Step 1: run this command in jupyter notebook

!pip install pgmpy --user and for normal terminal :

pip install pgmpy --user

Step 2:

from pgmpy.models import BayesianNetwork

from pgmpy.factors.discrete import TabularCPD

from pgmpy.inference import VariableElimination

# Define the structure of the Bayesian Network

model = BayesianNetwork([('A', 'C'), ('B', 'C'), ('C', 'D')])

# Define Conditional Probability Distributions (CPDs)

cpd\_A = TabularCPD(variable='A', variable\_card=2, values=[[0.8], [0.2]])

cpd\_B = TabularCPD(variable='B', variable\_card=2, values=[[0.7], [0.3]])

cpd\_C = TabularCPD(variable='C', variable\_card=2,

values=[[0.9, 0.6, 0.7, 0.1],

[0.1, 0.4, 0.3, 0.9]],

evidence=['A', 'B'], evidence\_card=[2, 2])

cpd\_D = TabularCPD(variable='D', variable\_card=2,

values=[[0.95, 0.8], [0.05, 0.2]],

evidence=['C'], evidence\_card=[2])

# Add CPDs to the Bayesian Network

model.add\_cpds(cpd\_A, cpd\_B, cpd\_C, cpd\_D)

# Check if the model is valid (i.e., CPDs are consistent)

model.check\_model()

# Take user input for evidence on nodes 'A' and 'B'

evidence\_A = int(input("Enter evidence for node A (0 or 1): "))

evidence\_B = int(input("Enter evidence for node B (0 or 1): "))

# Perform Variable Elimination for inference with user-provided evidence

inference = VariableElimination(model)

query\_result = inference.query(variables=['D'], evidence={'A': evidence\_A, 'B': evidence\_B})

# Print the query result

print(query\_result)

output:

Enter evidence for node A (0 or 1): 1

Enter evidence for node B (0 or 1): 1

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| D | phi(D) |

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| D(0) | 0.8150 |

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| D(1) | 0.1850 |

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