**Experiment 9**

**Program:-**

from pgmpy.models import DiscreteBayesianNetwork

from pgmpy.factors.discrete import TabularCPD

from pgmpy.inference import VariableElimination

# Define network structure: Rain -> Traffic

model = DiscreteBayesianNetwork([('Rain', 'Traffic')])

# Define CPDs

cpd\_rain = TabularCPD(variable='Rain', variable\_card=2, values=[[0.8], [0.2]]) # 0: No rain, 1: Rain

cpd\_traffic = TabularCPD(variable='Traffic', variable\_card=2,

values=[[0.9, 0.4], # P(Traffic=Light | Rain)

[0.1, 0.6]], # P(Traffic=Heavy | Rain)

evidence=['Rain'],

evidence\_card=[2])

# Add CPDs to model

model.add\_cpds(cpd\_rain, cpd\_traffic)

# Validate model

model.check\_model()

# Perform inference

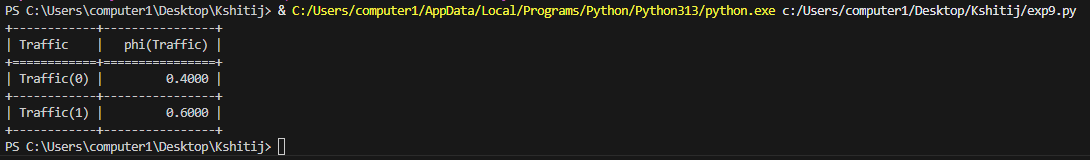
inference = VariableElimination(model)

# Query: Probability of heavy traffic given it is raining

result = inference.query(variables=['Traffic'], evidence={'Rain': 1})

print(result)

**Output:-**

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