graphs

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Chapter 1

Class Index

1.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

Graph 5

Chapter 2

File Index

2.1 File List

Here is a list of all files with brief descriptions:

/home/brandon/CPTR227/HW14/graphs/src/main.cpp
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Chapter 3

Class Documentation

3.1 Graph Class Reference

Public Member Functions

- Graph (int nV)
- void addEdge (int i, int j)
- void removeEdge (int i, int j)
- bool hasEdge (int i, int j)
- void outEdges (int i, vector< bool > &edges)
- void inEdges (int i, vector< bool > &edges)
- int nVertices ()
- void printgraph ()

3.1.1 Detailed Description

Definition at line 14 of file main.cpp.

3.1.2 Constructor & Destructor Documentation

3.1.2.1 Graph()

```
Graph::Graph (
            int nV )  [inline]
```

Definition at line 19 of file main.cpp.

```
19                  {
20         n = nV;
21         for(int i = 0; i < n; i++) {
22             vector<bool> newRow(n,false);
23             a.push_back(newRow);
24         }
25     }
```

3.1.3 Member Function Documentation

3.1.3.1 addEdge()

```
void Graph::addEdge (
            int i,
            int j )  [inline]
```

Definition at line 27 of file main.cpp.

```
27                                {
28         a[i][j] = true;
29     }
```

3.1.3.2 hasEdge()

```
bool Graph::hasEdge (
            int i,
            int j )  [inline]
```

Definition at line 35 of file main.cpp.

```
35                                {
36         return a[i][j];
37     }
```

3.1.3.3 inEdges()

```
void Graph::inEdges (
            int i,
            vector< bool > & edges )  [inline]
```

Definition at line 44 of file main.cpp.

```
44                                                  {
45         for (int j = 0; j < n; j++)
46             if (a[j][i]) edges.push_back(j);
47     }
```

3.1.3.4 nVertices()

```
int Graph::nVertices ( )  [inline]
```

Definition at line 49 of file main.cpp.

```
49                      {
50         return n;
51     }
```

3.1.3.5 outEdges()

```
void Graph::outEdges (
            int i,
            vector< bool > & edges )  [inline]
```

Definition at line 39 of file main.cpp.

```
39                                                  {
40         for (int j = 0; j < n; j++)
41             if (a[i][j]) edges.push_back(j);
42     }
```

3.1.3.6 printgraph()

```
void Graph::printgraph ( )  [inline]
```

Definition at line 53 of file main.cpp.

```
53                          {
54         cout « "\t";
55         for(int i = 0; i < n; i++) {
56             cout « i « "\t";
57         }
58         cout « endl;
59         for(int i = 0; i < n; i++) {
60             cout « i « "\t";
61             for(int j = 0; j < n; j++)
62                 cout « a[i][j] « "\t";
63             cout « endl;
64         }
65     }
```

3.1.3.7 removeEdge()

```
void Graph::removeEdge (
            int i,
            int j )  [inline]
```

Definition at line 31 of file main.cpp.

```
31                                      {
32         a[i][j] = false;
33     }
```

The documentation for this class was generated from the following file:

- /home/brandon/CPTR227/HW14/graphs/src/main.cpp

Chapter 4

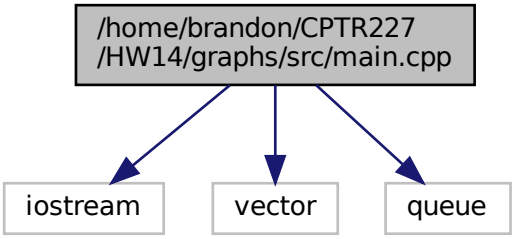
File Documentation

4.1 /home/brandon/CPTR227/HW14/graphs/src/main.cpp File Reference

This is HW14 - Matrix Based Graph for CPTR 227 class.

```
#include <iostream>
#include <vector>
#include <queue>
```

Include dependency graph for main.cpp:



Classes

- class Graph

Functions

- void bfs (Graph &g, int r)
- int main ()

4.1.1 Detailed Description

This is HW14 - Matrix Based Graph for CPTR 227 class.

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Date

4/7/2021

4.1.2 Function Documentation

4.1.2.1 bfs()

```
void bfs (
            Graph & g,
            int r )
```

Definition at line 70 of file main.cpp.

```
70                              {
71     bool *seen = new bool[g.nVertices()];
72     queue <int> q;
73     q.push(r);
74     seen[r] = true;
75     while (q.size() > 0) {
76         int i = q.front();
77         q.pop();
78         vector<bool> edges;
79         g.outEdges(i, edges);
80         for (int k = 0; k < edges.size(); k++) {
81             int j = edges.at(k);
82             if (!seen[j]) {
83                 q.push(j);
84                 seen[j] = true;
85             }
86         }
87     }
88     delete[] seen;
89 }
```

4.1.2.2 main()

```
int main ( )
```

Definition at line 91 of file main.cpp.

```
91            {
92     Graph g(12);
93     g.addEdge(0,1);
94     g.addEdge(1,0);
95     g.addEdge(1,2);
96     g.addEdge(2,1);
97     g.addEdge(2,3);
98     g.addEdge(3,2);
99     g.addEdge(0,4);
100     g.addEdge(4,0);
101     g.addEdge(4,5);
```

```
102     g.addEdge(5,4);
103     g.addEdge(5,6);
104     g.addEdge(6,5);
105     g.addEdge(6,7);
106     g.addEdge(7,6);
107     g.addEdge(3,7);
108     g.addEdge(7,3);
109     g.addEdge(1,5);
110     g.addEdge(5,1);
111     g.addEdge(2,6);
112     g.addEdge(6,2);
113     g.addEdge(4,8);
114     g.addEdge(8,4);
115     g.addEdge(8,9);
116     g.addEdge(9,8);
117     g.addEdge(5,9);
118     g.addEdge(9,5);
119     g.addEdge(9,10);
120     g.addEdge(10,9);
121     g.addEdge(6,10);
122     g.addEdge(10,6);
123     g.addEdge(10,11);
124     g.addEdge(11,10);
125     g.addEdge(7,11);
126     g.addEdge(11,7);
127     g.addEdge(1,6);
128     g.addEdge(5,2);
129     cout « "This is the output of addEdge function" « endl;
130     g.printgraph();
131     g.addEdge(0,5);
132     cout « "Added edge (0,5)" « endl;
133     g.printgraph();
134     g.removeEdge(0,5);
135     cout « "Removed edge(0,5)" « endl;
136     g.printgraph();
137     g.hasEdge(11,6);
138     cout « "This is the output of hasEdge function" « endl;
139     g.printgraph();
140
141 }
```

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