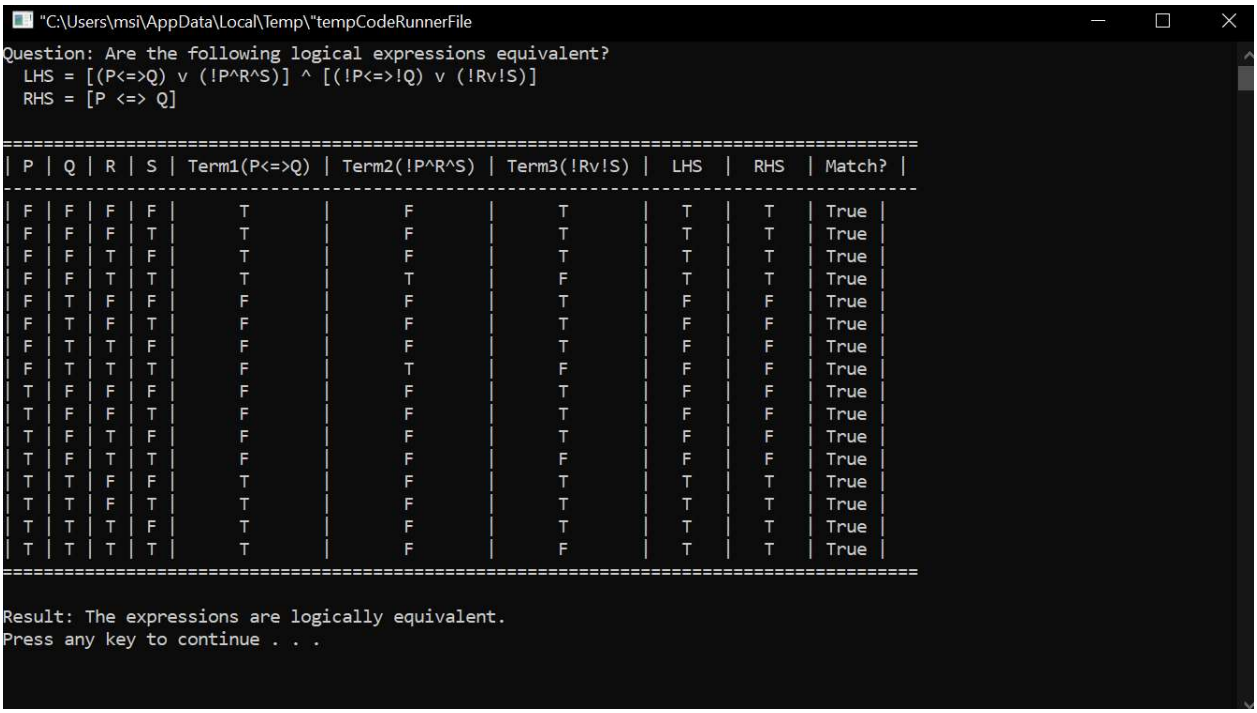
Code :

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

string toTF(bool val) {
    return val ? "T" : "F";
}

string toTrueFalse(bool val) {
    return val ? "True " : "False";
}

int main() {

    cout << "Question: Are the following logical expressions equivalent?\n";
    cout << "  LHS = [(P<=>Q) v (!P^R^S)] ^ [(!P<=>!Q) v (!Rv!S)]\n";
    cout << "  RHS = [P <=> Q]\n";
    cout << "\n";
    cout <<
"================================================================================
=========\n";
    cout << "| P | Q | R | S | Term1(P<=>Q) | Term2(!P^R^S) | Term3(!Rv!S) |  LHS
|  RHS  | Match? |\n";
    cout << "--------------------------------------------------------------------
--------------------\n";

    bool allMatch = true;

    for (int p = 0; p <= 1; p++) {
        for (int q = 0; q <= 1; q++) {
        for (int r = 0; r <= 1; r++) {
        for (int s = 0; s <= 1; s++)



        bool bP = (p == 1);
        bool bQ = (q == 1);
        bool bR = (r == 1);
```

```
        bool bS = (s == 1);


        bool t1 = (bP == bQ);

        bool t2 = (!bP && bR && bS);

        bool t3 = (!bR || !bS);


        bool lhs = (t1 || t2) && (t1 || t3);

        bool rhs = (bP == bQ);

        bool match = (lhs == rhs);
        if (!match) allMatch = false;

        cout << "| " << toTF(bP) << " | " << toTF(bQ) << " | " << toTF(bR) << " |
" << toTF(bS) << " |      "
            << toTF(t1) << "       |       " << toTF(t2) << "       |      " <<
toTF(t3) << "       |   "
             << toTF(lhs) << "   |   " << toTF(rhs) << "   | " <<
toTrueFalse(match) << "|\n";

            }
        }
    }

    cout <<
"=============================================================================
=========\n";

    if (allMatch) {
        cout << "\nResult: The expressions are logically equivalent.\n";
    } else {
        cout << "\nResult: The expressions are NOT logically equivalent.\n";
    }

    system("pause");
    return 0;
}
```


"C:\Users\msi\AppData\Local\Temp\"tempCodeRunnerFile
Question: Are the following logical expressions equivalent?
LHS = [(P<=>Q) v (!P^R^S)] ^ [(!P<=>!Q) v (!Rv!S)]
RHS = [P <=> Q]
P	Q	R	S	Term1(P<=>Q)	Term2(!P^R^S)	Term3(!Rv!S)	LHS	RHS	Match?
F	F	F	F	T	F	T	T	T	True
F	F	F	T	T	F	T	T	T	True
F	F	T	F	T	F	T	T	T	True
F	F	T	T	T	T	F	T	T	True
F	T	F	F	F	F	T	F	F	True
F	T	F	T	F	F	T	F	F	True
F	T	T	F	F	F	T	F	F	True
F	T	T	T	F	T	F	F	F	True
T	F	F	F	F	F	T	F	F	True
T	F	F	T	F	F	T	F	F	True
T	F	T	F	F	F	T	F	F	True
T	F	T	T	F	F	F	F	F	True
T	T	F	F	T	F	T	T	T	True
T	T	F	T	T	F	T	T	T	True
T	T	T	F	T	F	T	T	T	True
T	T	T	T	T	F	F	T	T	True
Result: The expressions are logically equivalent.
Press any key to continue . . .