**B551 – Elements of Artificial Intelligence – PA - 2**

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Question 1)

Alarm is false, infer Burglary and JohnCalls being true

Table 1

Alarm is false, infer Burglary being true

|  |  |  |  |
| --- | --- | --- | --- |
| **Num Samples** | **Prior Sampling** | **Rejection** | **LW** |
| 10 | 0 | 0 | 0 |
| 50 | 0 | 0 | 0 |
| 100 | 0 | 0 | 0.000121 |
| 200 | 0 | 0 | 0.000121 |
| 500 | 0 | 0.0002 | 0.00002 |
| 1000 | 0.00010 | 0.0001 | 0.000060 |
| 10000 | 0.00006 | 0.00009 | 0.0000649 |
| Exact | 0.00006013 | | |

Table 2

Alarm is false, infer JohnCalls being true

|  |  |  |  |
| --- | --- | --- | --- |
| **Num Samples** | **Prior Sampling** | **Rejection** | **LW** |
| 10 | 0.02 | 0.04 | 0.003 |
| 50 | 0.03604 | 0.04 | 0.0520 |
| 100 | 0.05008 | 0.041 | 0.0641 |
| 200 | 0.04856 | 0.0505 | 0.0555 |
| 500 | 0.05077 | 0.0477 | 0.0536 |
| 1000 | 0.04834 | 0.0513 | 0.05 |
| 10000 | 0.04952 | 0.0499 | 0.05 |
| Exact | 0.05 | | |

Question 2)

JohnCalls is true, Earthquake is false, infer Burglary and MaryCalls being true.

Table 1

JohnCalls is true, Earthquake is false, infer Burglary being true

|  |  |  |  |
| --- | --- | --- | --- |
| **Num Samples** | **Prior Sampling** | **Rejection** | **LW** |
| 10 | 0 | 0.02 | 0 |
| 50 | 0 | 0.026 | 0 |
| 100 | 0.0342 | 0.013 | 0 |
| 200 | 0.0490 | 0.01600 | 0.047 |
| 500 | 0.03435 | 0.0172 | 0.020 |
| 1000 | 0.0115 | 0.0178 | 0.0164 |
| 10000 | 0.0161 | 0.01684 | 0.0157 |
| Exact | 0.016438 | | |

Table 2

JohnCalls is true, Earthquake is false, infer MaryCalls being true

|  |  |  |  |
| --- | --- | --- | --- |
| **Num Samples** | **Prior Sampling** | **Rejection** | **LW** |
| 10 | 0.1 | 0.04 | 0.78 |
| 50 | 0.025 | 0.028 | 0.71 |
| 100 | 0 | 0.03 | 0.70 |
| 200 | 0.03 | 0.027 | 0.70 |
| 500 | 0.048 | 0.036 | 0.69 |
| 1000 | 0.0406 | 0.0341 | 0.69 |
| 10000 | 0.03413 | 0.03247 | 0.69 |
| Exact | 0.0333 | | |

Question 3)

MaryCalls is true and JohnCalls is false, infer Burglary and Earthquake being true

Table 1

MaryCalls is true and JohnCalls is false, infer Burglary being true

|  |  |  |  |
| --- | --- | --- | --- |
| **Num Samples** | **Prior Sampling** | **Rejection** | **LW** |
| 10 | 0 | 0 | 0 |
| 50 | 0 | 0.006 | 0 |
| 100 | 0 | 0.006 | 0.0138 |
| 200 | 0 | 0.0075 | 0 |
| 500 | 0 | 0.007 | 0.010 |
| 1000 | 0 | 0.006 | 0.0059 |
| 10000 | 0.0065 | 0.00679 | 0.0068 |
| Exact | 0.00687 | | |

Table 2

MaryCalls is true and JohnCalls is false, infer Earthquake being true

|  |  |  |  |
| --- | --- | --- | --- |
| **Num Samples** | **Prior Sampling** | **Rejection** | **LW** |
| 10 | 0 | 0 | 0 |
| 50 | 0 | 0.01 | 0.0168 |
| 100 | 0 | 0.005 | 0.0019 |
| 200 | 0 | 0.004 | 0.006 |
| 500 | 0 | 0.0062 | 0.011 |
| 1000 | 0 | 0.004 | 0.0053 |
| 10000 | 0.0092 | 0.0054 | 0.00562 |
| Exact | 0.005612 | | |