

In [2]:

```
from pgmpy.models import BayesianModel
from pgmpy.inference import VariableElimination
from pgmpy.factors.discrete import TabularCPD
```

In [3]:

```
alarm_model = BayesianModel([('Burglary', 'Alarm'),
                             ('Earthquake', 'Alarm'),
                             ('Alarm', 'JohnCalls'),
                             ('Alarm', 'MaryCalls')])

cpd_burglary = TabularCPD(variable='Burglary', variable_card=2,
                          values=[[.999], [0.001]])
cpd_earthquake = TabularCPD(variable='Earthquake', variable_card=2,
                             values=[[0.998], [0.002]])
cpd_alarm = TabularCPD(variable='Alarm', variable_card=2,
                       values=[[0.999, 0.71, 0.06, 0.05],
                               [0.001, 0.29, 0.94, 0.95]],
                       evidence=['Burglary', 'Earthquake'],
                       evidence_card=[2, 2])
cpd_johncalls = TabularCPD(variable='JohnCalls', variable_card=2,
                            values=[[0.95, 0.1], [0.05, 0.9]],
                            evidence=['Alarm'], evidence_card=[2])
cpd_marycalls = TabularCPD(variable='MaryCalls', variable_card=2,
                            values=[[0.1, 0.7], [0.9, 0.3]],
                            evidence=['Alarm'], evidence_card=[2])

alarm_model.add_cpds(cpd_burglary, cpd_earthquake, cpd_alarm, cpd_johncalls, cpd_marycalls)
```

In [4]:

```
alarm_model.check_model()
```

Out[4]:

True

In [5]:

```
alarm_model.nodes()
```

Out[5]:

```
NodeView(('Burglary', 'Alarm', 'Earthquake', 'JohnCalls', 'MaryCalls'))
```

In [6]:

```
alarm_model.edges()
```

Out[6]:

```
OutEdgeView([('Burglary', 'Alarm'), ('Alarm', 'JohnCalls'), ('Alarm', 'MaryC
alls'), ('Earthquake', 'Alarm')])
```

In [7]:



```
alarm_model.local_independencies('Burglary')
```

Out[7]:

(Burglary \perp Earthquake)

In [10]:



```
alarm_model.local_independencies('JohnCalls')
```

Out[10]:

(JohnCalls \perp MaryCalls, Earthquake, Burglary | Alarm)

In [12]:



```
alarm_model.get_independencies()
```

Out[12]:

(Burglary \perp Earthquake)
 (Burglary \perp JohnCalls, MaryCalls | Alarm)
 (Burglary \perp MaryCalls | JohnCalls, Alarm)
 (Burglary \perp JohnCalls, MaryCalls | Earthquake, Alarm)
 (Burglary \perp JohnCalls | MaryCalls, Alarm)
 (Burglary \perp MaryCalls | JohnCalls, Earthquake, Alarm)
 (Burglary \perp JohnCalls | MaryCalls, Earthquake, Alarm)
 (Earthquake \perp Burglary)
 (Earthquake \perp JohnCalls, MaryCalls | Alarm)
 (Earthquake \perp MaryCalls | JohnCalls, Alarm)
 (Earthquake \perp JohnCalls | MaryCalls, Alarm)
 (Earthquake \perp JohnCalls, MaryCalls | Alarm, Burglary)
 (Earthquake \perp MaryCalls | JohnCalls, Alarm, Burglary)
 (Earthquake \perp JohnCalls | MaryCalls, Alarm, Burglary)
 (JohnCalls \perp MaryCalls, Earthquake, Burglary | Alarm)
 (JohnCalls \perp Earthquake, Burglary | MaryCalls, Alarm)
 (JohnCalls \perp MaryCalls, Burglary | Earthquake, Alarm)
 (JohnCalls \perp MaryCalls, Earthquake | Alarm, Burglary)
 (JohnCalls \perp Burglary | MaryCalls, Earthquake, Alarm)
 (JohnCalls \perp Earthquake | MaryCalls, Alarm, Burglary)
 (JohnCalls \perp MaryCalls | Earthquake, Alarm, Burglary)
 (MaryCalls \perp JohnCalls, Earthquake, Burglary | Alarm)
 (MaryCalls \perp Earthquake, Burglary | JohnCalls, Alarm)
 (MaryCalls \perp JohnCalls, Burglary | Earthquake, Alarm)
 (MaryCalls \perp JohnCalls, Earthquake | Alarm, Burglary)
 (MaryCalls \perp Burglary | JohnCalls, Earthquake, Alarm)
 (MaryCalls \perp Earthquake | JohnCalls, Alarm, Burglary)
 (MaryCalls \perp JohnCalls | Earthquake, Alarm, Burglary)

In []:



