**CSC 1101 – Problem Solving and Programming Laboratory**

**Lab 2 – Omar Faruk**

**25 points – Due September 14, 11pm**

**a)** Save this document with your name and the homework number somewhere in the file name.

**b)** Paste your code and screenshots into the document.

**c)** Submit this document and your .cpp file(s) to the Canvas item where you downloaded this document. Do not submit a zip file but individually attach your files.

You will write two programs in this lab. You may use one Visual Studio / Xcode project and switch among your C++ .cpp files, or create one Visual Studio / Xcode project for each program.

**1) [12 points]** You've been hired by *Lyrical Loons* to fix a C++ console application that displays lyrics from the song *Just Around the Riverbend* from Pocahontas. Start with file **Lab02-01.cpp**. Add whitespace to the code so that it's readable. Add a header comment and add 3-4 body comments in the application code.

**2) [13 points]** You've been hired by *Hex Haven* to write a C++ console application that converts a hexadecimal number to a binary number. Start with file **Lab02-02. cpp** and make the following edits:

1) Complete the header comment.

2) Declare one string variable, hexStr, with a comment.

3) Add an application header using a comment and cout statements.

4) Add an application close using a comment and a cout statement.

Note that the application uses a for statement and an if statement. We will cover these later in the semester.

Run the program five times with different values for the hexadecimal number. What are the results?

|  |  |  |
| --- | --- | --- |
| Run | Hexadecimal number | Binary number |
| **1** | 1 | 0001 |
| **2** | 2A | 0010 1010 |
| **3** | 9F | 1001 1111 |
| **4** | 255 | 0010 0101 0101 |
| **5** | 192C | 0001 1001 0010 1100 |

*[your program code here]\**

// =========================================================

//

// Title: <Lab 02-01>

// Course: CSC 1101

// Lab Number: <Lab 02-01>

// Author: <Omar Faruk>

// Date: <09/12/2020>

// Description:

// In this lab, we are adding the header, white space to make code readable,

// and adding the body comments to the code.

//

//==========================================================

#include <cstdlib> // For several general-purpose functions

#include <fstream> // For file handling

#include <iomanip> // For formatted output

#include <iostream> // For cin, cout, and system

#include <string> // For string data type

using namespace std; // So "std::cout" may be abbreviated to "cout"

int main()

{

//Song title

cout << "Welcome to Lyrical Loons" << endl;

cout << "----------------------------" << endl << endl;

//First Lyrics

cout << "I look once more," << endl;

cout << "Just around the riverbend," << endl;

cout << "Beyond the shore," << endl;

cout << "Somewhere past the sea." << endl << endl;

//Second Lyrics

cout << "Don't know what for ...," << endl;

cout << "Why do all my dreams extend," << endl;

cout << "Just around the riverbend?" << endl;

cout << "Just around the riverbend ..." << endl << endl;

//End of lyrics

cout << "End of Lyrical Loons" << endl;

return 0;

}

// =========================================================

//

// Title: <Lab 02-02>

// Course: CSC 1101

// Lab Number: <Lab 02-02>

// Author: <Omar Faruk>

// Date: <09/12/2020>

// Description:

// In this lab, we are adding the header, string hexStr in camel format,

// and adding both application header and close.

//

//==========================================================

#include <cstdlib> // For several general-purpose functions

#include <fstream> // For file handling

#include <iomanip> // For formatted output

#include <iostream> // For cin, cout, and system

#include <string> // For string data type

using namespace std; // So "std::cout" may be abbreviated to "cout"

int main()

{

// Declare variable

string hexStr;

//Show Application Header

cout << "Welcome to the Hexadecimal to Binary number converter!" << endl;

cout << "-------------------------------------------------------"

<< "----------" << endl << endl;

// Prompt for and get hexadecimal number

cout << "Enter a hexadecimal number "

<< "(only characters 0-9, A-F): ";

cin >> hexStr;

// Loop to convert hexadecimal to binary

cout << "Hexadecimal " << hexStr << " is binary ";

for (int i = 0; i < hexStr.length(); i++)

if (toupper(hexStr[i]) == '0')

cout << "0000 ";

else if (toupper(hexStr[i]) == '1')

cout << "0001 ";

else if (toupper(hexStr[i]) == '2')

cout << "0010 ";

else if (toupper(hexStr[i]) == '3')

cout << "0011 ";

else if (toupper(hexStr[i]) == '4')

cout << "0100 ";

else if (toupper(hexStr[i]) == '5')

cout << "0101 ";

else if (toupper(hexStr[i]) == '6')

cout << "0110 ";

else if (toupper(hexStr[i]) == '7')

cout << "0111 ";

else if (toupper(hexStr[i]) == '8')

cout << "1000 ";

else if (toupper(hexStr[i]) == '9')

cout << "1001 ";

else if (toupper(hexStr[i]) == 'A')

cout << "1010 ";

else if (toupper(hexStr[i]) == 'B')

cout << "1011 ";

else if (toupper(hexStr[i]) == 'C')

cout << "1100 ";

else if (toupper(hexStr[i]) == 'D')

cout << "1101 ";

else if (toupper(hexStr[i]) == 'E')

cout << "1110 ";

else if (toupper(hexStr[i]) == 'F')

cout << "1111 ";

else // Handle invalid hex digit

cout << "???? ";

//Add new line for application close

cout << endl;

//Show application close

cout << "\nEnd of Hexadecimal to Binary number converter!" << endl;

}

*[your five program outputs here]\*\**











