

Script started on 2024-07-15 21:06:19-05:00 [TERM="xterm-256color" TTY="/dev/pts/0"]
dg46622@ares:~/sheep\$ pwd
/home/students/dg46622/sheep
dg46622@ares:~/sheep\$ cat sheep.info

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CSC122-001

Project: Where, oh where, has my little SHEEP gone?! - Level: 6
Total Levels: 6

Description:

The following program creates a word search from a file that contains a list of words. The program contains a class that makes a grid of letters and manages them as well. When the user enters an invalid file, it will prompt the user to enter another file name. Once the user enters a valid file name they now can play the game. The user is asked to enter a word they're searching for, a starting position (x & y-coordinates), and a cardinal direction (N, SE, W, etc). If a word from the list is found, the program will capitalize it in the word search. Once there's no more words on the list, then the game ends.

dg46622@ares:~/sheep\$ cat words.txt
blueberry
banana
apple
cabbage
carrot
strawberry
pear
onion
watermelon
bread
toast
butter
spinach
celery
grape
mango
pineapple
carbon
oxygen
radon
lithium
neon
boron
helium
bromine
argon
tin
iodine
sodium

calcium
potassium
sulfur
nitrogen
chlorine
dg46622@ares:~/sheep\$ show-code search.h search.cpp sheep.cpp

search.h:

```
1  #pragma once
2  #include <memory>
3  #include <vector>
4  #include <fstream>
5  #include <iomanip>
6  #include <iostream>
7  #include <random>
8  #include <algorithm>
9
10 class lettergrid
11 {
12     size_t row{0};
13     size_t column{0};
14     std::vector<bool> word_found;
15     std::unique_ptr<char*> letter;
16     std::unique_ptr<char*> grid;
17
18 public:
19
20     const std::vector<bool>& getWordFound() const
21     {
22         return word_found;
23     }
24
25     lettergrid(size_t max_length);
26
27     lettergrid(const lettergrid& a);
28
29     lettergrid& operator=(const lettergrid& a) = delete;
30
31     void chooseorien(std::vector<std::string>& wordlist,
32                     std::mt19937 randomnum);
33
34     bool placeword(short pitx, short pity, std::size_t positx,
35                   std::size_t posity, std::string word);
36
37     void disp();
38
39 }
```

```

44
45     void insertspace(std::mt19937& randomnum);
46
47
48     bool checkword(std::string guess, std::size_t positx,
49     std::size_t posity, std::string direct,
50     std::vector<std::string>& wordlist);
51
52
53     void choosedir(short dir, short& dx, short& dy);
54
55
56     ~lettergrid();
57 };
58
59 std::string randomword(std::istream& file, std::size_t maxline,
60 std::mt19937& randomnum);
61
62
63 void deletevec(std::vector<std::string>& vec, std::size_t i);

```

search.cpp:

```

1  #include "search.h"
2  #include <algorithm>
3  #include <map>
4
5  lettergrid::lettergrid(size_t max_length)
6      : row(max_length + 2), column(max_length + 2), word_found(),
7      letter(new char[row * column]), grid(new char*[row])
8  {
9      for (size_t i = 0; i < row; i++)
10     {
11         grid[i] = letter.get() + i * column;
12     }
13
14     for (size_t a = 0; a < row; a++)
15     {
16         for (size_t b = 0; b < column; b++)
17         {
18             grid[a][b] = '*';
19         }
20     }
21 }
22
23
24 lettergrid::lettergrid(const lettergrid& a)
25     : row(a.row), column(a.column), word_found(a.word_found),
26     letter(new char[a.row * a.column]), grid(new char*[a.row])
27 {
28     for (size_t i = 0; i < row; i++)
29     {

```

```

30         grid[i] = letter.get() + i * column;
31         std::copy(a.grid[i], a.grid[i] + column, grid[i]);
32     }
33 }
34
35
36 void lettergrid::chooseorien(std::vector<std::string>& wordlist,
37 std::mt19937 randomnum)
38 {
39     const short triesmax = 100;
40     short tries;
41     short orien;
42     short dx = 0;
43     short dy = 0;
44     std::size_t x = 0;
45     std::size_t y = 0;
46     std::size_t listend = wordlist.size();
47     std::uniform_int_distribution<short> rangeorien(1, 8);
48     std::uniform_int_distribution<std::size_t> rangeplace(0, row);
49
50     word_found.assign(listend, false);
51
52     for (std::size_t a = 0; a < listend; a++)
53     {
54         tries = 0;
55
56         do
57         {
58             orien = rangeorien(randomnum);
59             choosedir(orien, dx, dy);
60             x = rangeplace(randomnum);
61             y = rangeplace(randomnum);
62             tries++;
63         }
64
65         while (!placeword(dx, dy, x, y, wordlist[a]) && tries != triesmax)
66
67         if (tries == triesmax)
68         {
69             deletevec(wordlist, a);
70             listend--;
71         }
72     }
73 }
74
75
76 bool lettergrid::placeword(short pitx, short pity, std::size_t positx,
77 std::size_t posity, std::string word)
78 {
79     std::size_t wordlength = word.length();
80     short wordendx = static_cast<short>(positx + pitx * wordlength);
81     short wordendy = static_cast<short>(posity + pity * wordlength);
82
83     if (wordendy > static_cast<short>(row - 1) ||

```

```

84     wordendx > static_cast<short>(column - 1) ||
85     wordendy < 0 ||
86     wordendx < 0 || posity > row - 1 ||
87     positx > row - 1)
88 {
89     return false;
90 }
91
92 else
93 {
94     for (std::size_t i = 0; i < wordlength; i++)
95     {
96         if (grid[pity * i + posity][pitx * i + positx] !=
97             word[i] &&
98             grid[pity * i + posity][pitx * i + positx] != '*')
99         {
100             return false;
101         }
102     }
103
104     for (std::size_t i = 0; i < wordlength; i++)
105     {
106         grid[pity * i + posity][pitx * i + positx] =
107             word[i];
108     }
109     return true;
110 }
111 }
112
113
114 void lettergrid::insertspace(std::mt19937& randomnum)
115 {
116     std::uniform_int_distribution<int> distribution('a', 'z');
117
118     for (std::size_t a = 0; a < row; a++)
119     {
120         for (std::size_t b = 0; b < row; b++)
121         {
122             if (grid[a][b] == '*')
123             {
124                 grid[a][b] =
125                     static_cast<char>(distribution(randomnum));
126             }
127         }
128     }
129 }
130
131
132 std::string randomword(std::istream& file, std::size_t maxline,
133 std::mt19937& randomnum)
134 {
135     std::string word;
136     std::uniform_int_distribution<long> distribution(0,
137 maxline);

```

```

138     std::size_t random = distribution(randomnum);
139     file.seekg(0);
140
141     for (std::size_t i = 0; i < random; i++)
142     {
143         file.ignore(std::numeric_limits<std::streamsize>::max(), '\n');
144     }
145
146     std::getline(file, word);
147     std::size_t wordlength = word.length();
148
149     for (std::size_t a = 0; a < wordlength; a++)
150     {
151         word[a] = static_cast<char>(std::tolower(word[a]));
152     }
153     return word;
154 }
155
156
157 void lettergrid::choosedir(short dir, short& dx, short& dy)
158 {
159     static const std::map<short, std::pair<short, short>> dirMap =
160     {
161         {1, {1, 0}}, {2, {-1, 0}}, {3, {0, -1}}, {4, {0, 1}},
162         {5, {-1, -1}}, {6, {1, -1}}, {7, {-1, 1}}, {8, {1, 1}}
163     };
164
165     auto it = dirMap.find(dir);
166
167     if (it != dirMap.end())
168     {
169         dx = it->second.first;
170         dy = it->second.second;
171     }
172 }
173
174
175 bool lettergrid::checkword(std::string guess, std::size_t positx,
176 std::size_t posity, std::string direct, std::vector<std::string>& wordlist)
177 {
178     short dx = 0, dy = 0;
179     short dir = 0;
180     std::size_t listend = wordlist.size();
181     std::size_t guesslength = guess.length();
182     bool inlist = false;
183     std::size_t b;
184
185     for (std::size_t a = 0; a < guesslength; a++)
186     {
187         guess[a] = static_cast<char>(std::tolower(guess[a]));
188     }
189
190     for (b = 0; b < listend; b++)
191     {

```

```

192     if (guess == wordlist[b])
193     {
194         inlist = true;
195         break;
196     }
197 }
198
199 if (inlist)
200 {
201     if (direct[0] == 'N')
202     {
203         if (direct == "NW")
204         {
205             dir = 5;
206         }
207
208         else if (direct == "NE")
209         {
210             dir = 6;
211         }
212
213         else
214         {
215             dir = 3;
216         }
217     }
218
219     else if (direct[0] == 'S')
220     {
221         if (direct == "SW")
222         {
223             dir = 7;
224         }
225
226         else if (direct == "SE")
227         {
228             dir = 8;
229         }
230
231         else
232         {
233             dir = 4;
234         }
235     }
236 }
237
238 else if (direct == "E")
239 {
240     dir = 1;
241 }
242
243 else if (direct == "W")
244 {
245     dir = 2;

```

```

246     }
247
248     choosedir(dir, dx, dy);
249
250     if ((posity + dy * guesslength) > row - 1 ||
251         (positx + dx * guesslength) > column - 1 ||
252         static_cast<short>(positx + dx * guesslength) < 0 ||
253         static_cast<short>(posity + dy * guesslength) < 0)
254     {
255         return false;
256     }
257
258     else
259     {
260         for (std::size_t a = 0; a < guesslength; a++)
261         {
262             if (std::toupper(grid[positx + dx * a][posity + dy * a])
263                 != std::toupper(guess[a]))
264             {
265                 return false;
266             }
267         }
268
269         for (std::size_t a = 0; a < guesslength; a++)
270         {
271             grid[positx + dx * a][posity + dy * a]
272                 = static_cast<char>(std::toupper(guess[a]));
273         }
274
275         word_found[b] = true;
276         return true;
277     }
278 }
279
280 else
281 {
282     return false;
283 }
284 }
285
286 void lettergrid::disp()
287 {
288     std::cout << "   X ";
289
290     for (std::size_t a = 0; a < row; a++)
291     {
292         std::cout << std::setw(4) << a + 1;
293     }
294
295     std::cout << "\n Y\n";
296
297     for (std::size_t a = 0; a < column; a++)
298     {
299

```

```

300     std::cout << std::setw(2) << a + 1 << std::setw(4);
301
302     for (std::size_t b = 0; b < row; b++)
303     {
304         std::cout << grid[b][a] << "  ";
305     }
306     std::cout << "\n\n";
307 }
308 }
309 }
310
311 lettergrid::~lettergrid() {}
312
313 void deletevec(std::vector<std::string>& vec, std::size_t i)
314 {
315     vec[i] = vec.back();
316     vec.pop_back();
317 }

```

sheep.cpp:

```

1  #include "search.h"
2  #include <iostream>
3  #include <fstream>
4  #include <string>
5  #include <random>
6  #include <limits>
7
8  using namespace std;
9
10 void openfile(ifstream& a, string name);
11 size_t maxline(ifstream& a);
12 size_t longword(vector<string> a);
13
14
15 int main()
16 {
17     size_t wordnum;
18     size_t wordmaxlen;
19     size_t maxlines;
20     vector<string> words;
21     string filename;
22     ifstream file;
23     mt19937 randomnum;
24     randomnum.seed(random_device());
25
26     cout << "\nWelcome To Word Search!!";
27     cout << "\n\nHow many words would you like?\n";
28     cin >> wordnum;
29
30     openfile(file, filename);
31     maxlines = maxline(file);

```

```

32     file.clear();
33
34     for (size_t i = 0; i < wordnum; i++)
35     {
36         words.push_back(randomword(file, maxlines, randomnum));
37     }
38
39     wordmaxlen = longword(words);
40     lettergrid wordgrid(wordmaxlen);
41     wordgrid.chooseorien(words, randomnum);
42
43     for (size_t a = 0; a < words.size(); a++)
44     {
45         cout << words[a] << endl;
46     }
47
48     wordgrid.insertspace(randomnum);
49     wordgrid.disp();
50
51     string guess;
52     string direct;
53     size_t xposition;
54     size_t yposition;
55
56     while (any_of(wordgrid.getWordFound().begin(),
57 wordgrid.getWordFound().end(), [](bool found) { return !found; })))
58     {
59         cout << "\n\nEnter a Word, X-Coordinate, Y-Coordinate, ";
60         cout << "and Direction.\nDirection In form N, NW, SW, etc.";
61         cout << "\nEXAMPLE: apple 1 7 N\n";
62
63         cin >> guess >> xposition >> yposition >> direct;
64         cout << "\n\n";
65         wordgrid.checkword(guess, xposition - 1, yposition - 1, direct, words);
66
67         for (size_t a = 0; a < words.size(); a++) {
68             cout << words[a] << endl;
69         }
70         wordgrid.disp();
71     }
72     cout << "\n\nGAME OVER!!! You Found All the Words!!\n\n";
73     file.close();
74     file.clear();
75 }
76
77
78 void openfile(ifstream& a, string name)
79 {
80     bool okay = false;
81
82     while (!okay)
83     {
84         cout << "\n\nEnter File Name To Get Words From:\n";
85         cin >> name;

```

```

86     cout << "\n\n";
87     a.open(name);
88
89     if (!a)
90     {
91         cout << "ERROR OPENING FILE!! ENTER AGAIN!\n\n";
92     }
93     else
94     {
95         okay = true;
96     }
97 }
98 }
99
100
101 size_t maxline(istream& a)
102 {
103     size_t max_line = 0;
104     a.seekg(0);
105     a.peek();
106
107     while (!a.eof())
108     {
109         a.ignore(numeric_limits<streamsize>::max(), '\n');
110         max_line++;
111         a.peek();
112     }
113     return max_line;
114 }
115
116
117 size_t longword(vector<string> a)
118 {
119     size_t max_length = 0;
120
121     for (size_t i = 0; i < a.size(); i++)
122     {
123         if (a[i].length() > max_length)
124         {
125             max_length = a[i].length();
126         }
127     }
128     return max_length;
129 }
130
131
132 string randomword(istream& file, size_t maxline, mt19937& randomnum)
133 {
134     size_t line;
135     string word;
136     line = uniform_int_distribution<size_t>(0, maxline - 1)(randomnum);
137     file.seekg(0);
138
139     for (size_t i = 0; i < line; i++)

```

```

140     {
141         getline(file, word);
142     }
143     return word;
144 }

```

dg46622@ares:~/sheep\$ CPP search sheep
search.cpp...
sheep.cpp***

dg46622@ares:~/sheep\$./sheep.out

Welcome To Word Search!!

How many words would you like?
3

Enter File Name To Get Words From:
nowords.txt

ERROR OPENING FILE!! ENTER AGAIN!

Enter File Name To Get Words From:
haha.txt

ERROR OPENING FILE!! ENTER AGAIN!

Enter File Name To Get Words From:
nope.txt

ERROR OPENING FILE!! ENTER AGAIN!

Enter File Name To Get Words From:
words.txt

```

iodine
strawberry
toast

```

	X	1	2	3	4	5	6	7	8	9	10	11	12
Y													
1	s	p	h	o	a	v	g	s	j	e	c	o	
2	n	q	z	t	s	a	o	t	m	y	s	h	
3	z	g	j	x	g	j	l	j	r	g	w	t	
4	k	e	w	v	z	l	u	r	w	w	e	t	

5 x f h b y m e j i r i s
6 k h c s a b n o v b m o
7 g o y u w j x i f p x l
8 m a f a t t y g t b i z
9 x x r z m g q i d f z a
10 a t s g f z z c o v d e
11 s f x p g t h o n f i b
12 x h v n y i o d i n e i

Enter a Word, X-Coordinate, Y-Coordinate, and Direction.
Direction In form N, NW, SW, etc.
EXAMPLE: apple 1 7 N
iodine 6 12 E

iodine
strawberry
toast
X 1 2 3 4 5 6 7 8 9 10 11 12
Y
1 s p h o a v g s j e c o
2 n q z t s a o t m y s h
3 z g j x g j l j r g w t
4 k e w v z l u r w w e t
5 x f h b y m e j i r i s
6 k h c s a b n o v b m o
7 g o y u w j x i f p x l
8 m a f a t t y g t b i z
9 x x r z m g q i d f z a
10 a t s g f z z c o v d e
11 s f x p g t h o n f i b
12 x h v n y I 0 D I N E i

Enter a Word, X-Coordinate, Y-Coordinate, and Direction.
Direction In form N, NW, SW, etc.
EXAMPLE: apple 1 7 N
toast 8 2 W

iodine
strawberry
toast
X 1 2 3 4 5 6 7 8 9 10 11 12
Y
1 s p h o a v g s j e c o
2 n q z T S A 0 T m y s h
3 z g j x g j l j r g w t
4 k e w v z l u r w w e t
5 x f h b y m e j i r i s
6 k h c s a b n o v b m o
7 g o y u w j x i f p x l
8 m a f a t t y g t b i z
9 x x r z m g q i d f z a
10 a t s g f z z c o v d e
11 s f x p g t h o n f i b
12 x h v n y I 0 D I N E i

Enter a Word, X-Coordinate, Y-Coordinate, and Direction.
Direction In form N, NW, SW, etc.
EXAMPLE: apple 1 7 N
strawberry 1 11 NE

iodine
strawberry
toast
X 1 2 3 4 5 6 7 8 9 10 11 12
Y
1 s p h o a v g s j e c o
2 n q z T S A 0 T m Y s h

3 z g j x g j l j R g w t
4 k e w v z l u R w w e t
5 x f h b y m E j i r i s
6 k h c s a B n o v b m o
7 g o y u W j x i f p x l
8 m a f A t t y g t b i z
9 x x R z m g q i d f z a
10 a T s g f z z c o v d e
11 S f x p g t h o n f i b
12 x h v n y I O D I N E i

GAME OVER!!! You Found All the Words!!

dg46622@ares:~/sheep\$./sheep.out

Welcome To Word Search!!

How many words would you like?
1

Enter File Name To Get Words From:
fruit.txt

ERROR OPENING FILE!! ENTER AGAIN!

Enter File Name To Get Words From:
words.txt

spinach
X 1 2 3 4 5 6 7 8 9
Y
1 o x m a i p f s l
2 q j n v r j g f f
3 s p i n a c h i h
4 m c d l u k i o w
5 x x q a g c g k b

6 e k y h x o a f l
7 h a t x s i r y k
8 i s h x p h l b y
9 o c i s n m z n x

Enter a Word, X-Coordinate, Y-Coordinate, and Direction.
Direction In form N, NW, SW, etc.
EXAMPLE: apple 1 7 N
spinach 1 3 E

spinach
X 1 2 3 4 5 6 7 8 9
Y
1 o x m a i p f s l
2 q j n v r j g f f
3 S P I N A C H i h
4 m c d l u k i o w
5 x x q a g c g k b
6 e k y h x o a f l
7 h a t x s i r y k
8 i s h x p h l b y
9 o c i s n m z n x

GAME OVER!!! You Found All the Words!!

dg46622@ares:~/sheep\$./sheep.out

Welcome To Word Search!!

How many words would you like?
3

Enter File Name To Get Words From:
words.txt

blueberry

chlorine
onion
X 1 2 3 4 5 6 7 8 9 10 11
Y
1 s e r w n k c p b a i
2 r u g s p a h h l w x
3 y l z k x a l e u w q
4 h q x j w n o k e w z
5 w l x x v g r l b i h
6 k a p t d g i q e d o
7 e n o q b a n b r i o
8 e g q n s t e d r d q
9 d n l k g z k k y g r
10 o n i o n v d t i s d
11 n y e c a d t b n h k

Enter a Word, X-Coordinate, Y-Coordinate, and Direction.
Direction In form N, NW, SW, etc.
EXAMPLE: apple 1 7 N
blueberry 8 1 S

blueberry
chlorine
onion
X 1 2 3 4 5 6 7 8 9 10 11
Y
1 s e r w n k c p b a i
2 r u g s p a h h l w x
3 y l z k x a l e u w q
4 h q x j w n o k e w z
5 w l x x v g r l b i h
6 k a p t d g i q e d o
7 e n o q b a n b r i o
8 e g q n s t e d r d q

9 d n l k g z k k y g r
10 o n i o n v d t i s d
11 n y e c a d t b n h k

Enter a Word, X-Coordinate, Y-Coordinate, and Direction.
Direction In form N, NW, SW, etc.
EXAMPLE: apple 1 7 N
blueberry 9 1 S

blueberry
chlorine
onion
X 1 2 3 4 5 6 7 8 9 10 11
Y
1 s e r w n k c p B a i
2 r u g s p a h h L w x
3 y l z k x a l e U w q
4 h q x j w n o k E w z
5 w l x x v g r l B i h
6 k a p t d g i q E d o
7 e n o q b a n b R i o
8 e g q n s t e d R d q
9 d n l k g z k k Y g r
10 o n i o n v d t i s d
11 n y e c a d t b n h k

Enter a Word, X-Coordinate, Y-Coordinate, and Direction.
Direction In form N, NW, SW, etc.
EXAMPLE: apple 1 7 N
chlorine 6 1 S

blueberry
chlorine
onion
X 1 2 3 4 5 6 7 8 9 10 11

Y
1 s e r w n k c p B a i
2 r u g s p a h h L w x
3 y l z k x a l e U w q
4 h q x j w n o k E w z
5 w l x x v g r l B i h
6 k a p t d g i q E d o
7 e n o q b a n b R i o
8 e g q n s t e d R d q
9 d n l k g z k k Y g r
10 o n i o n v d t i s d
11 n y e c a d t b n h k

Enter a Word, X-Coordinate, Y-Coordinate, and Direction.
Direction In form N, NW, SW, etc.
EXAMPLE: apple 1 7 N
chlorine 7 1 S

blueberry
chlorine
onion
X 1 2 3 4 5 6 7 8 9 10 11
Y
1 s e r w n k C p B a i
2 r u g s p a H h L w x
3 y l z k x a L e U w q
4 h q x j w n O k E w z
5 w l x x v g R l B i h
6 k a p t d g I q E d o
7 e n o q b a N b R i o
8 e g q n s t E d R d q
9 d n l k g z k k Y g r

10 o n i o n v d t i s d
11 n y e c a d t b n h k

Enter a Word, X-Coordinate, Y-Coordinate, and Direction.
Direction In form N, NW, SW, etc.
EXAMPLE: apple 1 7 N
onion1 1 10 E

blueberry
chlorine
onion
X 1 2 3 4 5 6 7 8 9 10 11
Y
1 s e r w n k C p B a i
2 r u g s p a H h L w x
3 y l z k x a L e U w q
4 h q x j w n O k E w z
5 w l x x v g R l B i h
6 k a p t d g I q E d o
7 e n o q b a N b R i o
8 e g q n s t E d R d q
9 d n l k g z k k Y g r
10 o n i o n v d t i s d
11 n y e c a d t b n h k

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X 1 2 3 4 5 6 7 8 9 10 11
Y
1 s e r w n k C p B a i

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6 k a p t d g I q E d o
7 e n o q b a N b R i o
8 e g q n s t E d R d q
9 d n l k g z k k Y g r
10 O N I O N v d t i s d
11 n y e c a d t b n h k

GAME OVER!!! You Found All the Words!!

dg46622@ares:~/sheep\$ exit
exit

Script done on 2024-07-15 21:10:45-05:00 [COMMAND_EXIT_CODE="0"]