

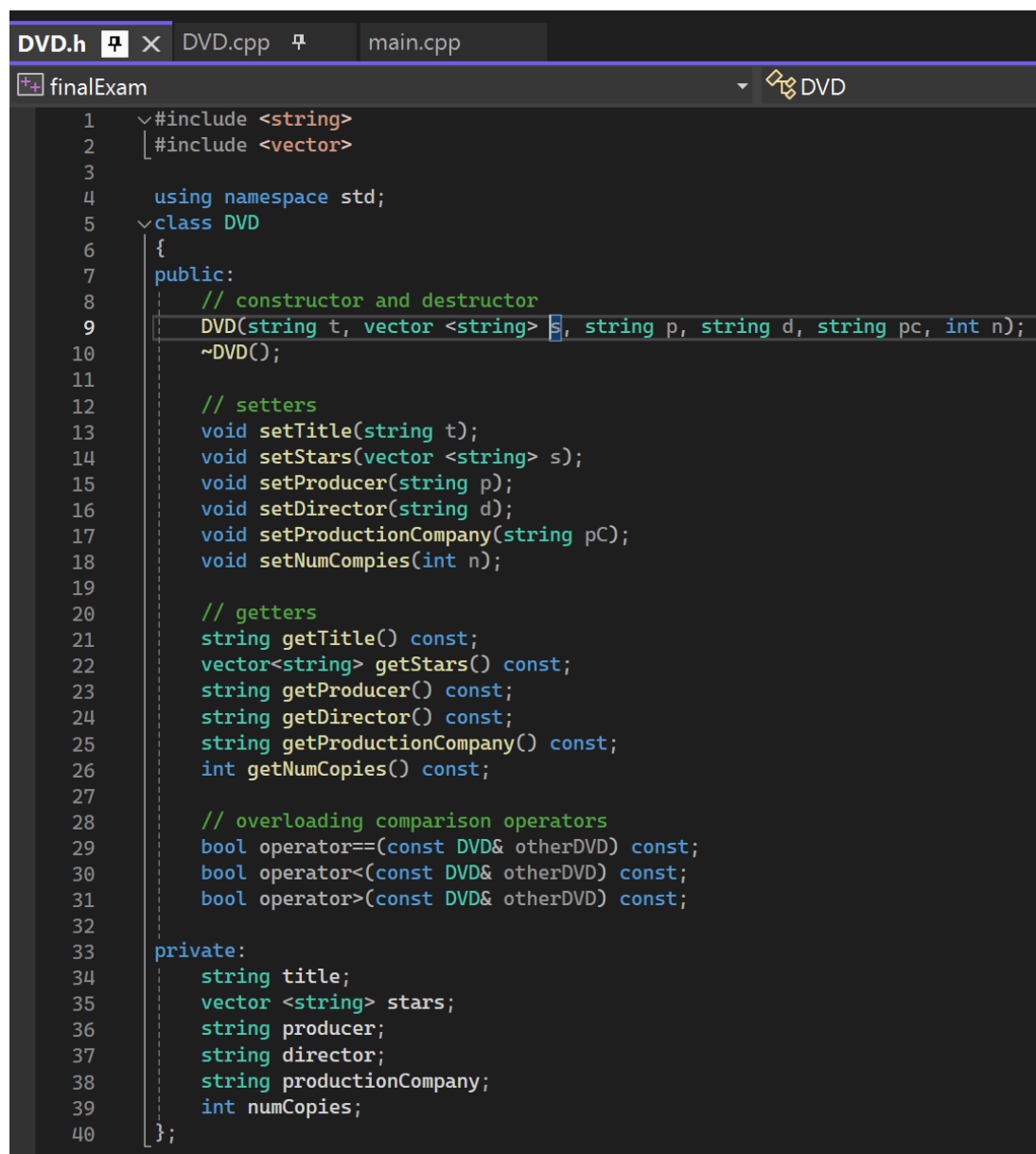
1) Title of the application: [BlueBox](#)

2) Summary explaining the application.

BlueBox is a program for a DVD store which allows the store to keep track of their DVDs. Some of the features supported by the program are creating a list of DVDs owned by the store, showing the details of a particular DVD, and checking whether a particular DVD is in the store. The user is able to enter numbers to choose from menu options such as 1 for adding a new DVD to the list or 2 for removing a DVD from the list.

3) Source code

a. DVD.h



```
1  #include <string>
2  #include <vector>
3
4  using namespace std;
5  class DVD
6  {
7  public:
8      // constructor and destructor
9      DVD(string t, vector<string> s, string p, string d, string pc, int n);
10     ~DVD();
11
12     // setters
13     void setTitle(string t);
14     void setStars(vector<string> s);
15     void setProducer(string p);
16     void setDirector(string d);
17     void setProductionCompany(string pc);
18     void setNumCopies(int n);
19
20     // getters
21     string getTitle() const;
22     vector<string> getStars() const;
23     string getProducer() const;
24     string getDirector() const;
25     string getProductionCompany() const;
26     int getNumCopies() const;
27
28     // overloading comparison operators
29     bool operator==(const DVD& otherDVD) const;
30     bool operator<(const DVD& otherDVD) const;
31     bool operator>(const DVD& otherDVD) const;
32
33 private:
34     string title;
35     vector<string> stars;
36     string producer;
37     string director;
38     string productionCompany;
39     int numCopies;
40 };
```

b. DVD.cpp

```
1  #include "DVD.h"
2  #include <iostream>
3
4  using namespace std;
5
6  // constructor/destructor
7  DVD::DVD(string t, vector<string> s, string p, string d, string pc, int n) {
8      title = t;
9      stars = s;
10     producer = p;
11     director = d;
12     productionCompany = pc;
13     numCopies = n;
14 }
15
16 DVD::~DVD() {}
17
18 // setters
19 void DVD::setTitle(string t) {
20     title = t;
21 }
22 void DVD::setStars(vector<string> s) {
23     stars = s;
24 }
25 void DVD::setProducer(string p) {
26     producer = p;
27 }
28 void DVD::setDirector(string d) {
29     director = d;
30 }
31 void DVD::setProductionCompany(string pc) {
32     productionCompany = pc;
33 }
34 void DVD::setNumCopies(int n) {
35     numCopies = n;
36 }
37
38 // getters
39 string DVD::getTitle() const {
40     return title;
41 }
42 vector<string> DVD::getStars() const {
43     return stars;
44 }
45 string DVD::getProducer() const {
46     return producer;
47 }
48 string DVD::getDirector() const {
49     return director;
50 }
51 string DVD::getProductionCompany() const {
52     return productionCompany;
53 }
54 int DVD::getNumCopies() const {
55     return numCopies;
56 }
57
58 // overloading comparison
59 bool DVD::operator==(const DVD& otherDVD) const {
60     return title == otherDVD.title;
61 }
62 bool DVD::operator<(const DVD& otherDVD) const {
63     return title < otherDVD.title;
64 }
65 bool DVD::operator>(const DVD& otherDVD) const {
66     return title > otherDVD.title;
67 }
```

c. Main.cpp

```
1  #include <iostream>
2  #include "DVD.h"
3
4  // function declarations
5  void addDVD(vector<DVD> &v);
6  void removeDVD(string title, vector<DVD> &v);
7  void findDVD(string title, vector<DVD> &v);
8  void listTitles(vector<DVD> &v);
9  void updateDetails(string title, vector<DVD> &v);
10 void displayDetails(DVD dvd);
11 int search(string title, vector<DVD> &v);
12 void sort(vector<DVD> &v);
13 int getChoice();
14 int getUpdateChoice();
15 vector<string> getStars();
16
17 using namespace std;
18
19 int main() {
20     vector<DVD> v;
21     int choice = 0;
22     string input;
23     while (choice != -1) {
24         choice = getChoice();
25         switch (choice) {
26             case -1:
27                 // quit program
28                 break;
29             case 1:
30                 addDVD(v);
31                 break;
32             case 2:
33                 cout << "Enter the title of the DVD to remove: " << endl;
34                 cin.ignore(256, '\n');
35                 getline(cin, input);
36                 removeDVD(input, v);
37                 break;
38             case 3:
39                 cout << "Enter the title of the DVD to search and display: " << endl;
40                 cin.ignore(256, '\n');
41                 getline(cin, input);
42                 findDVD(input, v);
43                 break;
44             case 4:
45                 listTitles(v);
46                 break;
47             case 5:
48                 cout << "Enter the title of the DVD to update: " << endl;
49                 cin.ignore(256, '\n');
50                 getline(cin, input);
51                 updateDetails(input, v);
52                 break;
53             default:
54                 cout << "Not a valid option.";
55                 break;
56         }
57     }
58     return 0;
59 }
60
```

```

60
61 // returns the user's menu option choice
62 int getChoice() {
63     int choice;
64     cout << "Enter 1 to add a new DVD to the list of DVDS." << endl;
65     cout << "Enter 2 to remove a DVD from the list of DVDs." << endl;
66     cout << "Enter 3 to search for a DVD by title and display its information." << endl;
67     cout << "Enter 4 to list all of the titles of the DVDs in the store in alphabetical order." << endl;
68     cout << "Enter 5 to update the details of a particular of a DVD." << endl;
69     cout << "Enter -1 to quit the program." << endl;
70     cin >> choice;
71     return choice;
72 }
73
74 // prompts the user to enter information about a DVD then adds the DVD to the collection, maintaining a sorted order
75 // DVDs with duplicate titles are not allowed in the collection
76 void addDVD(vector<DVD> &v) {
77     string title;
78     vector<string> stars;
79     string producer;
80     string director;
81     string productionCompany;
82     string input;
83     int numCopies;
84     cout << "Enter the title of the DVD: " << endl;
85     cin.ignore(256, '\n');
86     getline(cin, title);
87     stars = getStars();
88     cout << "Enter the producer: " << endl;
89     getline(cin, producer);
90     cout << "Enter the director: " << endl;
91     getline(cin, director);
92     cout << "Enter the production company: " << endl;
93     getline(cin, productionCompany);
94     cout << "Enter the number of copies: " << endl;
95     cin >> input;
96     numCopies = stoi(input);
97     if (search(title, v) == -1) {
98         DVD dvd(title, stars, producer, director, productionCompany, numCopies);
99         v.push_back(dvd);
100         sort(v);
101     }
102 }
103
104 // removes a DVD with the given title from the given vector
105 void removeDVD(string title, vector<DVD> &v) {
106     vector<DVD>::iterator itr;
107     for (itr = v.begin(); itr != v.end(); ) {
108         if ((*itr).getTitle() == title) {
109             v.erase(itr);
110             break;
111         }
112         else {
113             ++itr;
114         }
115     }
116 }
117

```

```

118 // displays the details a the DVD with the given title
119 void findDVD(string title, vector <DVD> &v) {
120     int result = search(title, v);
121     if (result != -1) {
122         displayDetails(v.at(result));
123     }
124     else {
125         cout << "The DVD you are searching for does not exist." << endl;
126     }
127 }
128
129 // returns the index of the DVD with the given title, or -1 if it is not found
130 int search(string title, vector <DVD> &v) {
131     int index = -1;
132     vector<DVD>::iterator itr;
133     for (int i = 0; i < v.size(); i++) {
134         if (v.at(i).getTitle() == title) {
135             return i;
136         }
137     }
138     return index;
139 }
140
141 // displays the titles of all of the DVDs in the collection in alphabetical order
142 void listTitles(vector <DVD> &v) {
143     vector<DVD>::iterator itr;
144     for (itr = v.begin(); itr != v.end(); ++itr) {
145         cout << (*itr).getTitle() << endl;
146     }
147 }
148
149 // sort vector by title of DVD alphabetically using bubble sort
150 void sort(vector <DVD> &v) {
151     int n = v.size();
152     for (int i = 0; i < n - 1; i++) {
153         for (int j = 0; j < n - i - 1; j++) {
154             if (v[j] > v[j + 1]) {
155                 DVD temp = v[j];
156                 v[j] = v[j + 1];
157                 v[j + 1] = temp;
158             }
159         }
160     }
161 }

```

```

163 // prompts the user to update the field of the given DVD in the given vector
164 void updateDetails(string title, vector <DVD> &v) {
165     int choice = getUpdateChoice();
166     DVD &dvd = v.at(search(title, v));
167     string input;
168     switch (choice) {
169     case 1:
170         cout << "Enter the new title: " << endl;
171         cin.ignore();
172         getline(cin, input);
173         dvd.setTitle(input);
174         break;
175     case 2:
176         cout << "Enter the new stars when prompted: " << endl;
177         dvd.setStars(getStars());
178         break;
179     case 3:
180         cout << "Enter the new producer: " << endl;
181         cin.ignore();
182         getline(cin, input);
183         dvd.setProducer(input);
184         break;
185     case 4:
186         cout << "Enter the new director: " << endl;
187         cin.ignore();
188         getline(cin, input);
189         dvd.setDirector(input);
190         break;
191     case 5:
192         cout << "Enter the new number of copies: " << endl;
193         cin.ignore();
194         getline(cin, input);
195         dvd.setNumCompies(stoi(input));
196         break;
197     default:
198         cout << "Not a valid option. " << endl;
199     }
200 }
201
202 // displays the details of the given DVD
203 void displayDetails(DVD dvd) {
204     cout << "Title: " << dvd.getTitle() << endl;
205     cout << "Stars: ";
206     vector<string>::iterator itr;
207     vector<string> stars = dvd.getStars();
208     for (itr = stars.begin(); itr != stars.end(); ++itr) {
209         cout << *itr << " ";
210     }
211     cout << endl;
212     cout << "Producer: " << dvd.getProducer() << endl;
213     cout << "Director: " << dvd.getDirector() << endl;
214     cout << "Production company: " << dvd.getProductionCompany() << endl;
215     cout << "Number of copies: " << dvd.getNumCopies() << endl;
216 }
217

```

```

217
218 // gets the user's choice for updating the details of a DVD
219 ~int getUpdateChoice() {
220     int choice;
221     cout << "Enter which detail you wish to change: " << endl;
222     cout << "Enter 1 to change the title: " << endl;
223     cout << "Enter 2 to change the stars: " << endl;
224     cout << "Enter 3 to change the producer: " << endl;
225     cout << "Enter 4 to change the director: " << endl;
226     cout << "Enter 5 to change the number of copies: " << endl;
227     cin >> choice;
228     return choice;
229 }
230
231 // helper method to get stars from the user as strings and return them in a vector
232 ~vector<string> getStars() {
233     int numStars;
234     string input;
235     vector<string> stars;
236     cout << "Enter the number of stars: " << endl;
237     cin >> numStars;
238     for (int i = 0; i < numStars; i++) {
239         cout << "Enter a star: " << endl;
240         cin.ignore();
241         getline(cin, input);
242         stars.push_back(input);
243     }
244     return stars;
245 }

```

4) Screenshots of the testing.

a. Add a new DVD to the list of DVDs.

```
C:\Users\kimso\OneDrive\Documents\NEU\24Sp 5008\student-SoojiKim\finalExam\x64\Debug\finalExam.exe
Enter 1 to add a new DVD to the list of DVDs.
Enter 2 to remove a DVD from the list of DVDs.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
1
Enter the title of the DVD:
The Godfather
Enter the number of stars:
2
Enter a star:
Marlon Brando
Enter a star:
Al Pacino
Enter the producer:
Albert Ruddy
Enter the director:
Francis Coppola
Enter the production company:
Paramount
Enter the number of copies:
4
Enter 1 to add a new DVD to the list of DVDs.
Enter 2 to remove a DVD from the list of DVDs.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
```

b. Remove a DVD from the list of DVDs.


```
Enter 1 to add a new DVD to the list of DVDs.
Enter 2 to remove a DVD from the list of DVDs.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
4
Goodfellas
Jaws
The Godfather
Enter 1 to add a new DVD to the list of DVDs.
Enter 2 to remove a DVD from the list of DVDs.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
2
Enter the title of the DVD to remove:
Jaws
Enter 1 to add a new DVD to the list of DVDs.
Enter 2 to remove a DVD from the list of DVDs.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
4
Goodfellas
The Godfather
```

- c. Search for a DVD, given the title of the DVD and display details.

```

C:\Users\kimso\OneDrive\Documents\NEU\24Sp 5008\student-SoojiKim\finalExam\x64\Debug\finalExam.exe
Enter 1 to add a new DVD to the list of DVDs.
Enter 2 to remove a DVD from the list of DVDs.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
1
Enter the title of the DVD:
The Godfather
Enter the number of stars:
2
Enter a star:
Marlon Brando
Enter a star:
Al Pacino
Enter the producer:
Albert Ruddy
Enter the director:
Francis Coppola
Enter the production company:
Paramount
Enter the number of copies:
2
Enter 1 to add a new DVD to the list of DVDs.
Enter 2 to remove a DVD from the list of DVDs.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
3
Enter the title of the DVD to search and display:
The Godfather
Title: The Godfather
Stars: Marlon Brando 1 Pacino
Producer: Albert Ruddy
Director: Francis Coppola
Production company: Paramount
Number of copies: 2

```

- d. List all the titles of the DVDs in the store in an alphabetical sequence of the title

```
C:\Users\kimso\OneDrive\Documents\NEU\24Sp 5008\student-SoojiKim\finalExam\x64\Debug\finalExam.exe
Number of copies: 2
Enter 1 to add a new DVD to the list of DVDs.
Enter 2 to remove a DVD from the list of DVDs.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
1
Enter the title of the DVD:
Goodfellas
Enter the number of stars:
3
Enter a star:
Robert De Niro
Enter a star:
Ray Liotta
Enter a star:
Joe Pesci
Enter the producer:
Irwin Winkler
Enter the director:
Martin Scorsese
Enter the production company:
Warner Bros
Enter the number of copies:
12
Enter 1 to add a new DVD to the list of DVDs.
Enter 2 to remove a DVD from the list of DVDs.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
1
Enter the title of the DVD:
Jaws
Enter the number of stars:
1
Enter a star:
Richard Dreyfuss
Enter the producer:
David Brown
Enter the director:
Steven Spielberg
Enter the production company:
Universal
Enter the number of copies:
6
Enter 1 to add a new DVD to the list of DVDs.
Enter 2 to remove a DVD from the list of DVDs.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
4
Goodfellas
Jaws
The Godfather
```

e. Update details of a particular DVD

i. Title

```
Enter 1 to add a new DVD to the list of DVDs.
Enter 2 to remove a DVD from the list of DVDs.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
3
Enter the title of the DVD to search and display:
test
Title: test
Stars: test
Producer: test
Director: test
Production company: test
Number of copies: 1
Enter 1 to add a new DVD to the list of DVDs.
Enter 2 to remove a DVD from the list of DVDs.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
5
Enter the title of the DVD to update:
test
Enter which detail you wish to change:
Enter 1 to change the title:
Enter 2 to change the stars:
Enter 3 to change the producer:
Enter 4 to change the director:
Enter 5 to change the number of copies:
1
Enter the new title:
Shrek
Enter 1 to add a new DVD to the list of DVDs.
Enter 2 to remove a DVD from the list of DVDs.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
3
Enter the title of the DVD to search and display:
Shrek
Title: Shrek
Stars: test
Producer: test
Director: test
Production company: test
Number of copies: 1
```

ii. Stars

```
Enter the title of the DVD to search and display:
Shrek
Title: Shrek
Stars: test
Producer: test
Director: test
Production company: test
Number of copies: 1
Enter 1 to add a new DVD to the list of DVDs.
Enter 2 to remove a DVD from the list of DVDs.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
5
Enter the title of the DVD to update:
Shrek
Enter which detail you wish to change:
Enter 1 to change the title:
Enter 2 to change the stars:
Enter 3 to change the producer:
Enter 4 to change the director:
Enter 5 to change the number of copies:
2
Enter the new stars when prompted:
Enter the number of stars:
2
Enter a star: Shrek
Enter a star: Donkey
Enter 1 to add a new DVD to the list of DVDs.
Enter 2 to remove a DVD from the list of DVDs.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
3
Enter the title of the DVD to search and display:
Shrek
Title: Shrek
Stars: Shrek Donkey
Producer: test
Director: test
Production company: test
Number of copies: 1
```

iii. Producer

```
Enter the title of the DVD to search and display:
Shrek
Title: Shrek
Stars: Shrek Donkey
Producer: test
Director: test
Production company: test
Number of copies: 1
Enter 1 to add a new DVD to the list of DVDs.
Enter 2 to remove a DVD from the list of DVDs.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
5
Enter the title of the DVD to update:
Shrek
Enter which detail you wish to change:
Enter 1 to change the title:
Enter 2 to change the stars:
Enter 3 to change the producer:
Enter 4 to change the director:
Enter 5 to change the number of copies:
3
Enter the new producer:
Aron Warner
Enter 1 to add a new DVD to the list of DVDs.
Enter 2 to remove a DVD from the list of DVDs.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
3
Enter the title of the DVD to search and display:
Shrek
Title: Shrek
Stars: Shrek Donkey
Producer: Aron Warner
Director: test
Production company: test
Number of copies: 1
```

iv. Director

```
Enter the title of the DVD to search and display:
Shrek
Title: Shrek
Stars: Shrek Donkey
Producer: Aron Warner
Director: test
Production company: test
Number of copies: 1
Enter 1 to add a new DVD to the list of DVDs.
Enter 2 to remove a DVD from the list of DVDs.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
5
Enter the title of the DVD to update:
Shrek
Enter which detail you wish to change:
Enter 1 to change the title:
Enter 2 to change the stars:
Enter 3 to change the producer:
Enter 4 to change the director:
Enter 5 to change the number of copies:
4
Enter the new director:
Andrew Adamson
Enter 1 to add a new DVD to the list of DVDs.
Enter 2 to remove a DVD from the list of DVDs.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
3
Enter the title of the DVD to search and display:
Shrek
Title: Shrek
Stars: Shrek Donkey
Producer: Aron Warner
Director: Andrew Adamson
Production company: test
Number of copies: 1
```

v. Production company

```
Enter the title of the DVD to search and display:
Shrek
Title: Shrek
Stars: Shrek Donkey
Producer: Aron Warner
Director: Andrew Adamson
Production company: test
Number of copies: 1
Enter 1 to add a new DVD to the list of DVDs.
Enter 2 to remove a DVD from the list of DVDs.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
5
Enter the title of the DVD to update:
Shrek
Enter which detail you wish to change:
Enter 1 to change the title:
Enter 2 to change the stars:
Enter 3 to change the producer:
Enter 4 to change the director:
Enter 5 to change the production company:
Enter 6 to change the number of copies:
5
Enter the new production company:
Dreamworks
Enter 1 to add a new DVD to the list of DVDs.
Enter 2 to remove a DVD from the list of DVDs.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
3
Enter the title of the DVD to search and display:
Shrek
Title: Shrek
Stars: Shrek Donkey
Producer: Aron Warner
Director: Andrew Adamson
Production company: Dreamworks
Number of copies: 1
```

vi. Number of Copies


```

Enter the title of the DVD to search and display:
Shrek
Title: Shrek
Stars: Shrek Donkey
Producer: Aron Warner
Director: Andrew Adamson
Production company: Dreamworks
Number of copies: 1
Enter 1 to add a new DVD to the list of DVDS.
Enter 2 to remove a DVD from the list of DVDS.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
5
Enter the title of the DVD to update:
Shrek
Enter which detail you wish to change:
Enter 1 to change the title:
Enter 2 to change the stars:
Enter 3 to change the producer:
Enter 4 to change the director:
Enter 5 to change the production company:
Enter 6 to change the number of copies:
6
Enter the new number of copies:
9999
Enter 1 to add a new DVD to the list of DVDS.
Enter 2 to remove a DVD from the list of DVDS.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
3
Enter the title of the DVD to search and display:
Shrek
Title: Shrek
Stars: Shrek Donkey
Producer: Aron Warner
Director: Andrew Adamson
Production company: Dreamworks
Number of copies: 9999

```

f. Exit

```

Enter 1 to add a new DVD to the list of DVDS.
Enter 2 to remove a DVD from the list of DVDS.
Enter 3 to search for a DVD by title and display its information.
Enter 4 to list all of the titles of the DVDs in the store in alphabetical order.
Enter 5 to update the details of a particular of a DVD.
Enter -1 to quit the program.
-1

C:\Users\kimso\OneDrive\Documents\NEU\24Sp 5008\student-SoojiKim\finalExam\x64\Debug\finalExam.exe
Press any key to close this window . . .

```

5) Explain your choice of the data structure, design and search algorithms.

- I chose to use a vector to store the DVDs because of the built in support for adding, removing, and iterating over the elements in the STL.
- I created a class to represent a DVD in order to cleanly encapsulate all of the information about a DVD.
- Design: I attempted to minimize the amount of code and logic present in the main method and instead implemented most functionality as methods separate from main. I pulled out repeated code fragments and broke down large methods into smaller methods for better readability and good practice (single use methods). I kept only the menu options/switch case in main.
- I chose to implement linear search in this program because of the relatively small number of DVDs used in this trivial example/testing where the runtime would not become unreasonably long. If I were to implement this program in real life for a large collection of DVDs potentially (100,000s) I would use a more efficient searching algorithm such as binary search to reduce the runtime.
- I chose to use bubble sort in this program because it is relatively simple to implement and uses no additional storage. Again, if implementing this for a larger collection of DVDs.

6) State any assumptions made clearly.

- DVDs with duplicate titles are not allowed.
- The vector stores DVDs in sorted order by title, descending alphabetically.
- DVDs are compared only by their title. Titles are case sensitive.

7) Conclusion

Some limitations of my code include lack of error handling for unexpected input. For instance, if a user inputs something that is not able to be casted to an int for the number of stars or the number of copies. If given more time, I would surround these inputs in a try catch block or attempt some other kind of input validation to ensure that casting the input to an int would not cause an exception to occur.

Another limitation that I briefly mentioned above is that my program does not use the most time efficient searching and sorting algorithms available, so for large DVD collections my program would run slowly. I chose to implement the simplest searching and sorting algorithms possible due to the time constraints of the assignment. However, given more time, I would use quick sort and binary search to speed up the program.

Another limitation is that my program does not allow for DVDs with duplicate titles. I made this design decision to make my remove, search, and other such methods more simple because we don't have to check multiple fields to make sure that we are removing or returning the collect DVD; we merely have to check the title.

Currently, every requirement of the project is met by my code and all methods are working as intended, provided that the user gives good and valid input.