

```

A = {(0,0),(1,0),(2,0),(3,0),(0,1),(1,1),(2,1),(3,1)}
NA = {(0,2),(1,2),(2,2),(3,2),(0,3),(1,3),(2,3),(3,3)}
B = {(0,0),(0,1),(0,2),(0,3),(1,0),(1,1),(1,2),(1,3)}
NB = {(2,0),(2,1),(2,2),(2,3),(3,0),(3,1),(3,2),(3,3)}
C = {(0,1),(1,1),(2,1),(3,1),(0,2),(1,2),(2,2),(3,2)}
NC = {(0,0),(1,0),(2,0),(3,0),(0,3),(1,3),(2,3),(3,3)}
D = {(1,0),(1,1),(1,2),(1,3),(2,0),(2,1),(2,2),(2,3)}
ND = {(0,0),(0,1),(0,2),(0,3),(3,0),(3,1),(3,2),(3,3)}
result = A | NA
sum = set()
brd = [[0 for j in range(4)] for i in range(4)]
cal_sum = 0

```

```

def multi(n):
    Y_N = 1 ;
    global result ;
    result = A | NA
    for i in n:
        #print(i)
        if i == 'A' and Y_N == 1 :
            #print(i)
            result = result & A ;
            #print(result)
        elif i == 'B' and Y_N == 1:
            #print(i)
            result = result & B ;
            #print(result)
        elif i == 'C' and Y_N == 1:
            #print(i)
            result = result & C ;
            #print(result)
        elif i == 'D' and Y_N == 1:
            #print(i)
            result = result & D ;
            #print(result)
        elif i == '~':
            Y_N = Y_N * -1 ;
        elif i == 'A' and Y_N == -1 :
            #print(i)
            result = result & NA ;
            #print(result)
            Y_N = 1;
        elif i == 'B' and Y_N == -1:
            #print(i)
            result = result & NB ;
            #print(result)
            Y_N = 1;
        elif i == 'C' and Y_N == -1:
            #print(i)
            result = result & NC ;
            #print(result)
            Y_N = 1;
        elif i == 'D' and Y_N == -1:
            #print(i)
            result = result & ND ;
            #print(result)
            Y_N = 1;

```

```

file2 = open('output.txt' , 'w')
with open('input.txt', 'r') as file:
    for line in file:
        s = line.strip('\n')
        let = s.split('+')

```

```
brd = [[0 for j in range(4)] for i in range(4)]  
sum.clear()
```

```
for i in let:  
    #print(i);  
    multi(i);  
    sum = sum | result;
```

```
for r,c in sum:  
    brd[r][c] = 1;
```

```
for i in brd:  
    cal_sum = 0  
    for j in range(4):  
        cal_sum += (i[j]*2**(3-j))  
    file2.write(format(cal_sum, 'X'))
```

```
file2.write('Wn')
```

```
file2.close()
```