LAB 2 – Coding Basics

ELEC 3150 – Object Oriented Programming (Fall 2023)

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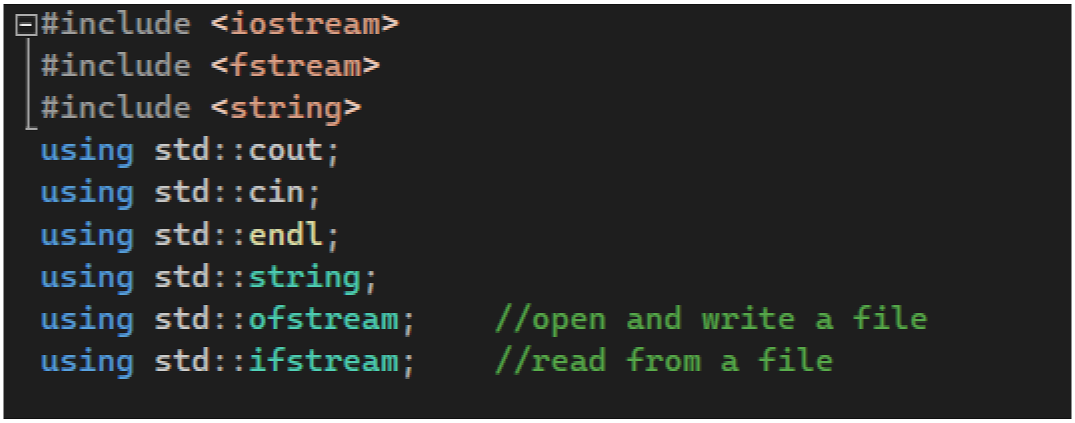
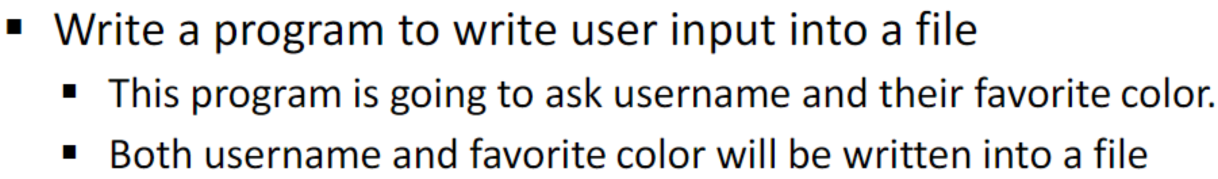
General header include, using:



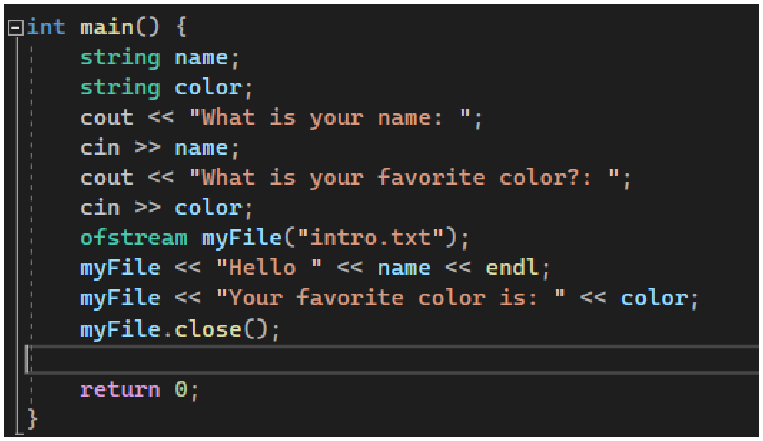
```
#include <iostream>
#include <fstream>
#include <string>
using std::cout;
using std::cin;
using std::endl;
using std::string;
using std::ofstream;    //open and write a file
using std::ifstream;    //read from a file
```

Practice Question 1:



- Write a program to write user input into a file
  - This program is going to ask username and their favorite color.
  - Both username and favorite color will be written into a file

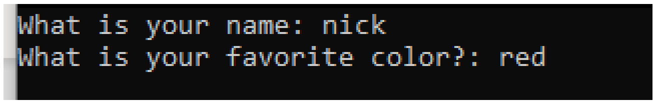
Answer:



```
int main() {
    string name;
    string color;
    cout << "What is your name: ";
    cin >> name;
    cout << "What is your favorite color?: ";
    cin >> color;
    ofstream myFile("intro.txt");
    myFile << "Hello " << name << endl;
    myFile << "Your favorite color is: " << color;
    myFile.close();

    return 0;
}
```

Description: Creates string to store variables name and color. Prompts the user to enter name and color and cin to save it to the variable. Ofstream to write to txt file. Saves to txt file for name and color, myfile.close() closes txt file and saves.

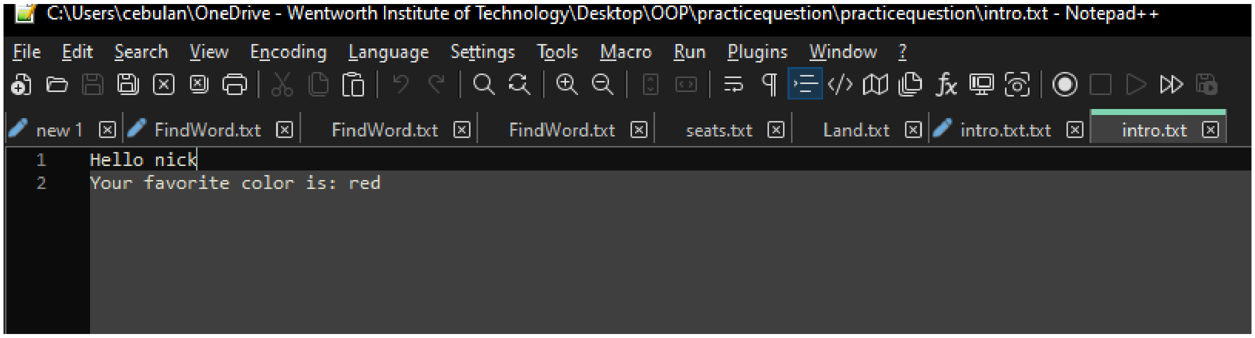
Result after user input:



```
What is your name: nick
What is your favorite color?: red
```

Description: In the command prompt it asks the user to enter their name and favorite color.

Result.txt answer:



C:\Users\cebulan\OneDrive - Wentworth Institute of Technology\Desktop\OOP\practicequestion\practicequestion\intro.txt - Notepad++
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
new 1
FindWord.txt
FindWord.txt
FindWord.txt
seats.txt
Land.txt
intro.txt.txt
intro.txt

```
1   Hello nick
2   Your favorite color is: red
```

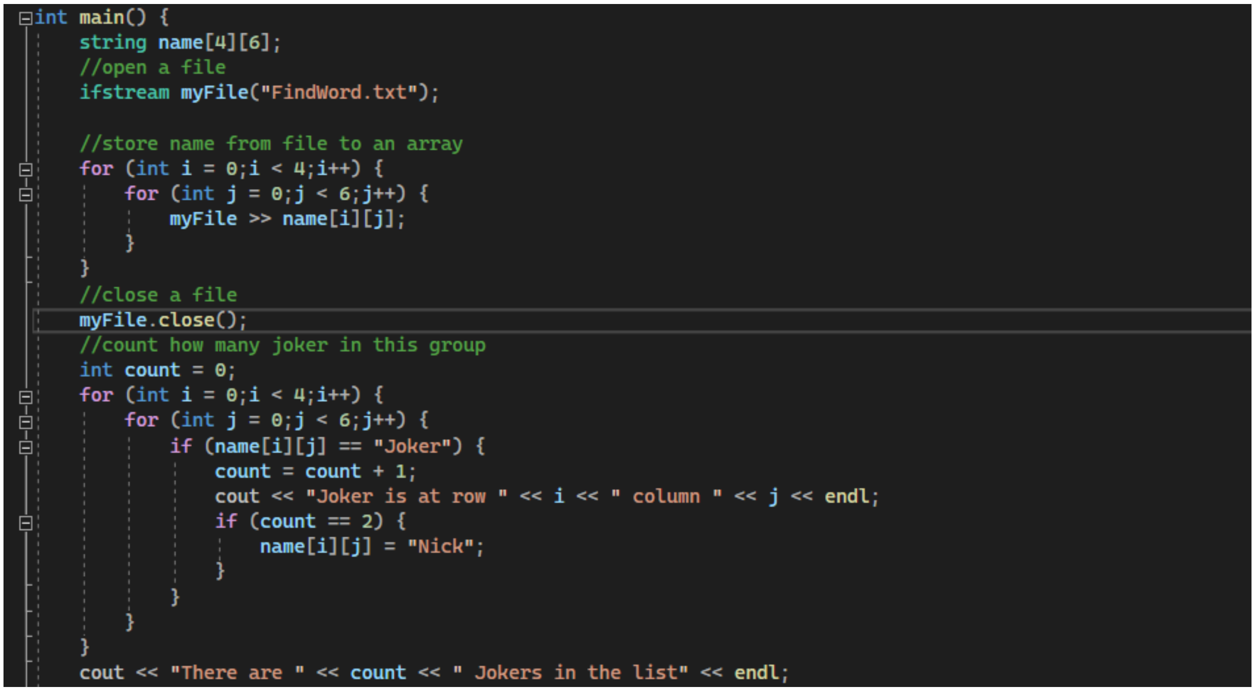
Description: In the result.txt file it prints “hello” (user input name) and on line 2 “your favorite color is: “ (user input favorite color)

Question 3: Joker

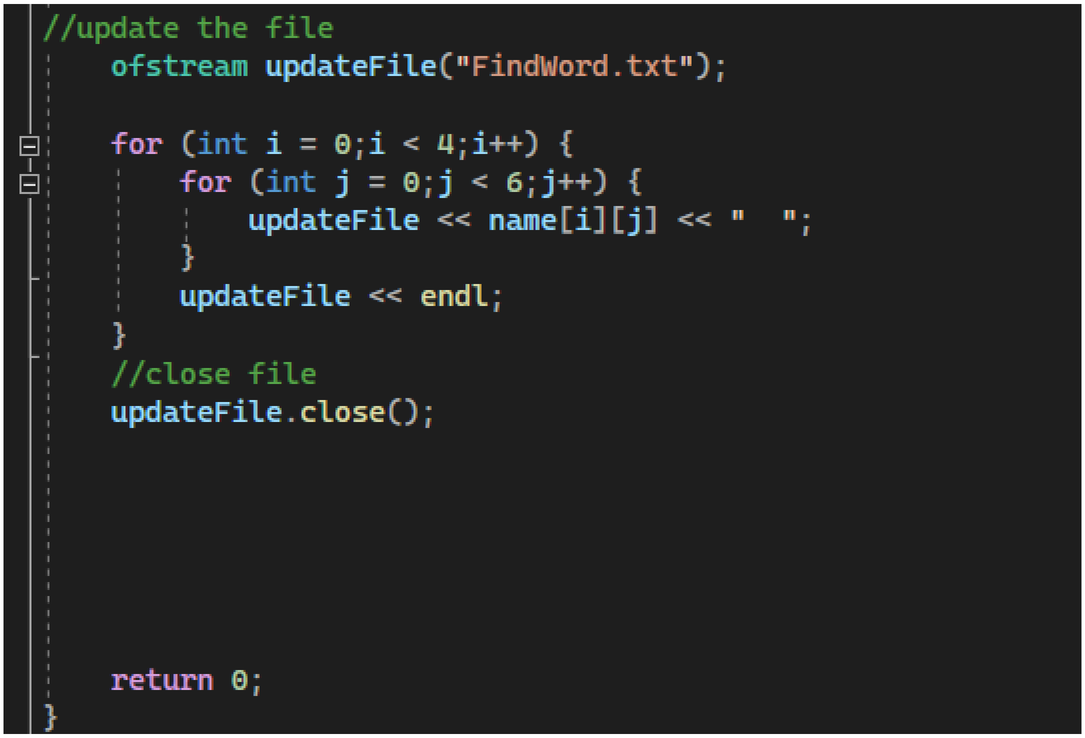
Write a program to find number of Joker in this group

- Name of people in this group are given in file FindWord.txt (This file is available in Brightspace)
- Find location of each Joker
- Change name of 2nd Joker in a file to your name

Answer:



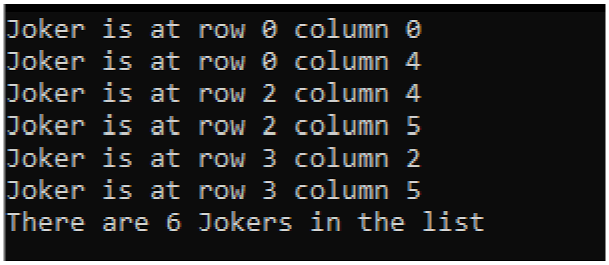
```
int main() {
    string name[4][6];
    //open a file
    ifstream myFile("FindWord.txt");

    //store name from file to an array
    for (int i = 0;i < 4;i++) {
        for (int j = 0;j < 6;j++) {
            myFile >> name[i][j];
        }
    }
    //close a file
    myFile.close();
    //count how many joker in this group
    int count = 0;
    for (int i = 0;i < 4;i++) {
        for (int j = 0;j < 6;j++) {
            if (name[i][j] == "Joker") {
                count = count + 1;
                cout << "Joker is at row " << i << " column " << j << endl;
                if (count == 2) {
                    name[i][j] = "Nick";
                }
            }
        }
    }
    cout << "There are " << count << " Jokers in the list" << endl;
```



```
//update the file
    ofstream updateFile("FindWord.txt");

    for (int i = 0;i < 4;i++) {
        for (int j = 0;j < 6;j++) {
            updateFile << name[i][j] << "  ";
        }
        updateFile << endl;
    }
    //close file
    updateFile.close();





    return 0;
}
```

Description: In this code, ifstream is used to open and read the text file FindWord.txt provided. A 4x6 array of strings is inputted as name[4][6] by using a double for loop int I for column and int j for rows. The file is then closed. Another imbedded for loop is used to read the array to count how many instances of joker appear, and when count==2 it replaces the second joker with my name. It then prints the total number of jokers found by using variable count. Another imbedded for loop is sued to update the findword.txt file to save my name as the second joker by using ofstream to write back to the file. The file is then closed by using updateFile.close() another variable has to be made since there is already myFile instance.

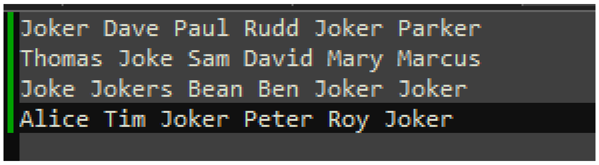
Results:



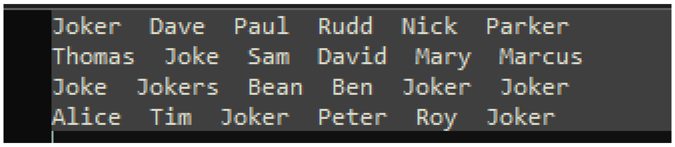
```
Joker is at row 0 column 0
Joker is at row 0 column 4
Joker is at row 2 column 4
Joker is at row 2 column 5
Joker is at row 3 column 2
Joker is at row 3 column 5
There are 6 Jokers in the list
```

Description: In the console it prints the location of each Joker and prints the total number of jokers.

Results Findword.txt:



```
Joker Dave Paul Rudd Joker Parker
Thomas Joke Sam David Mary Marcus
Joke Jokers Bean Ben Joker Joker
Alice Tim Joker Peter Roy Joker
```



```
Joker  Dave  Paul  Rudd  Nick  Parker
Thomas  Joke  Sam  David  Mary  Marcus
Joke  Jokers  Bean  Ben  Joker  Joker
Alice  Tim  Joker  Peter  Roy  Joker
```

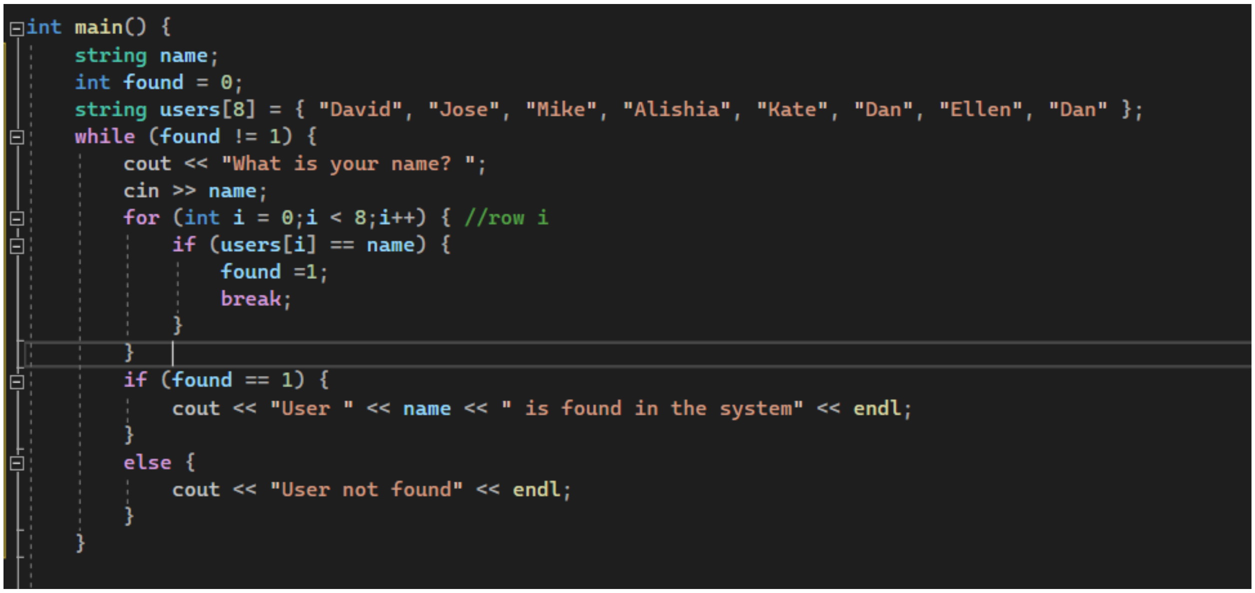
Description: Before you run the code the list of names and Jokers is as shown, after you run the code the second joker in the list is replaced with my name.

Question 1: Name (intermediate)

- Write a program in C++ to ask username and check if the given name is existed in the system.
  - Given Name in a system
    - David, Jose, Mike, Alishia, Kate, Dan, Ellen, Nate

Assumption: Given names-David, Jose, Mike, Alishia, Kate, Dan, Ellen, Nate

Answer:

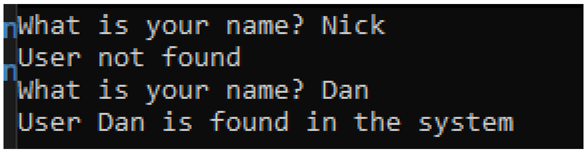


```
int main() {
    string name;
    int found = 0;
    string users[8] = { "David", "Jose", "Mike", "Alishia", "Kate", "Dan", "Ellen", "Dan" };
    while (found != 1) {
        cout << "What is your name? ";
        cin >> name;
        for (int i = 0;i < 8;i++) { //row i
            if (users[i] == name) {
                found =1;
                break;
            }
        }
        if (found == 1) {
            cout << "User " << name << " is found in the system" << endl;
        }
        else {
            cout << "User not found" << endl;
        }
    }
```

In this code, I created variable found to keep track if the user input equals the name of the users in the array of 8 users that have access to the system. The while loop keeps looping as long as the user is not found already, allowing the user to keep trying to enter. It firsts asks the user to enter their name, and saves it as variable name. Then it enters a for loop that checks the array of size 8 if the user is equal to the name, if so, found =1 which prints that the users “name” is found in the system. If not, else statement is used to print user is not found.

BUG FIX: if array is changed, Nate-> Dan, two dan are in matrix, bug will occur if you use found++; so I changed found =1, prints user found instead of user not found because found=2 in that case.

Result:



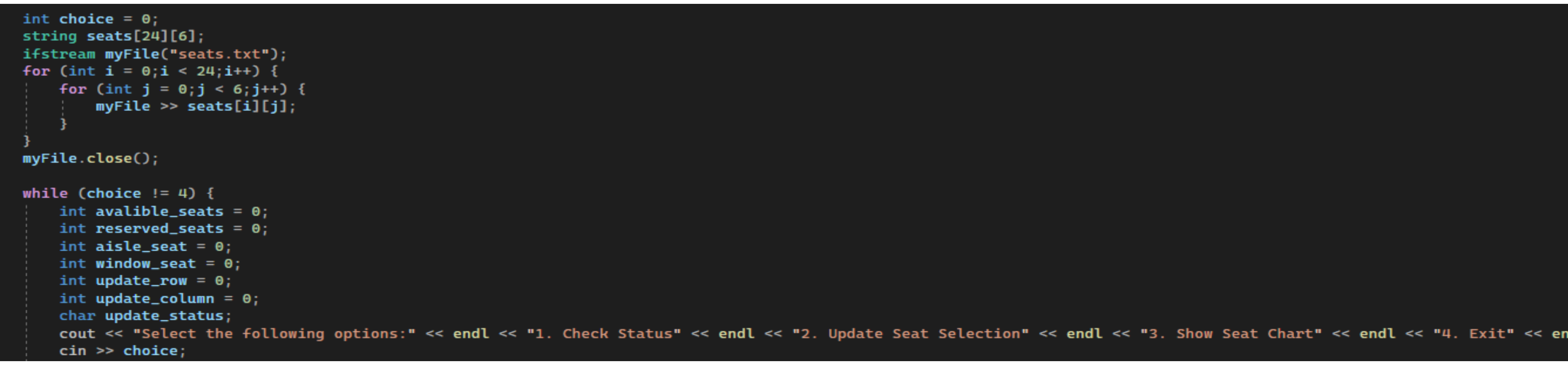
```
What is your name? Nick
User not found
What is your name? Dan
User Dan is found in the system
```

Here is the output, my name is not found, dan is found twice- but still prints it is found in the system.

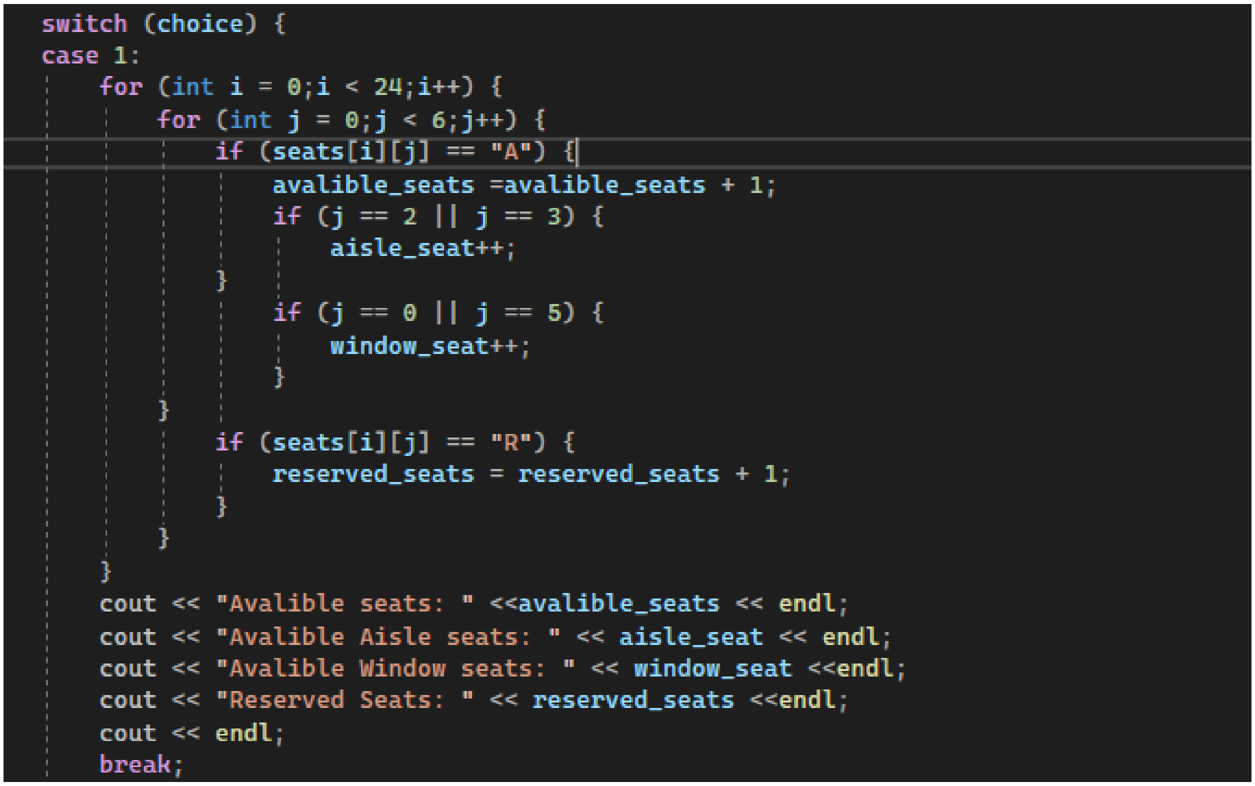
Question 2: Proficiency

Assumption: seats.txt file for read, 24 rows, 6 columns, A=avalible, R=reserved

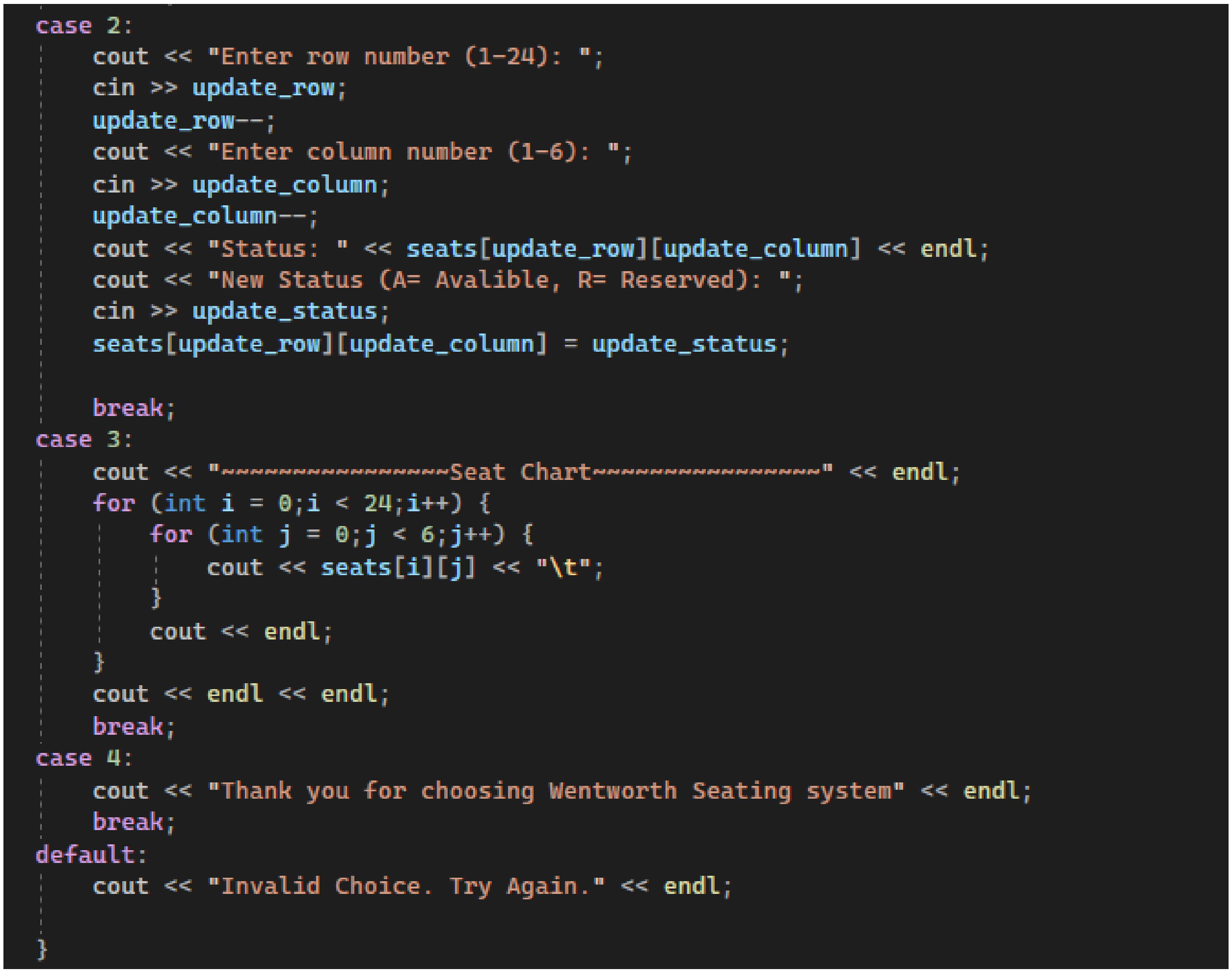
Answer:



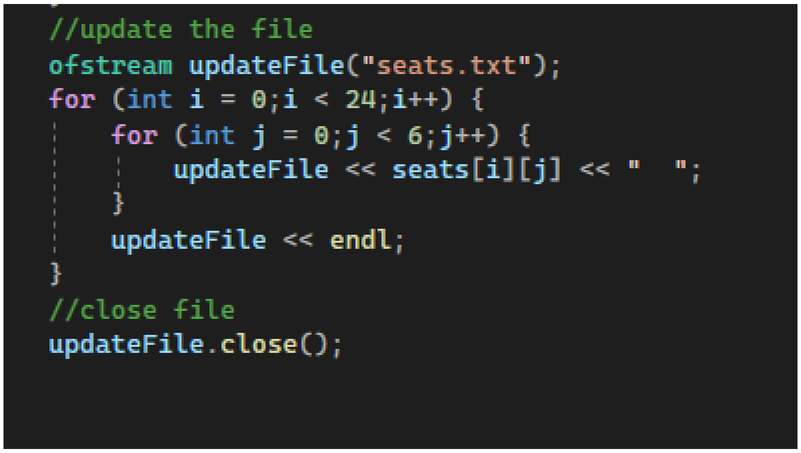
```
int choice = 0;
string seats[24][6];
ifstream myFile("seats.txt");
for (int i = 0;i < 24;i++) {
    for (int j = 0;j < 6;j++) {
        myFile >> seats[i][j];
    }
}
myFile.close();

while (choice != 4) {
    int avalible_seats = 0;
    int reserved_seats = 0;
    int aisle_seat = 0;
    int window_seat = 0;
    int update_row = 0;
    int update_column = 0;
    char update_status;
    cout << "Select the following options:" << endl << "1. Check Status" << endl << "2. Update Seat Selection" << endl << "3. Show Seat Chart" << endl << "4. Exit" << en
    cin >> choice;
```



```
switch (choice) {
case 1:
    for (int i = 0;i < 24;i++) {
        for (int j = 0;j < 6;j++) {
            if (seats[i][j] == "A") {
                avalible_seats =avalible_seats + 1;
                if (j == 2 || j == 3) {
                    aisle_seat++;
            }
                if (j == 0 || j == 5) {
                    window_seat++;
                }
        }
            if (seats[i][j] == "R") {
                reserved_seats = reserved_seats + 1;
            }
        }
    }
    cout << "Avalible seats: " <<avalible_seats << endl;
    cout << "Avalible Aisle seats: " << aisle_seat << endl;
    cout << "Avalible Window seats: " << window_seat <<endl;
    cout << "Reserved Seats: " << reserved_seats <<endl;
    cout << endl;
    break;
```



```
case 2:
    cout << "Enter row number (1-24): ";
    cin >> update_row;
    update_row--;
    cout << "Enter column number (1-6): ";
    cin >> update_column;
    update_column--;
    cout << "Status: " << seats[update_row][update_column] << endl;
    cout << "New Status (A= Avalible, R= Reserved): ";
    cin >> update_status;
    seats[update_row][update_column] = update_status;

    break;
case 3:
    cout << "~~~~~~~~~~~~~~~~Seat Chart~~~~~~~~~~~~~~~~" << endl;
    for (int i = 0;i < 24;i++) {
        for (int j = 0;j < 6;j++) {
            cout << seats[i][j] << "\t";
        }
        cout << endl;
    }
    cout << endl << endl;
    break;
case 4:
    cout << "Thank you for choosing Wentworth Seating system" << endl;
    break;
default:
    cout << "Invalid Choice. Try Again." << endl;

}
```

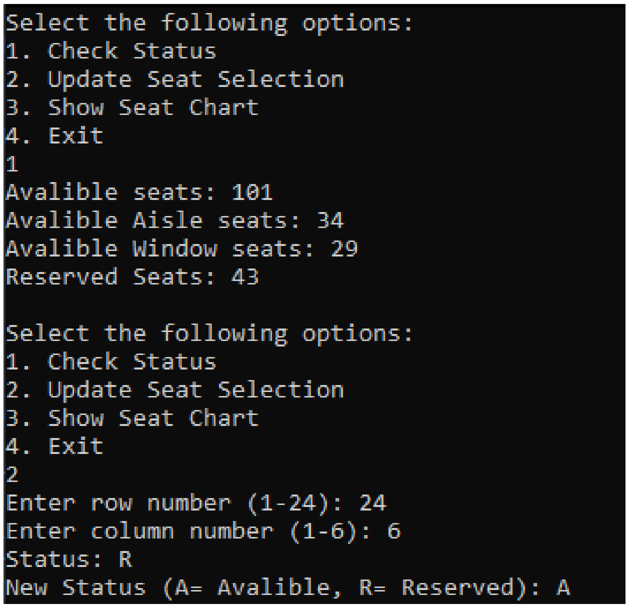


```
//update the file
ofstream updateFile("seats.txt");
for (int i = 0;i < 24;i++) {
    for (int j = 0;j < 6;j++) {
        updateFile << seats[i][j] << "  ";
    }
    updateFile << endl;
}
//close file
updateFile.close();
```

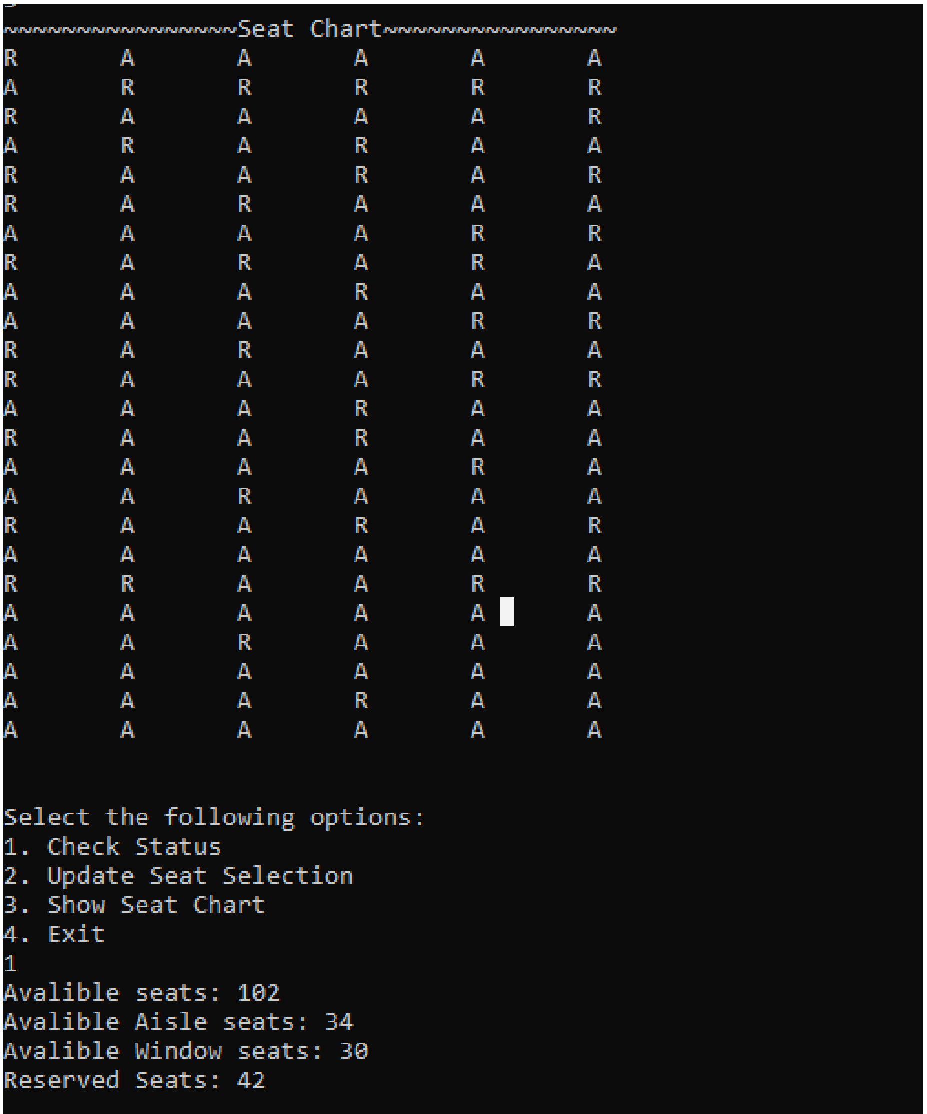
Description: Updates a string array called seats from the text file using an embedded for loop with 24 rows and 6 columns. All variables are set and the code prompts the user to select and option inside the while loop so it keeps asking user after choice is selected unless user selects 4 for exit. I used switch and case for the different selection options. And default for invalid choice selection. For case 1, The program uses an embedded for loop to check for all types of avalible seats and reserved seats and prints to user. For case 2, it prompts the user to update a seat to avalible or reserved based on its status and location.

It stores the new value in the text document. For case 3 it prints the seat chart using another embedded for loop. Case 4, exits and prints thank you message. At the end of the program it updates the file using embedded for loop by using ofstream and closes the file.

Result:



```
Select the following options:
1. Check Status
2. Update Seat Selection
3. Show Seat Chart
4. Exit
1
Avalible seats: 101
Avalible Aisle seats: 34
Avalible Window seats: 29
Reserved Seats: 43

Select the following options:
1. Check Status
2. Update Seat Selection
3. Show Seat Chart
4. Exit
2
Enter row number (1-24): 24
Enter column number (1-6): 6
Status: R
New Status (A= Avalible, R= Reserved): A
```



```
~~~~~~~~~~~~~~~~Seat Chart~~~~~~~~~~~~~~~~
R       A       A       A       A       A
A       R       R       R       R       R
R       A       A       A       A       R
A       R       A       R       A       A
R       A       A       R       A       R
R       A       R       A       A       A
A       A       A       A       R       R
R       A       R       A       R       A
A       A       A       R       A       A
A       A       A       A       R       R
R       A       R       A       A       A
R       A       A       A       R       R
A       A       A       R       A       A
R       A       A       R       A       A
A       A       A       A       R       A
A       A       R       A       A       A
R       A       A       R       A       R
A       A       A       A       A       A
R       R       A       A       R       R
A       A       A       A       A       A
A       A       R       A       A       A
A       A       A       A       A       A
A       A       A       R       A       A
A       A       A       A       A       A


Select the following options:
1. Check Status
2. Update Seat Selection
3. Show Seat Chart
4. Exit
1
Avalible seats: 102
Avalible Aisle seats: 34
Avalible Window seats: 30
Reserved Seats: 42
```

Description: In the console it asks the user to select an option in a while loop so it keeps asking after the selection unless 4 is selected to exit. When 1 is selected prints all types of avalible seats, and reserved seats, when 2 is selected it updates a seat that you select and tells you its status. For choice 3 it prints the seat chart.

Self-Assessment: In this lab I learned how to use embedded for loops to print and save an array and update selected row/column location. I learned how to use an external text file to read and write to it. I also learned how to use 2d arrays and familiarize myself with strings.