**Program 4**

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()