Chapter 6 Smith Exercises & Labs

Exercise 6-1.

1. a. double gradeAverages[6];
   b. string lastNames[7];
   c. int ages[10];
2. a. int wholeNumbers[] = {2, 4, 6, 8, 10};
   b. string lastNames[] = {“Carlson”, “Matthews”, “Cooper”};
   c. double prices[] = {15.00, 122.00, 7.50};
3. int customerNumber[];
   customerNumber[0] = 32;
4. numbers[1] is at memory location 4004
   numbers[4] is at memory location 4016

Lab 6-1.

6-1.cpp

```
#include <iostream>
#include <string>
using namespace std;

int main(){
    const int SIZE = 8;
    double averages[SIZE];
    int loopIndex;
    double battingAverage;
    double min, max;
    double total, average;

    for(loopIndex = 0; loopIndex < SIZE; ++loopIndex){
        cout << "Enter a batting average: ";
        cin >> battingAverage;
        averages[loopIndex] = battingAverage;
    }

    min = averages[0];
    max = averages[0];
    total = averages[0];
    for(loopIndex = 1; loopIndex < SIZE; ++loopIndex){
        if(min > averages[loopIndex]){
            min = averages[loopIndex];
        }
        if(max < averages[loopIndex]){
            max = averages[loopIndex];
        }
        total = total + averages[loopIndex];
    }

    average = total / SIZE;
    cout << endl;
    cout << "Batting averages given: ";
    for(loopIndex = 0; loopIndex < SIZE; ++loopIndex){
        if(loopIndex != 7){
            cout << averages[loopIndex] << ", ";
        }
        else{
            cout << averages[loopIndex];
        }
    }
    cout << endl << endl;
    cout << "Maximum batting average: " << max << endl;
    cout << "Minimum batting average: " << min << endl;
    cout << "Average batting average: " << average << endl;

    cout << endl << "Code by Jacob Smetana" << endl;
    return 0;
}
```

```
"C:\Users\Nii-san\Desktop\prog fund 1\Chapter 6\Smith Exercises & Labs\Lab 6-1.exe"
Enter a batting average: .299
Enter a batting average: .157
Enter a batting average: .242
Enter a batting average: .203
Enter a batting average: .198
Enter a batting average: .333
Enter a batting average: .270
Enter a batting average: .190

Batting averages given: 0.299, 0.157, 0.242, 0.203, 0.198, 0.333, 0.27, 0.19

Maximum batting average: 0.333
Minimum batting average: 0.157
Average batting average: 0.2365

Code by Jacob Smetana

Process returned 0 (0x0)   execution time : 16.749 s
Press any key to continue.
```

Exercise 6-2.

1. Is the for loop written correctly?
   No. Replace **<=** with just **<.**

2. Which variable is the flag?
   The variable **foundIt**.

3. Is the flag variable declared correctly?
   It works but should be declared as a boolean instead.

4. Is the comparison in the if statement done correctly?
   Yes.

Lab 6-2.

6-2.cpp

```
#include <iostream>
#include <string>
using namespace std;
int main(){
    const int NUM_CITIES = 10;
    string inCity;          // name of city to look up in array
    string citiesInMichigan[] = {"Acme", "Albion", "Detroit", "Watervliet", "Coloma",
                                 "Saginaw", "Richland", "Glenn", "Midland", "Brooklyn"};
    string validCity = "That IS a city in Michigan!";
    string invalidCity = "Not a city in Michigan.";
    const string END = "ZZZ";
    bool foundIt = false;   // Flag variable
    int x;                  // Loop control variable

    while(x){
        cout << "Enter name of city or ZZZ to end: ";
        cin >> inCity;
        cout << endl;
        if(inCity == END){
            break;
        }
        for(x = 0; x < NUM_CITIES; ++x){
            if(inCity == citiesInMichigan[x]){
                foundIt = true;
            }
        }
        if(foundIt == false){
            cout << invalidCity << endl << endl << endl;
        }
        else{
            cout << validCity << endl << endl << endl;
        }
        foundIt = false;
    }

    cout << endl << "Code by Jacob Smetana" << endl;
    return 0;
}
```

```
"C:\Users\Nii-san\Desktop\prog fund 1\Chapter 6\Smith Exercises & Labs\Lab 6
Enter name of city or ZZZ to end: Chicago

Not a city in Michigan.


Enter name of city or ZZZ to end: Brooklyn

That IS a city in Michigan!


Enter name of city or ZZZ to end: Watervliet

That IS a city in Michigan!


Enter name of city or ZZZ to end: Acme

That IS a city in Michigan!


Enter name of city or ZZZ to end: ZZZ


Code by Jacob Smetana

Process returned 0 (0x0)   execution time : 17.263 s
Press any key to continue.
```

Exercise 6-3.

1. Are the arrays declared and initialized correctly?
   No. They need curly braces.

2. Is the for loop written correctly?
   No. **i = MAX_CITIES** should be **i < MAX_CITIES**

3. As written, how many times will the for loop execute?
   Never, because **i** will never equal **MAX_CITIES**

4. How would you describe the purpose of the statement **foundIt = i;**?
   Its purpose is to be compared to the appropriate elements in both arrays.

Lab 6-3.

6-3.cpp

```
// xxxxxxxJava.xxx - This program looks up and prints the names and prices of cof
#include <iostream>
#include <string>
using namespace std;
int main(){
    string addIn;               // Add-in ordered
    const int NUM_ITEMS = 5;
    string addIns[] = {"Cream", "Cinnamon", "Chocolate", "Amaretto", "Whiskey"};
    double addInPrices[] = {.89, .25, .59, 1.50, 1.75};
    bool foundIt = false;       // Flag variable
    int x;                      // Loop control variable
    double orderTotal = 2.00;   // All orders start with a 2.00 charge
    string sorryBro = "Sorry, we do not carry that.";
    string END = "XXX";

    while(x){
        cout << "Enter coffee add-in or " << END << " to quit: ";
        cin >> addIn;
        if(addIn == END){
            break;
        }
        for(x = 0; x < NUM_ITEMS && foundIt == false; ++x){
            if(addIn == addIns[x]){
                foundIt = true;
            }
        }
        if(foundIt == true){
            --x;
            cout << addIns[x] << ": $" << addInPrices[x] << endl;
        }
        else{
            cout << sorryBro << endl;
        }
        orderTotal = orderTotal + addInPrices[x];
        cout << endl << "Total cost of order: $" << orderTotal << endl << endl << endl;

        ++x;
        foundIt = false;
        orderTotal = 2.00;
    }

    cout << endl;
    cout << "Code by Jacob Smetana" << endl;
    return 0;
}
```

```
Enter coffee add-in or XXX to quit: Cream
Cream: $0.89

Total cost of order: $2.89


Enter coffee add-in or XXX to quit: Caramel
Sorry, we do not carry that.

Total cost of order: $2


Enter coffee add-in or XXX to quit: Whiskey
Whiskey: $1.75

Total cost of order: $3.75


Enter coffee add-in or XXX to quit: chocolate
Sorry, we do not carry that.

Total cost of order: $2


Enter coffee add-in or XXX to quit: Chocolate
Chocolate: $0.59

Total cost of order: $2.59


Enter coffee add-in or XXX to quit: Cinnamon
Cinnamon: $0.25

Total cost of order: $2.25


Enter coffee add-in or XXX to quit: Vanilla
Sorry, we do not carry that.

Total cost of order: $2


Enter coffee add-in or XXX to quit: XXX

Code by Jacob Smetana

Process returned 0 (0x0)   execution time : 26.245 s
Press any key to continue.
```