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import java.util.*; import java.io.*;
public class PriuyankaaBC3IntermediateVeitch2020{
    public static int [][] array = new int [4][4];
    public static void main (String []args) throws Exception {
        File file = new File("data.txt");
        Scanner input = new Scanner(file);
        String a="";
        while (input.hasNextLine()){
            a=input.nextLine();
            System.out.println(veitch(a));

            array = new int [4][4];
        }
    }
    public static void A (int [][] arr){
        for (int i=0; i<=3; i++){
            for(int j=0; j<=1; j++){
                arr[i][j]++;
            }
        }
    }
    public static void notA (int [][] arr){
        for (int i=0; i<=3; i++){
            for(int j=2; j<=3; j++){
                arr[i][j]++;
            }
        }
    }
    public static void B (int [][] arr){
        for (int i=0; i<=1; i++){
            for(int j=0; j<=3; j++){
                arr[i][j]++;
            }
        }
    }
    public static void notB (int [][] arr){
        for (int i=2; i<=3; i++){
            for(int j=0; j<=3; j++){
                arr[i][j]++;
            }
        }
    }
    public static void C (int [][] arr){
        for (int i=0; i<=3; i++){
            for(int j=1; j<=2; j++){
                arr[i][j]++;
            }
        }
    }
    public static void notC (int [][] arr){

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    for(int i=0; i<=3; i++){
        arr[i][0]++;
    }
    for(int i=0; i<=3; i++){
        arr[i][3]++;
    }
}
public static void D (int [][] arr){
    for (int i=1; i<=2; i++){
        for(int j=0; j<=3; j++){
            arr[i][j]++;
        }
    }
}
public static void notD (int [][] arr){
    for(int j=0; j<=3; j++){
        arr[0][j]++;
    }
    for(int j=0; j<=3; j++){
        arr[3][j]++;
    }
}
public static void overlap(int [][] arr, String b, int id){
    String[] a = b.split("[+]");
    int count=0;
    for(int i=0; i<a[id].length(); i++){
        if(a[id].charAt(i)!='~'){
            count++;
        }
    }
    for (int i=0; i<=3; i++){
        for(int j=0; j<=3; j++){
            if(arr[i][j]<count){
                arr[i][j]=0;
            }
        }
    }
}
public static String veitch (String x){
    String[] s = x.split("//+");
    String [] str = x.split("");
    ArrayList<String> z = new ArrayList<String>();
    for(int i=0; i<str.length; i++){
        z.add(str[i]);
    }
    int [][] a1= new int [4][4]; int c=0;
    Boolean op=false;
    for(int k=0; k<z.size(); k++){
        if(z.get(k).equals("~")){
            op=true;
        }
    }
}

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    }
    else if(z.get(k).equals("A")){
        if(op){
            notA(a1);
            op=false;
        }
        else{
            A(a1);
        }
    }
    else if(z.get(k).equals("B")){
        if(op){
            notB(a1);
            op=false;
        }
        else{
            B(a1);
        }
    }
    else if(z.get(k).equals("C")){
        if(op){
            notC(a1);
            op=false;
        }
        else{
            C(a1);
        }
    }
    else if(z.get(k).equals("D")){
        if(op){
            notD(a1);
            op=false;
        }
        else{
            D(a1);
        }
    }
    else if(z.get(k).equals("+")){
        c++;
        overlap(a1,x,c-1);
        print(a1);
        a1= new int [4][4];
    }
}
overlap(a1,x,c);
print(a1);

print(array);

String answer="";
for (int i=0; i<4; i++){

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String a="";int b=0;
for(int j=0; j<4; j++){
    a+=Integer.toString(array[i][j]);
}
b= Integer.parseInt(a, 2);
String convert=Integer.toHexString(b);
answer+=convert;
}
answer=answer.toUpperCase();
return answer;
}
public static void print(int [][] arr){
    for (int i=0; i<=3; i++){
        for(int j=0; j<=3; j++){
            if(arr[i][j]!=0){
                arr[i][j]=1;
                array[i][j]=1;
            }
        }
    }
}
}
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