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#include <bits/stdc++.h>

using namespace std;

int n;

vector<pair<string, int>> prioritati = {"B" , 0b11110000}, {"~B" , 0b00001111},
    {"A" , 0b11001100}, {"C" , 0b01100110},
    {"~A" , 0b00110011}, {"~C" , 0b10011001},
    {"AB" , 0b11000000}, {"~AB" , 0b00110000},
    {"A~B" , 0b00001100}, {"~A~B" , 0b00000011},
    {"A~C" , 0b10001000}, {"AC" , 0b01000100},
    {"~AC" , 0b00100010}, {"~A~C" , 0b00010001},
    {"B~C" , 0b10010000}, {"~B~C" , 0b00001001},
    {"AB~C" , 0b10000000}, {"ABC" , 0b01000000},
    {"~ABC" , 0b00100000}, {"~AB~C" , 0b00010000},
    {"A~B~C" , 0b00001000}, {"A~BC" , 0b00000100},
    {"~A~BC" , 0b00000010}, {"~A~B~C" , 0b00000001}};

int main()
{
    int a, b, c;
    while(cin >> hex >> a)
    {
        b = a;
        c = 0;
        for(auto &i : prioritati)
        {
            if((i.second | a) == a && (i.second & b) != 0)
            {
                if(c != 0)
                    cout << '+';

                c++;

                cout << i.first;

                int d = (i.second & b);

                for(int j = 0; j < 9; j++)

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        if((d & (1 << j)) > 0)
            b ^= (1 << j), a ^= (1 << j);
    }
}
cout << "\n";
}
return 0;
}
```