

```

N = 4
def main():

    s = [1,0,1,0]
    t = [1,1,0,0]
    a=[]
    b=[]
    c=[]
    d=[]
    e=[]

    for i in range(N):
        a.append(not(s[i] or t[i]))
        b.append(bool(s[i] and t[i]))
        c.append(bool(t[i] or(not(t[i]))))
        d.append(not(bidir(s[i],s[i])))
        e.append(imp((not(s[i])),(not(t[i]))))

    print("Truth table of a: ",a)
    print("Truth table of b: ", b)
    print("Truth table of c: ", c)
    print("Truth table of d: ", d)
    print("Truth table of e: ", e)

    p=entails(a, b)
    q=entails(a,c)
    r=entails(a, d)
    s=entails(a, e)
    print("a entails b: ",p)
    print("a entails c: ", q)
    print("a entails d: ", r)
    print("a entails e: ", s)


def imp(j,k):
    return (not(j)) or k

def bidir(j,k):
    return (imp(j,k) and imp(j,k))

def entails(m,n):
    #for i in j:
    for i in range(N):
        for j in range(N):
            if (m[i] and n[j]== 1):
                if(i==j):
                    return "yes"
                break

    return "NO"

```

```
if __name__ == '__main__':  
    main()  
  
    Truth table of a: [False, False, False, True]  
    Truth table of b: [True, False, False, False]  
    Truth table of c: [True, True, True, True]  
    Truth table of d: [False, False, False, False]  
    Truth table of e: [True, False, True, True]  
    a entails b: NO  
    a entails c: yes  
    a entails d: NO  
    a entails e: yes
```

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