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**Class: ISE 7B**

**Machine Learning Laboratory**

Program 7

**Write a program to construct a Bayesian 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.**

**PROGRAM:**

import numpy as np

import pandas as pd

import csv

from pgmpy.estimators import MaximumLikelihoodEstimator

from pgmpy.models import BayesianModel

from pgmpy.inference import VariableElimination

heartDisease = pd.read\_csv('Data7.csv')

heartDisease = heartDisease.replace("?",np.nan)

print("Few examples from dataset are given below")

print(heartDisease.head())

print("Attributes and data types")

print(heartDisease.dtypes)

model = BayesianModel([('age','trestbps'),('age','fbs'),('sex','trestbps'),

('sex','trestbps'),('exang','trestbps'),('trestbps','heartdisease'),

('fbs','heartdisease'),('heartdisease','restecg'),('heartdisease','thalach'),

('heartdisease','chol')])

print("Learning CPDs using maximum likelihood estimators...")

model.fit(heartDisease,estimator=MaximumLikelihoodEstimator)

print("\nInferencing the bayesian network:")

HeartDisease\_infer = VariableElimination(model)

print("\n1.Probability of heart disease given age=28")

q = HeartDisease\_infer.query(variables=['heartdisease'],evidence={'age':28})

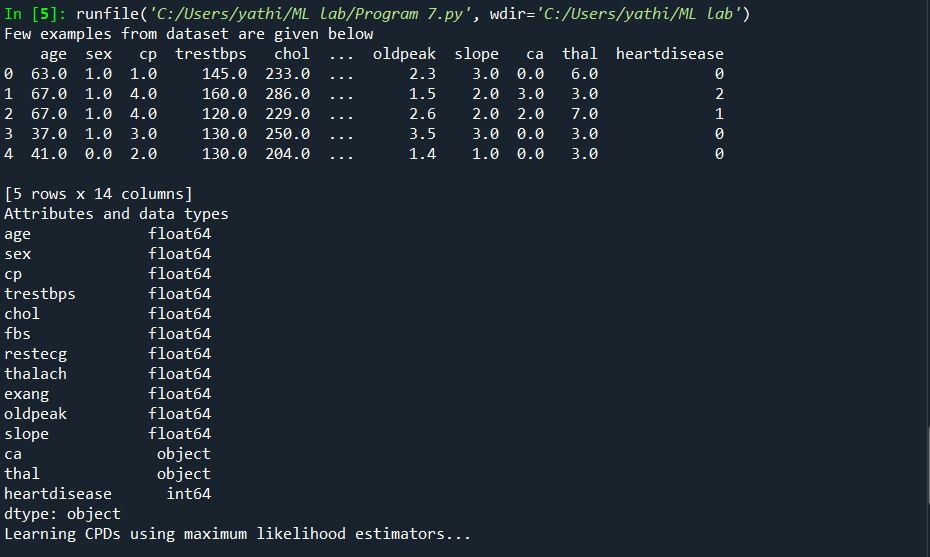
print(q)

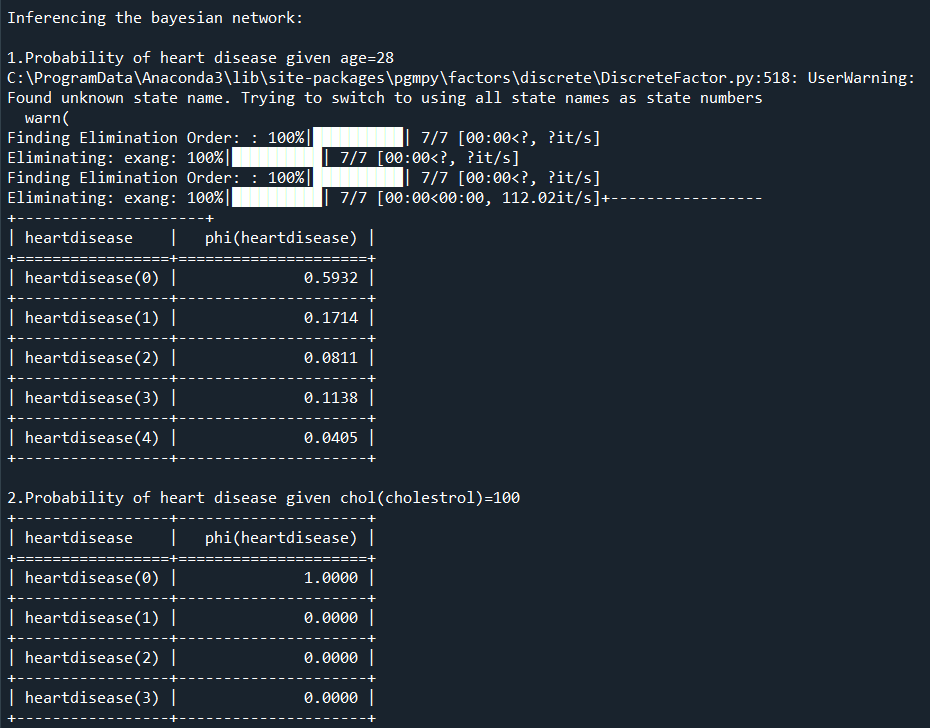
print("\n2.Probability of heart disease given chol(cholestrol)=100")

q = HeartDisease\_infer.query(variables=['heartdisease'],evidence={'chol':130})

print(q)

**OUTPUT:**

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