jovyan/CS2/Lab/Lab_13
[?2004h(base) ]0;jovyan@jupyter-tes4j: ~/CS2/Lab/Lab_13[01;32mjovyan@jupyter-tes4j[00m:[01;34m~/CS2/Lab/Lab_13[00m$ -[Kla[Ks
-la
[?2004l
total 84
drwxr-sr-x  3 jovyan users  4096 Mar 21 16:47 [0m[01;34m.[0m
drwxr-sr-x 16 jovyan users  4096 Mar 15 14:40 [01;34m..[0m
-rw-r--r--  1 jovyan users  6951 Mar 21 16:43 Board.cpp
-rw-r--r--  1 jovyan users   660 Mar 21 09:36 board.h
drwxr-sr-x  2 jovyan users  4096 Mar 15 16:24 [01;34m.ipynb_checkpoints[0m
-rw-r--r--  1 jovyan users   246 Mar 21 16:28 minesweeper.cpp
-rw-r--r--  1 jovyan users  5545 Mar 15 16:26 Sabin_Lab_13.log
-rw-r--r--  1 jovyan users 21191 Mar 15 16:27 Sabin_Lab_13.pdf
-rw-r--r--  1 jovyan users     0 Mar 21 16:47 Sabin_Lab_14.log
-rwxr-xr-x  1 jovyan users 22088 Mar 21 16:43 [01;32msweep[0m
[?2004h(base) ]0;jovyan@jupyter-tes4j: ~/CS2/Lab/Lab_13[01;32mjovyan@jupyter-tes4j[00m:[01;34m~/CS2/Lab/Lab_13[00m$ cat -n
Board.h
[?2004l
cat: Board.h: No such file or directory
[?2004h(base) ]0;jovyan@jupyter-tes4j: ~/CS2/Lab/Lab_13[01;32mjovyan@jupyter-tes4j[00m:[01;34m~/CS2/Lab/Lab_13[00m$ cat -n
board.h
[?2004l
     1  #ifndef BOARD_H
     2  #define BOARD_H
     3  #include <array>
     4
     5  const int kRowSize {8};
     6  const int kColSize {8};
     7
     8  class Board{
     9  private:
    10      std::array< std::array< char, kColSize>, kRowSize> arrBoard{};
    11      int mine_count{};
    12
    13  public:
    14      //default constructor
    15      Board();
    16      //function called place_mines; will randomly place mines on a board
    17      void place_mines();
    18      //function called update_counts; will show the amount of mines near the tile
    19      void update_counts();
    20      //function called revealed_board to display the board in 2-d fasshion
    21      void revealed_board();
    22
    23      //default destructor
    24      ~Board(){
    25          std::cout << "Board revealed\n";
    26      }
    27  };
    28
    29
    30  #endif[?2004h(base) ]0;jovyan@jupyter-tes4j: ~/CS2/Lab/Lab_13[01;32mjovyan@jupyter-
tes4j[00m:[01;34m~/CS2/Lab/Lab_13[00m$ cat -n b[KBoard.cpp
[?2004l
     1  #include <iostream>
     2  #include "board.h"
     3  #include <cstdlib>
     4  #include <ctime>
     5  #include <iomanip>
     6
     7
     8  //Loop through the array, and set the index to 0
     9  //Initialize mine_count to 10
    10  Board::Board(){
    11      for(int i{0}; i < kRowSize; i++){
    12          for(int j{0}; j < kColSize; j++){
    13              arrBoard[i][j] = '0';
    14          }
    15      }
    16
    17      mine_count = 10;
    18  }
    19
    20  void Board::place_mines(){
    21      //Seed the random number generator
    22      std::srand(static_cast<unsigned int>(std::time(nullptr)));
    23
    24      for(int i{0}; i < mine_count; i++){
    25          //Produce a random row and col
    26          int row = std::rand() % kRowSize;
```

```cpp
27          int col = std::rand() % kColSize;
28
29          //Check to see if the index is already a mine
30          if(arrBoard[row][col] != 'M'){
31              //If a mine is not present, place the mine
32              arrBoard[row][col] = 'M';
33          } else{
34              //If no mine is placed, subtract one
35              //As we did not place a mine
36              i--;
37          }
38      }
39
40  }
41
42  //Loop through the array, print out the index
43  void Board::revealed_board(){
44      for(int i{0}; i < kRowSize; i++){
45          std::cout << "|---|---|---|---|---|---|---|---|\n";
46          for(int j{0}; j < kColSize; j++){
47              std::cout << '|' <<std::setw(2) << arrBoard[i][j] << ' ' ;
48          }
49          std::cout << '|' << '\n';
50      }
51      std::cout << "|---|---|---|---|---|---|---|---|\n";
52  }
53
54  void Board::update_counts(){
55      for(int row{0}; row < kRowSize; row++){
56          for(int col{0}; col < kColSize; col++){
57              int count{0};
58              if(arrBoard[row][col] != 'M'){
59                  //if row is 0
60                  if(row == 0){
61                      //if col is 0
62                      if(col == 0){
63                          //you can chck one row below, below to right, and right
64                          if (arrBoard.at(row+1).at(col) == 'M') {count += 1;}
65                          if (arrBoard.at(row+1).at(col+1) == 'M') {count += 1;}
66                          if (arrBoard.at(row).at(col+1)== 'M') {count += 1;}
67                          arrBoard[row][col] = static_cast<char>(count + '0');
68                          //else if col is 7;
69                      }else if(col == 7){
70                          //you can check one row below, below to the left, and the left
71                          if (arrBoard.at(row+1).at(col) == 'M') {count += 1;}
72                          if (arrBoard.at(row+1).at(col-1) == 'M') {count += 1;}
73                          if (arrBoard.at(row).at(col-1)== 'M') {count += 1;}
74                          arrBoard[row][col] = static_cast<char>(count + '0');
75                           //else
76                      }else{
77                          //you can check one row below (r/l/c), and l/r
78                          if (arrBoard.at(row+1).at(col) == 'M') {count += 1;}
79                          if (arrBoard.at(row+1).at(col-1) == 'M') {count += 1;}
80                          if (arrBoard.at(row+1).at(col+1) == 'M') {count += 1;}
81                          if (arrBoard.at(row).at(col+1)== 'M') {count += 1;}
82                          if (arrBoard.at(row).at(col-1)== 'M') {count += 1;}
83                          arrBoard[row][col] = static_cast<char>(count + '0');
84                      }
85                      //else if row is 7
86                  }else if(row == 7){
87                      //if col is 0
88                      if(col == 0){
89                          //you can check up a row, up to the right, and right
90                          if (arrBoard.at(row-1).at(col) == 'M') {count += 1;}
91                          if (arrBoard.at(row-1).at(col+1) == 'M') {count += 1;}
92                          if (arrBoard.at(row).at(col+1)== 'M') {count += 1;}
93                          arrBoard[row][col] = static_cast<char>(count + '0');
94                          //else if col is 7
95                      }else if(col == 7){
96                          //you can check up a row, up to the left, and to the left
97                          if (arrBoard.at(row-1).at(col) == 'M') {count += 1;}
98                          if (arrBoard.at(row-1).at(col-1) == 'M') {count += 1;}
99                          if (arrBoard.at(row).at(col-1)== 'M') {count += 1;}
100                         arrBoard[row][col] = static_cast<char>(count + '0');
101                         //else you can check up a row(r/l/c) and l/r
102                     }else{
103                         if (arrBoard.at(row-1).at(col) == 'M') {count += 1;}
104                         if (arrBoard.at(row-1).at(col-1) == 'M') {count += 1;}
105                         if (arrBoard.at(row-1).at(col+1) == 'M') {count += 1;}
106                         if (arrBoard.at(row).at(col+1)== 'M') {count += 1;}
107                         if (arrBoard.at(row).at(col-1)== 'M') {count += 1;}
108                         arrBoard[row][col] = static_cast<char>(count = '0');
109                     }
```

```
110                         //else
111                     }else{
112                         //if col is 0
113                         if(col == 0){
114                             //you can check up/down center, up/down to the right, and to the right
115                             if (arrBoard.at(row+1).at(col) == 'M') {count += 1;}
116                             if (arrBoard.at(row+1).at(col+1) == 'M') {count += 1;}
117                             if (arrBoard.at(row-1).at(col) == 'M') {count += 1;}
118                             if (arrBoard.at(row-1).at(col+1) == 'M') {count += 1;}
119                             if (arrBoard.at(row).at(col+1)== 'M') {count += 1;}
120                             arrBoard[row][col] = static_cast<char>(count + '0');
121                         //else if col is 7
122                         }else if(col == 7){
123                             //you can check up/down center, up/down to the left, and to the left
124                             if (arrBoard.at(row+1).at(col-1) == 'M') {count += 1;}
125                             if (arrBoard.at(row+1).at(col) == 'M') {count += 1;}
126                             if (arrBoard.at(row-1).at(col-1) == 'M') {count += 1;}
127                             if (arrBoard.at(row-1).at(col) == 'M') {count += 1;}
128                             if (arrBoard.at(row).at(col-1) == 'M') {count += 1;}
129                             arrBoard[row][col] = static_cast<char>(count + '0');
130                         }else{
131                             //check up/down (r/l/c) and r/l
132                             if (arrBoard.at(row+1).at(col-1) == 'M') {count += 1;}
133                             if (arrBoard.at(row+1).at(col) == 'M') {count += 1;}
134                             if (arrBoard.at(row+1).at(col+1) == 'M') {count += 1;}
135                             if (arrBoard.at(row).at(col-1) == 'M') {count += 1;}
136                             if (arrBoard.at(row).at(col+1)== 'M') {count += 1;}
137                             if (arrBoard.at(row-1).at(col-1) == 'M') {count += 1;}
138                             if (arrBoard.at(row-1).at(col) == 'M') {count += 1;}
139                             if (arrBoard.at(row-1).at(col+1) == 'M') {count += 1;}
140                             arrBoard[row][col] = static_cast<char>(count + '0');
141                         }
142                     }
143                 }
144             }
145         }
146 }                   [?2004h(base) ]0;jovyan@jupyter-tes4j: ~/CS2/Lab/Lab_13[01;32mjovyan@jupyter-
tes4j[00m:[01;34m~/CS2/Lab/Lab_13[00m$ cat -n minesweeper.cpp
[?2004l
     1  #include <iostream>
     2  #include "board.h"
     3  #include <cstdlib>
     4  #include <ctime>
     5  #include <iomanip>
     6
     7  int main(){
     8
     9      Board sampleBoard;
    10
    11      sampleBoard.place_mines();
    12      sampleBoard.update_counts();
    13      sampleBoard.revealed_board();
    14
    15      return 0;
    16  }[?2004h(base) ]0;jovyan@jupyter-tes4j: ~/CS2/Lab/Lab_13[01;32mjovyan@jupyter-tes4j[00m:[01;34m~/CS2/Lab/Lab_13[00m$
g++ -Wall -Wextra -Werror minesweeper.cpp Board.cpp -o sweep
[?2004l
[?2004h(base) ]0;jovyan@jupyter-tes4j: ~/CS2/Lab/Lab_13[01;32mjovyan@jupyter-tes4j[00m:[01;34m~/CS2/Lab/Lab_13[00m$ ./sweep
[?2004l
|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 1 | M | 1 |
|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 1 | 3 | 3 | 2 |
|---|---|---|---|---|---|---|---|
| 0 | 1 | 1 | 1 | 2 | M | M | 1 |
|---|---|---|---|---|---|---|---|
| 1 | 2 | M | 1 | 2 | M | 3 | 1 |
|---|---|---|---|---|---|---|---|
| 1 | M | 2 | 1 | 1 | 1 | 1 | 0 |
|---|---|---|---|---|---|---|---|
| 2 | 2 | 2 | 0 | 1 | 2 | 2 | 1 |
|---|---|---|---|---|---|---|---|
| 1 | M | 1 | 1 | 2 | M | M | 1 |
|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | M | 0 | 0 | 1 |
|---|---|---|---|---|---|---|---|
Board revealed
[?2004h(base) ]0;jovyan@jupyter-tes4j: ~/CS2/Lab/Lab_13[01;32mjovyan@jupyter-tes4j[00m:[01;34m~/CS2/Lab/Lab_13[00m$ ./sweep
[?2004l
|---|---|---|---|---|---|---|---|
| M | 1 | 0 | 0 | 0 | 1 | M | 1 |
|---|---|---|---|---|---|---|---|
| 2 | 2 | 0 | 1 | 1 | 2 | 1 | 1 |
```

```
|---|---|---|---|---|---|---|---|
| M | 1 | 0 | 1 | M | 1 | 0 | 0 |
|---|---|---|---|---|---|---|---|
| 2 | 2 | 0 | 1 | 2 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|
| M | 2 | 1 | 0 | 1 | M | 1 | 0 |
|---|---|---|---|---|---|---|---|
| 3 | M | 2 | 0 | 1 | 1 | 1 | 0 |
|---|---|---|---|---|---|---|---|
| 2 | M | 3 | 2 | 1 | 1 | 0 | 0 |
|---|---|---|---|---|---|---|---|
| 1 | 0 | M | 0 | M | 0 | 0 | 0 |
|---|---|---|---|---|---|---|---|
Board revealed
[?2004h(base) ]0;jovyan@jupyter-tes4j: ~/CS2/Lab/Lab_13[01;32mjovyan@jupyter-tes4j[00m:[01;34m~/CS2/Lab/Lab_13[00m$ ./sweep
[?2004l
|---|---|---|---|---|---|---|---|
| M | 1 | 0 | 1 | M | 2 | 2 | M |
|---|---|---|---|---|---|---|---|
| 2 | 2 | 0 | 1 | 1 | 2 | M | 2 |
|---|---|---|---|---|---|---|---|
| M | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
|---|---|---|---|---|---|---|---|
| 1 | 1 | 1 | M | 1 | 0 | 1 | 1 |
|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 1 | 1 | 0 | 2 | M |
|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 1 | 4 | M |
|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 1 | M | M |
|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
|---|---|---|---|---|---|---|---|
Board revealed
[?2004h(base) ]0;jovyan@jupyter-tes4j: ~/CS2/Lab/Lab_13[01;32mjovyan@jupyter-tes4j[00m:[01;34m~/CS2/Lab/Lab_13[00m$ ./sweep
[?2004l
|---|---|---|---|---|---|---|---|
| 0 | 1 | M | 2 | M | 1 | 0 | 0 |
|---|---|---|---|---|---|---|---|
| 0 | 1 | 1 | 3 | 2 | 3 | 1 | 1 |
|---|---|---|---|---|---|---|---|
| 0 | 1 | 1 | 2 | M | 2 | M | 1 |
|---|---|---|---|---|---|---|---|
| 0 | 1 | M | 2 | 2 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|
| 0 | 1 | 1 | 1 | 1 | M | 1 | 0 |
|---|---|---|---|---|---|---|---|
| 1 | 1 | 1 | 1 | 2 | 1 | 1 | 0 |
|---|---|---|---|---|---|---|---|
| M | 1 | 1 | M | 2 | 1 | 1 | 1 |
|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | M | 0 | 0 | M |
|---|---|---|---|---|---|---|---|
Board revealed
[?2004h(base) ]0;jovyan@jupyter-tes4j: ~/CS2/Lab/Lab_13[01;32mjovyan@jupyter-tes4j[00m:[01;34m~/CS2/Lab/Lab_13[00m$ ./sweep
[?2004l
|---|---|---|---|---|---|---|---|
| M | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
|---|---|---|---|---|---|---|---|
| 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 1 | 1 | 2 | 1 |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 1 | 1 | M | 2 | M |
|---|---|---|---|---|---|---|---|
| M | 2 | M | 1 | 2 | 2 | 3 | 1 |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 2 | 2 | 3 | M | 2 | 0 |
|---|---|---|---|---|---|---|---|
| 0 | 1 | 3 | M | 4 | M | 2 | 0 |
|---|---|---|---|---|---|---|---|
| 0 | 0 | M | M | 0 | 0 | 0 | 0 |
|---|---|---|---|---|---|---|---|
Board revealed
[?2004h(base) ]0;jovyan@jupyter-tes4j: ~/CS2/Lab/Lab_13[01;32mjovyan@jupyter-tes4j[00m:[01;34m~/CS2/Lab/Lab_13[00m$ exit
[?2004l
exit

Script done on 2024-03-21 16:48:45-05:00 [COMMAND_EXIT_CODE="0"]
```