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from sys import stdin as s

def h(x):
    return hex(x)[2:]

pos={"A":(1,(2,3)), "~A":(1,(0,1)), "B":(0,(2,3)), "~B":(0,(0,1)), "C":(1,(0,3)), "~C":(1,(1,2)), "D":(0,(0,3)),
"~D":(0,(1,2))}

for i in s:
    finalarray=[[0,0,0,0] for j in range(4)]
    t=i.rstrip().split("+")
    for j in t:
        temparray=[[1,1,1,1] for k in range(4)]
        state=1
        for k in j:
            if k.isalpha():
                if state:
                    x,y=pos[k]
                    if x==1:
                        for l in y:
                            for m in range(4):
                                temparray[m][l]=0
                    else:
                        for l in y:
                            for m in range(4):
                                temparray[l][m]=0
                else:
                    x,y=pos["~"+k]
                    if x==1:
                        for l in y:
                            for m in range(4):
                                temparray[m][l]=0
                    else:
                        for l in y:
                            for m in range(4):
                                temparray[l][m]=0
            state=1
        else:
            state=0
        for k in range(4):
            for l in range(4):
                if temparray[k][l]:
                    finalarray[k][l]=1
    for j in range(4):
        print("%X" % sum((2**(3-k)*finalarray[j][k] for k in range(4))), end=" ")
    print()

```