**OMAR FARUK GW2625 01/12/2021**

**CSC 1501 – Assignment 2**

**Logical Statements**

**(Due: 9/16/20)**

**Code:**

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

//

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// Course: CSC 1501

// Lab Number: Lab 2

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// Date: 01/12/2021

// Description:

// Creating an application to provide solutions for five logical

// statements for 8 possible combinations of A,B,& C by using logical

// operators, branching, arrays, and loops.

//

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

#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 constants

const int ARRAY\_SIZE = 8;

// Declare Arrays

int arrayA[ARRAY\_SIZE] = {0, 0, 0, 0, 1, 1, 1, 1};

int arrayB[ARRAY\_SIZE] = {0, 0, 1, 1, 0, 0, 1, 1};

int arrayC[ARRAY\_SIZE] = {0, 1, 0, 1, 0, 1, 0, 1};

// Show application header

cout << "Welcome to Logical Statements!" << endl;

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

cout << "Below are solutions to five logical statements: " << endl << endl;

// Print first logical staement

cout << "[1] (A and B) or (A and C)" << endl;

// Loop to iterate over arrays

for (int i = 0; i < 8; i++)

{

// statement if true,1 or false,0

if ((arrayA[i] && arrayB[i] == true) || (arrayA[i] && arrayC[i] == true))

{

cout << "(A and B) or (A and C) is true when A = " << arrayA[i] << ", B =" << arrayB[i] << ", and C =" << arrayC[i] << endl;

}

else

{

cout << "(A and B) or (A and C) is false when A = " << arrayA[i] << ", B =" << arrayB[i] << ", and C =" << arrayC[i] << endl;

}

}

// Print second logical statement

cout << endl << "[2] (A and C) and (B and !C)" << endl;

// Loop to iterate over arrays

for (int i = 0; i < 8; i++)

{

// statement if true,1 or false,0

if ((arrayA[i] && arrayC[i] == true) && (arrayB[i] && !arrayC[i] == true))

{

cout << "(A and C) and (B and !C) is true when A = " << arrayA[i] << ", B =" << arrayB[i] << ", and C =" << arrayC[i] << endl;

}

else

{

cout << "(A and C) and (B and !C) is false when A = " << arrayA[i] << ", B =" << arrayB[i] << ", and C =" << arrayC[i] << endl;

}

}

// Print third logical statement

cout << endl << "[3] (A or B) and !(B or C)" << endl;

// Loop to iterate over arrays

for (int i = 0; i < 8; i++)

{

// statement if true,1 or false,0

if ((arrayA[i] || arrayB[i] == true) && !(arrayB[i] || arrayC[i] == true))

{

cout << "(A or B) and !(B or C) is true when A = " << arrayA[i] << ", B =" << arrayB[i] << ", and C =" << arrayC[i] << endl;

}

else

{

cout << "(A or B) and !(B or C) is false when A = " << arrayA[i] << ", B =" << arrayB[i] << ", and C =" << arrayC[i] << endl;

}

}

// Print fourth logical statement

cout << endl << "[4] (A or (B and C)) and (!A and !B)" << endl;

// Loop to iterate over arrays

for (int i = 0; i < 8; i++)

{

// statement if true,1 or false,0

if (((arrayA[i] || (arrayB[i] && arrayC[i]))== true) && (!arrayA[i] && !arrayB[i] == true))

{

cout << "(A or (B and C)) and (!A and !B) is true when A = " << arrayA[i] << ", B =" << arrayB[i] << ", and C =" << arrayC[i] << endl;

}

else

{

cout << "(A or (B and C)) and (!A and !B) is false when A = " << arrayA[i] << ", B =" << arrayB[i] << ", and C =" << arrayC[i] << endl;

}

}

// Print fifth logical statement

cout << endl << "[5] ((B and C) or (C and A)) and (!(A or B) and C)" << endl;

// Loop to iterate over arrays

for (int i = 0; i < 8; i++)

{

// statement if true,1 or false,0

if ((((arrayB[i] && arrayC[i]) || (arrayC[i] && arrayA[i])) && (!(arrayA[i] || arrayB[i]) && arrayC[i])))

{

cout << "(A or (B and C)) and (!A and !B) is true when A = " << arrayA[i] << ", B =" << arrayB[i] << ", and C =" << arrayC[i] << endl;

}

else

{

cout << "(A or (B and C)) and (!A and !B) is false when A = " << arrayA[i] << ", B =" << arrayB[i] << ", and C =" << arrayC[i] << endl;

}

}

// Show application close

cout << "\nEnd of Logical Statements!" << endl;

}

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**Screenshot**:

