**7. Write a program to construct aBayesian network considering medical data. Use this model to demonstrate the diagnosis of heart patients using standard Heart Disease Data Set. You can use Java/Python ML library classes/API.**

from pomegranate import\*

asia= DiscreteDistribution({'True':0.5,'False':0.5})

tuberculosis=ConditionalProbabilityTable(

[['True','True',0.2],

['True','False',0.8],

['False','True',0.01],

['False','False',0.99]],[asia])

smoking=DiscreteDistribution({'True':0.5,'False':0.5})

lung=ConditionalProbabilityTable(

[['True','True',0.75],

['True','False',0.25],

['False','True',0.02],

['False','False',0.98]],[smoking])

bronchitis=ConditionalProbabilityTable(

[['True','True',0.92],

['True','False',0.08],

['False','True',0.03],

['False','False',0.97]],[smoking])

tuberculosis\_or\_cancer=ConditionalProbabilityTable(

[['True','True','True',1.0],

['True','True','False',0.0],

['True','False','True',1.0],

['True','False','False',0.0],

['False','True','True',1.0],

['False','True','False',0.0],

['False','False','True',0.0],

['False','False','False',1.0]],[tuberculosis,lung])

xray=ConditionalProbabilityTable(

[['True','True',0.885],

['True','False',0.115],

['False','True',0.04],

['False','False',0.96]],[tuberculosis\_or\_cancer])

dyspnea=ConditionalProbabilityTable(

[['True','True','True',0.96],

['True','True','False',0.04],

['True','False','True',0.89],

['True','False','False',0.11],

['False','True','True',0.96],

['False','True','False',0.04],

['False','Flase','True',0.89],

['False','False','False',0.11]],[tuberculosis\_or\_cancer,bronchitis])

s0=State(asia,name='asia')

s1=State(tuberculosis,name="tuberculosis")

s2=State(smoking,name="smoker")

network=BayesianNetwork("asia")

network.add\_nodes(s0,s1,s2)

network.add\_edge(s0,s1)

network.add\_edge(s1,s2)

network.bake()

print(network.predict\_proba({'tuberculosis':'True'}))

**Output:**

[{

"class" :"Distribution",

"dtype" :"str",

"name" :"DiscreteDistribution",

"parameters" :[

{

"True" :0.9523809523809521,

"False" :0.04761904761904782

}

],

"frozen" :false

}

'True'

{

"class" :"Distribution",

"dtype" :"str",

"name" :"DiscreteDistribution",

"parameters" :[

{

"True" :0.5,

"False" :0.5

}

],

"frozen" :false

}]