**Names:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. An array is a(n) \_\_\_Data Structure\_\_\_\_\_\_ (not object) that stores multiple values all of the same \_\_\_data\_\_\_\_\_ \_\_\_\_type\_\_\_\_\_\_\_(2 words). Each location in the array that stores a value is called a(n) \_\_\_\_element\_\_\_\_ (hint: starts with e) and the individual values are accessed using a(n) \_\_\_\_\_index\_\_\_\_\_\_\_ (also called a(n) \_\_\_\_\_subscript\_\_\_\_\_\_\_\_) which are numbered starting at 0. (12 points: 2 points for each blank)
2. Write a statement that defines **A** to be an array of size 100 which will store **ints**. (4 points)

int A[100];

1. When the size of an array is specified as a constant value at compile-time, as for **A**, the array is said to be \_statically\_\_-allocated. (2 points)
2. Write a **for** loop that initializes each of the elements of **A** to **-1**. (10 points)

for (int i = 0; i < 100; i++) {

A[i] = -1;

}

1. A text file named **ints.txt** contains between 1 and 100 integers, inclusive, one per line. Write C++ code that reads the contents of **ints.txt** into **A** using an **eof** loop. (10 points)

#include <iostream>

#include <fstream>

using namespace std;

int main() {

const int MAX\_SIZE = 100;

int A[MAX\_SIZE];

int count = 0;

ifstream inputFile("ints.txt");

while (inputFile >> A[count] && count < MAX\_SIZE) {

count++;

}

inputFile.close();

cout << "Contents of the array:" << endl;

for (int i = 0; i < count; i++) {

cout << A[i] << " ";

}

cout << endl;

return 0;

}

1. Write code which writes the elements of **A** that contain valid data to an output file named **ints-reverse.txt**, in reverse order. That is, the contents of **ints-reverse.txt** will be the same as ints.txt but the integers will be in reverse order. (10 points: 2 points each line)

#include <iostream>

#include <fstream>

using namespace std;

int main() {

const int MAX\_SIZE = 100;

int A[MAX\_SIZE];

int count = 0;

ifstream inputFile("ints.txt");

while (inputFile >> A[count] && count < MAX\_SIZE) {

count++;

}

inputFile.close();

ofstream outputFile("ints-reverse.txt");

for (int i = count - 1; i >= 0; i--) {

outputFile << A[i] << endl;

}

outputFile.close();

cout << "Reversed contents written to ints-reverse.txt" << endl;

return 0;

}

1. In Exercise 4, you initialized **A** using a **for** loop. For this exercise, write a statement that defines an array of doubles named **B** of size 5 and initialize each element to 0 using an array initialization list. (4 points)

double B[5] = {0, 0, 0, 0, 0};

1. Repeat Exercise 7, but this time initialize the element at index **i** to **i + 1**. **(4 points)**

double B[5] = {1, 2, 3, 4, 5};

1. Answer the following as true or false. If false, provide reason. **(2 points)**

**The following statement updates the content of the fifth component of the array list.**

**list [5] = list[3] + list[2];**

**False indexing is zero based. List[5] means the sixth element.**

1. Consider the following declaration: (**8 points**)

Arrays and Strings: Exercises

In this declaration, identify the following:

|  |  |
| --- | --- |
| 1. The array name. | Passwords |
| 1. The array size. | 100 |
| 1. The data type of each array component. | Double |
| 1. The range of values for the index of the array. | 0-99 |

1. Identify error(s), if any, in the following array declarations. If a statement is incorrect, provide the correct statement. **(14 points)**

|  |  |  |
| --- | --- | --- |
|  | Arrays and Strings: Exercises | true |
|  | Arrays and Strings: Exercises | Int age[81]; |
|  | Arrays and Strings: Exercises | true |
|  | Arrays and Strings: Exercises | Int list[100]; |
|  | Arrays and Strings: Exercises | Double salaries[50]; |
|  | Arrays and Strings: Exercises | const double LEGNTH = 30.00;  double list[static\_cast<int>(LENGTH)] |
|  | Arrays and Strings: Exercises | true |

1. Consider the following declaration: (10 points)

int beta[3][3];

What is stored in beta after each of the following statements executes? Show your work.

1. for (i = 0; i < 3; i++)

for (j = 0; j < 3; j++)

beta[i][j] = 0;

1. for (i = 0; i < 3; i++)

for (j = 0; j < 3; j++)

beta[i][j] = i + j;

1. The following program contains several mistakes (not syntax errors) that will cause bugs. Identify and explain each mistake. Assume the necessary header files are included and the using namespace std line is present. (10 points)

// This program displays the average of quiz scores. You may assume that each quiz score

// will be entered as an integer in the range [0, 10].

int main()

{

int count = 0, score, sum;

cout << "Enter quiz score (negative value to quit)? ";

cin >> score;

while (score > 0) {

sum += score;

++count;

cout << "Enter quiz score (negative value to quit)? ";

cin >> score;

}

if (count = 0) {

cout << "No average could be calculated." << endl;

} else {

double avg = static\_cast<double>(sum) / count;

cout << fixed << setprecision(1);

cout << "The average is " << avg << endl;

}

return 0;

}