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CPTS 440

Artificial Intelligence

10-24-2019

Homework 8

1.

A)

Breeze = {¬b1,1, ¬b2,1, ¬b3,1, ¬b3,2, b3,3}

Known = {¬p1,1, ¬p2,1, ¬p3,1, ¬p3,2, ¬p3,3}

Frontier = {p2,3, p4,3}

Query = {p3,4}

Other = {the other 8 spots}

B)

**P**(Pit3,4 | breeze, known)

P(Pit3,4 ^ breeze ^ known)

aP(Pit3,4 ^ breeze ^ known ^ unknown)

a

a

a

a

after plug and chug we get P(Pit3,4) = 0.31

2.

Weather

Costume

Party

P(Weather)

P(Costume)

P(MakeFriends|Party)

|  |  |
| --- | --- |
| Clear | 0.2 |
| Cloudy | 0.5 |
| Rain | 0.3 |

|  |  |
| --- | --- |
| Yes | 0.6 |
| No | 0.4 |

|  |  |  |  |
| --- | --- | --- | --- |
| Weather | Costume | Yes | No |
| Clear | Yes | 0.7 | 0.3 |
| Clear | No | 0.4 | 0.6 |
| Cloudy | Yes | 0.6 | 0.4 |
| Cloudy | No | 0.3 | 0.7 |
| Rain | Yes | 0.5 | 0.5 |
| Rain | No | 0.2 | 0.8 |

3.

A) P(AIDone = true, Costume = false, Party = true, HaveFun = true, MakeFriends = true) =

(0.4) (0.7) (0.5) (0.6) (0.7) = **0.0588**

B) P(HaveFun = true | AIDone = false, Costume = true) =

P(Costume = true) \* (P(Party) \* P(HaveFun|Party) + P(!Party) \* P(Fun|!Party)) =

0.3 \* (0.4 \* 0.6 + 0.6 \* 0.2) = **0.108**

C) P(AIDone = true | HaveFun = true, MakeFriends = true) =

P(A|B) = (P(A) ^ P(B)) / P(B)

P(AIDone=true) \* P(Party = true|AIDone = true) \* P(HaveFun=true|Party=true)) \* P(MakeFriends=true|Party=true) +

P(AIDone=true) \* P(Party =false|AIDone = true) \* P(HaveFun=true|Party=false)) \* P(MakeFriends=true|Party=false)

= (0.4 \* (0.9 \* 0.3) \* 0.6 \* 0.7) + (0.4 \* (0.1 \* 0.3) \* 0.2 \* 0.4) = **0.04632**