Task

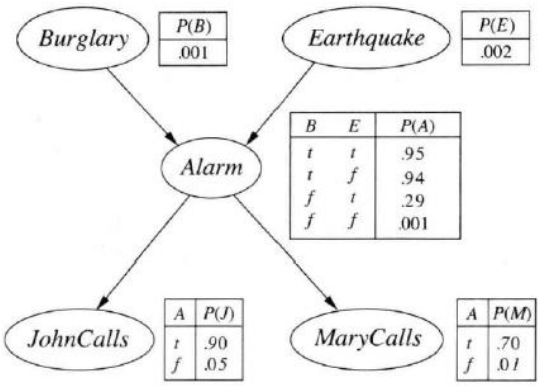
Task1: 三门问题

计算:

P(['A', 'C', 'B'])

P((['A', 'C', 'A']))

Task2: Burglary



计算:

P(JohnCalls, MaryCalls)

P(Burglary, Earthquake, Alarm, JohnCalls, MaryCalls)

P(Alarm | JohnCalls, MaryCalls)

P(JohnCalls, ¬ MaryCalls | ¬ Burglary)

Task3：Diagnosing

Variables and their domais

(1) PatientAge:['0−30','31−65','65+']
(2) CTScanResult:['Ischemic Stroke','Hemmorraghic Stroke']
(3) MRIScanResult: ['Ischemic Stroke','Hemmorraghic Stroke']
(4) StrokeType: ['Ischemic Stroke','Hemmorraghic Stroke', 'Stroke Mimic']
(5) Anticoagulants: ['Used','Not used']
(6) Mortality:['True', 'False']
(7) Disability: ['Negligible', 'Moderate', 'Severe']

CPTs

Note: [CTScanResult, MRIScanResult,StrokeType] means:
P(StrokeType='...' | CTScanResult='...' ∧ MRIScanResult='...')

(1)
[PatientAge]

['0−30', 0.10],
['31−65', 0.30],
['65+', 0.60]

(2)
[CTScanResult]

['Ischemic Stroke',0.7],
['Hemmorraghic Stroke',0.3]

(3)
[MRIScanResult]

['Ischemic Stroke',0.7],
['Hemmorraghic Stroke',0.3]

(4)

[Anticoagulants]

['Used',0.5],
['Not used',0.5]

(5)
[CTScanResult, MRIScanResult, StrokeType])

['Ischemic Stroke','Ischemic Stroke','Ischemic Stroke',0.8],
['Ischemic Stroke','Hemmorraghic Stroke','Ischemic Stroke',0.5],
['Hemmorraghic Stroke','Ischemic Stroke','Ischemic Stroke',0.5],
['Hemmorraghic Stroke','Hemmorraghic Stroke','Ischemic Stroke',0],

['Ischemic Stroke','Ischemic Stroke','Hemmorraghic Stroke',0],
['Ischemic Stroke','Hemmorraghic Stroke','Hemmorraghic Stroke',0.4],
['Hemmorraghic Stroke','Ischemic Stroke','Hemmorraghic Stroke',0.4],
['Hemmorraghic Stroke','Hemmorraghic Stroke','Hemmorraghic Stroke',0.9],

['Ischemic Stroke','Ischemic Stroke','Stroke Mimic',0.2],
['Ischemic Stroke','Hemmorraghic Stroke','Stroke Mimic',0.1],
['Hemmorraghic Stroke','Ischemic Stroke','Stroke Mimic',0.1],
['Hemmorraghic Stroke','Hemmorraghic Stroke','Stroke Mimic',0.1],

(6)
[StrokeType, Anticoagulants, Mortality]

['Ischemic Stroke', 'Used', 'False',0.28],
['Hemmorraghic Stroke', 'Used', 'False',0.99],
['Stroke Mimic', 'Used', 'False',0.1],
['Ischemic Stroke','Not used', 'False',0.56],
['Hemmorraghic Stroke', 'Not used', 'False',0.58],
['Stroke Mimic', 'Not used', 'False',0.05],

['Ischemic Stroke', 'Used' ,'True',0.72],
['Hemmorraghic Stroke', 'Used', 'True',0.01],
['Stroke Mimic', 'Used', 'True',0.9],
['Ischemic Stroke', 'Not used' ,'True',0.44],
['Hemmorraghic Stroke', 'Not used', 'True',0.42],
['Stroke Mimic', 'Not used', 'True',0.95]

(7)

[StrokeType, PatientAge, Disability]

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['Ischemic Stroke',    '0-30','Negligible', 0.80],
['Hemmorraghic Stroke', '0-30','Negligible', 0.70],
['Stroke Mimic',        '0-30', 'Negligible',0.9],
['Ischemic Stroke',     '31-65','Negligible', 0.60],
['Hemmorraghic Stroke', '31-65','Negligible', 0.50],
['Stroke Mimic',        '31-65', 'Negligible',0.4],
['Ischemic Stroke',     '65+'  , 'Negligible',0.30],
['Hemmorraghic Stroke', '65+'  , 'Negligible',0.20],
['Stroke Mimic',        '65+'  , 'Negligible',0.1],

['Ischemic Stroke',     '0-30' ,'Moderate',0.1],
['Hemmorraghic Stroke', '0-30' ,'Moderate',0.2],
['Stroke Mimic',        '0-30' ,'Moderate',0.05],
['Ischemic Stroke',     '31-65','Moderate',0.3],
['Hemmorraghic Stroke', '31-65','Moderate',0.4],
['Stroke Mimic',        '31-65','Moderate',0.3],
['Ischemic Stroke',     '65+'  ,'Moderate',0.4],
['Hemmorraghic Stroke', '65+'  ,'Moderate',0.2],
['Stroke Mimic',        '65+'  ,'Moderate',0.1],

['Ischemic Stroke',     '0-30' ,'Severe',0.1],
['Hemmorraghic Stroke', '0-30' ,'Severe',0.1],
['Stroke Mimic',        '0-30' ,'Severe',0.05],


['Ischemic Stroke',     '31-65','Severe',0.1],
['Hemmorraghic Stroke', '31-65','Severe',0.1],
['Stroke Mimic',        '31-65','Severe',0.3],
['Ischemic Stroke',     '65+'  ,'Severe',0.3],
['Hemmorraghic Stroke', '65+'  ,'Severe',0.6],
['Stroke Mimic',        '65+'  ,'Severe',0.8]
```

① 在实验报告中画出该任务的贝叶斯网络结构图

② 计算:

p1 = P(Mortality='True' | PatientAge='0-30' , CTScanResult='Ischemic Stroke')

p2 = P(Disability=' Severe ' | PatientAge='65+' , MRIScanResult=' Ischemic Stroke ')

p3 = P(StrokeType='Stroke Mimic' | PatientAge='65+' , CTScanResult='Hemmorraghic Stroke' , MRIScanResult='Ischemic Stroke')

p4 = P(Mortality='False' | PatientAge='0-30', Anticoagulants=’Used’, StrokeType='Stroke Mimic')

p5 = P(PatientAge='0-30', CTScanResult='Ischemic Stroke', MRIScanResult=' 'Hemmorraghic Stroke' , Anticoagulants=’Used’, StrokeType='Stroke Mimic' , Disability=' Severe' , Mortality ='False')