```
/*
Name: Jay Pang
Team: STEMnArts
Division: Junior
Contest 3
*/

#include <iostream>
#include <vector>

using namespace std;

string HexToBin(char hexdec)
{
	switch (hexdec) {
	case '0':
	   return "0000";
	   break;
	case '1':
	    return "0001";
	   break;
	case '2':
	    return "0010";
	   break;
	case '3':
	   return "0011";
	   break;
	case '4':
	   return "0100";
	   break;
	case '5':
	   return "0101";
	   break;
	case '6':
	   return "0110";
	   break;
	case '7':
	   return "0111";
	   break;
	case '8':
	   return "1000";
	   break;
	case '9':
	   return "1001";
	   break;
	case 'A':
	   return "1010";
	   break;
```

```
        case 'B':
            return "1011";
            break;
        case 'C':
            return "1100";
            break;
        case 'D':
            return "1101";
            break;
        case 'E':
            return "1110";
            break;
        case 'F':
            return "1111";
            break;
        default:
            return "err4";
    }
}


int main()
{//line1,line2,
    string line, tmp, tmp1,tmp2,tmp3,tmp4;
    string r[8]={"110","111","011","010","100","101","001","000"};
    int A=0,B=0,C=0,sum=0;
    char first, second;
    vector <string> b;
    bool flag=false;

    cin>>first>>second;

    line=HexToBin(first);
    line=line+HexToBin(second);
    //cout<<line<<endl;
    if(line=="11111111")
        cout<<"1";
    else if(line=="00000000")
        cout<<"0";
    else
    {
        for(int i=0;i<8;i++)
        {
            if(line[i]=='0')
            {
            r[i]="999";
            }
        }
```

```
   //group in 4 by row
 sum=0;
  for(int i=0;i<4;i++)
  {
     sum+=line[i]-'0';
  }
 // cout<<sum<<endl;
  if(sum==4)
  {
     b.push_back("B");
 for(int i=0;i<4;i++)
     {
        r[i]="999";
     }
  }
  sum=0;
  for(int i=4;i<8;i++)
  {
     sum+=line[i]-'0';
  }
  if(sum==4)
  {
     b.push_back("~B");
 for(int i=4;i<8;i++)
     {
        r[i]="999";
     }
  }
//group in 4 by block
for(int i=0;i<3;i++)
 {
    tmp1=r[i];
    tmp2=r[i+1];
    tmp3=r[i+4];
    tmp4=r[i+5];
    A=tmp1[0]-'0'+tmp2[0]-'0'+tmp3[0]-'0'+tmp4[0]-'0';
    B=tmp1[1]-'0'+tmp2[1]-'0'+tmp3[1]-'0'+tmp4[1]-'0';
    C=tmp1[2]-'0'+tmp2[2]-'0'+tmp3[2]-'0'+tmp4[2]-'0';

    if(A==4)
    {
       b.push_back("A");
       r[i]="999";
       r[i+1]="999";
       r[i+4]="999";
       r[i+5]="999";
    }
    else if(A==0)
    {
```

```
            b.push_back("~A");
            r[i]="999";
            r[i+1]="999";
            r[i+4]="999";
            r[i+5]="999";
        }

        if(B==4)
        {
             b.push_back("B");
            r[i]="999";
            r[i+1]="999";
            r[i+4]="999";
            r[i+5]="999";
        }
        else if(B==0)
        {
             b.push_back("~B");
            r[i]="999";
            r[i+1]="999";
            r[i+4]="999";
            r[i+5]="999";
        }
        if(C==4)
        {
             b.push_back("C");
            r[i]="999";
            r[i+1]="999";
            r[i+4]="999";
            r[i+5]="999";
        }
        else if(C==0)
        {
             b.push_back("~C");
            r[i]="999";
            r[i+1]="999";
            r[i+4]="999";
            r[i+5]="999";
        }

    }
    //group end 4 blocks
        tmp1=r[0];
        tmp2=r[3];
        tmp3=r[4];
        tmp4=r[7];
        C=tmp1[2]-'0'+tmp2[2]-'0'+tmp3[2]-'0'+tmp4[2]-'0';
if(C==0)
{
```

```
    r[0]="999";
    r[3]="999";
    r[4]="999";
    r[7]="999";
    b.push_back("~C");
}
    //group in 2 by row
    for(int i=0;i<7;i++)
       {
       if(i!=3)
       {
       tmp1=r[i];
       tmp2=r[i+1];
       tmp="";
       A=tmp1[0]-'0'+tmp2[0]-'0';
       B=tmp1[1]-'0'+tmp2[1]-'0';
       C=tmp1[2]-'0'+tmp2[2]-'0';
        if(A==2)
       {
         tmp+="A";
       }
       else if(A==0)
       {
          tmp+="~A";
       }
       if(B==2)
       {
           tmp+="B";
       }
       else if(B==0)
       {
          tmp+="~B";
       }
       if(C==2)
       {
           tmp+="C";

       }
       else if(C==0)
       {
          tmp+="~C";
       }
       if(tmp!="")
       {b.push_back(tmp);
        r[i]="999";
        r[i+1]="999";
       }
       }
```

```
        }

//group in 2 by col
      for(int i=0;i<4;i++)
        {
        tmp1=r[i];
        tmp2=r[i+4];
        tmp="";
        A=tmp1[0]-'0'+tmp2[0]-'0';
        B=tmp1[1]-'0'+tmp2[1]-'0';
        C=tmp1[2]-'0'+tmp2[2]-'0';
         if(A==2)
        {
          tmp+="A";
        }
        else if(A==0)
        {
           tmp+="~A";
        }
        if(B==2)
        {
            tmp+="B";
        }
        else if(B==0)
        {
           tmp+="~B";
        }
        if(C==2)
        {
            tmp+="C";
        }
        else if(C==0)
        {
           tmp+="~C";
        }
        if(tmp!="")
        {
           b.push_back(tmp);
           r[i]="999";
           r[i+4]="999";
        }
        }

  if(r[0]=="110" && r[3]=="010")
  {
     r[0]="999";
     r[3]="999";
     b.push_back("B~C");
  }
```

```
    if(r[4]=="100" && r[7]=="000")
    {
       r[4]="999";
       r[7]="999";
       b.push_back("~B~C");
    }

    for(int i=0;i<8;i++)
    {
       tmp=r[i];
       tmp1="";
       if(tmp!="999")
           {
              tmp1="";
           if(tmp[0]=='1')
              tmp1+="A";
           else if(tmp[0]=='0')
              tmp1+="~A";

           if(tmp[1]=='1')
               tmp1+="B";
           else if(tmp[1]=='0')
               tmp1+="~B";

           if(tmp[2]=='1')
               tmp1+="C";
           else if(tmp[2]=='0')
               tmp1+="~C";
            b.push_back(tmp1);
           }
    }

    for(int i=0; i < b.size(); i++)
      {
         cout << b.at(i);
         if(i<b.size()-1)
          cout << '+';
      }
    }

    return 0;
}
```