

13. Artificial Intelligence and Machine Learning

Starter Quiz ·

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Name: _____ Score: _____

1. A* chooses the node minimising –

☐ $f = g + h$

☐ $g(n)$

☐ depth

☐ $h(n)$

2. Forward chaining starts from –

☐ negation

☐ the facts

☐ the empty clause

☐ the query

3. A Bayesian network factorises –

☐ the prior

☐ the joint into CPTs

☐ the loss

☐ the graph

4. The decision boundary is where –

☐ features are scaled

☐ the model changes its answer

☐ training data lies

☐ the loss is zero

5. The update rule steps –

☐ along the contour

☐ randomly

☐ with the gradient

☐ against the gradient

6. The test set is –

☐ reused for tuning

- ☐ optional
 - ☐ spent once, at the end
 - ☐ merged into training
7. City recall 0.90, rural 0.75: the disparity is –
- ☐ 5 points
 - ☐ 25 points
 - ☐ 15 points
 - ☐ not measurable
8. On the course graph, A* expands – nodes before the goal
- ☐ four
 - ☐ two
 - ☐ six
 - ☐ all
9. The course KB derives RefundRisk in – waves
- ☐ never
 - ☐ one
 - ☐ three
 - ☐ two
10. With the course numbers, $P(\text{Storm} \mid \text{Complaint}) = -$
- ☐ 0.1475
 - ☐ 0.49
 - ☐ 0.667
 - ☐ 0.976

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1. **$f = g + h$**

Cost so far plus admissible estimate to go.

2. **the facts**

Flood from what is known; backward chaining aims from the goal.

3. **the joint into CPTs**

Each node keeps a CPT given its parents; the joint is their product.

4. **the model changes its answer**

The score crosses zero: the answer flips.

5. **against the gradient**

Downhill is the negative gradient, scaled by eta.

6. **spent once, at the end**

Spent once: it becomes a second validation set otherwise.

7. **15 points**

0.90 - 0.75: one in four rural lates missed vs one in ten.

8. **four**

Pops D, B, C, then G at cost 8 - four expansions.

9. **two**

Wave one: Delayed, HeavyTraffic; wave two: RefundRisk.

10. **0.976**

$0.49 \times 0.3 / 0.2205 = 0.667$ - marginalise D both ways first.