

Unit 4 - Week 3-Forms of Representation

Course outline

How does an NPTEL online course work?

Week 1-Introduction to the Machine Learning course

Week 2-Characterization of Learning Problems

Week 3-Forms of Representation

- Forms of Representation
- Decision Trees
- Bayes (ian) Belief Networks
- Artificial Neural Networks
- Genetic algorithms
- Logic Programming
- Lecture Notes
- Quiz : Assignment 3**
- Week 3 Feedback

Week 4-Inductive Learning based on Symbolic Representations and Weak Theories

Week 5-Learning enabled by Prior Theories

Week 6-Machine Learning based Artificial Neural Networks

Week 7 - Tools and Resources and Interdisciplinary Inspiration

Text Transcripts

Download Videos

Assignment 3

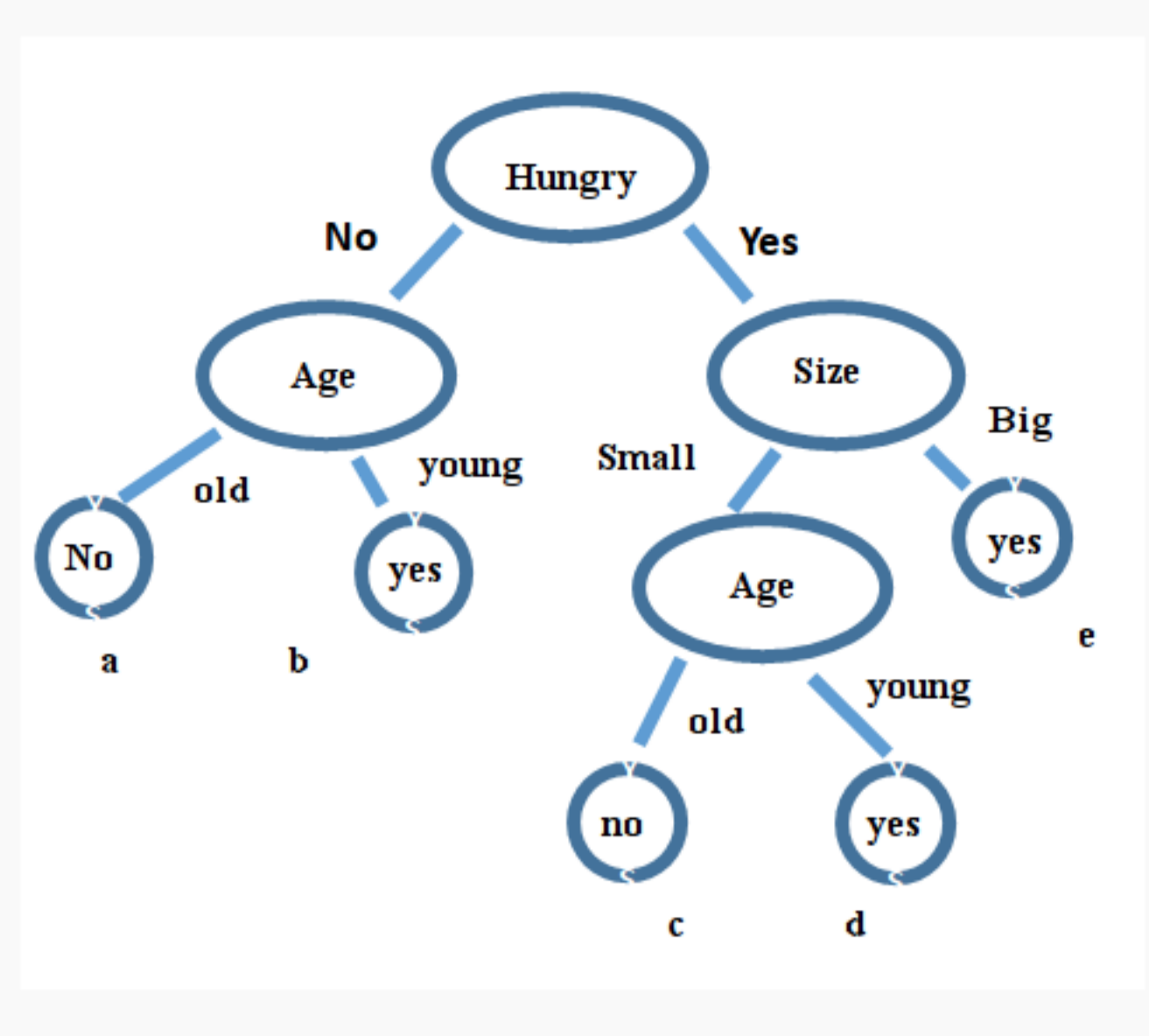
The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2020-03-18, 23:59 IST.

1)

2 points

sex	age	size	hungry	Eat much
man	young	big	yes	yes
woman	young	big	yes	yes
man	old	big	yes	yes
woman	old	big	yes	yes
man	young	small	yes	yes
woman	young	small	yes	yes
man	old	small	yes	no
woman	old	small	yes	no
man	old	big	no	no
woman	old	big	no	no
man	young	big	no	yes
woman	young	big	no	yes
man	old	small	no	no
woman	young	small	no	yes
woman	old	small	no	no
man	young	small	no	yes



How are the 16 data items in the provided dataset distributed on the leaves of the decision tree above?

a=2 b=4 c=6 d=4 e=2
 a=4 b=2 c=4 d=4 e=2
 a=4 b=4 c=2 d=2 e=4

No, the answer is incorrect. Score: 0
 Accepted Answers: a=4 b=4 c=2 d=2 e=4

2) What is the term for the kind of probabilities occurring in the probability tables associated with each node in a Bayesian Network?

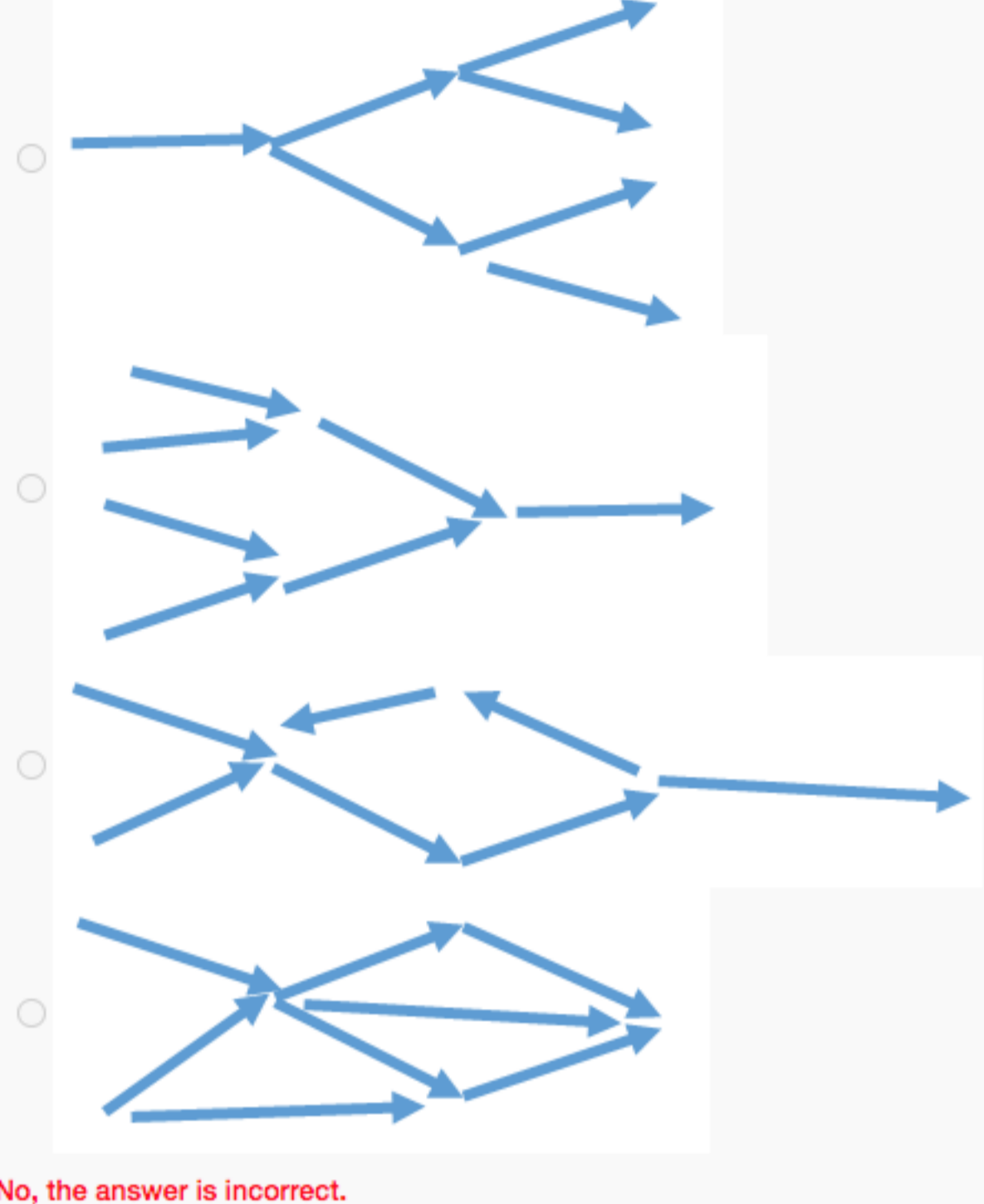
1 point

- Apriori probability
- Conditional probability
- A posteriori probability
- Joint probability

No, the answer is incorrect. Score: 0
 Accepted Answers: Conditional probability

3) Which of the following network structures cannot be the base for a Bayesian Network?

2 points



No, the answer is incorrect. Score: 0
 Accepted Answers: [The cyclic structure]

4) A version of bayes rule: $P(\text{cause}|\text{effect}) = P(\text{effect}|\text{cause}) * P(\text{cause})/P(\text{effect})$

2 points

In this example
 effect = the state of a patient having red dots on the skin
 cause = the state of a patient having rubella
 Prior probabilities: $P(\text{cause}) = 1/1000$, $P(\text{effect}) = 1/100$.

$P(\text{effect}|\text{cause}) = 0.9$

What is the value of $P(\text{cause}|\text{effect})$

- 0.9
- 0.09
- 0.009

No, the answer is incorrect. Score: 0
 Accepted Answers: 0.09

5) Which is the normal sequence of steps in Genetic Algorithms?

0 points

- Generation, Evaluation, Selection, Reproduction, Mutation
- Generation, Selection, Evaluation, Reproduction, Mutation
- Generation, Mutation, Evaluation, Selection, Reproduction
- Generation, Reproduction, Evaluation, Selection, Mutation

No, the answer is incorrect. Score: 0
 Accepted Answers: Generation, Selection, Evaluation, Reproduction, Mutation

6) Two chromosomes

1 point

A 11110000
 B 00001111

A two point crossover operation in-between positions 2 and 7 should be performed to give two new chromosomes. Which constellation is the crossover result?

- 11001100
00110011
- 00001111
11110000
- 00110011
11001100

No, the answer is incorrect. Score: 0
 Accepted Answers: 11001100
00110011

7) Which is the normal sequence of phases in a Classifier system based on Genetic Algorithms?

1 point

- Genetic algorithm learning phase, Rule application phase, Bucket Brigade phase
- Genetic algorithm learning phase, Bucket Brigade phase, Rule application phase
- Bucket Brigade phase, Genetic algorithm learning phase, Rule application phase
- Bucket Brigade phase, Rule application phase, Genetic algorithm learning phase
- Rule application phase, Bucket Brigade phase, Genetic algorithm learning phase
- Rule application phase, Genetic algorithm learning phase, Bucket Brigade phase

No, the answer is incorrect. Score: 0
 Accepted Answers: Rule application phase, Bucket Brigade phase, Genetic algorithm learning phase

8) Which researcher is known for having made the first implementation of an artificial neural network in 1956?

1 point

- JOHN HOLLAND
- MARVIN MINSKY
- IRWIN SHAW

No, the answer is incorrect. Score: 0
 Accepted Answers: MARVIN MINSKY

9) What is the term for the Output from a real Neuron in the context of the human brain?

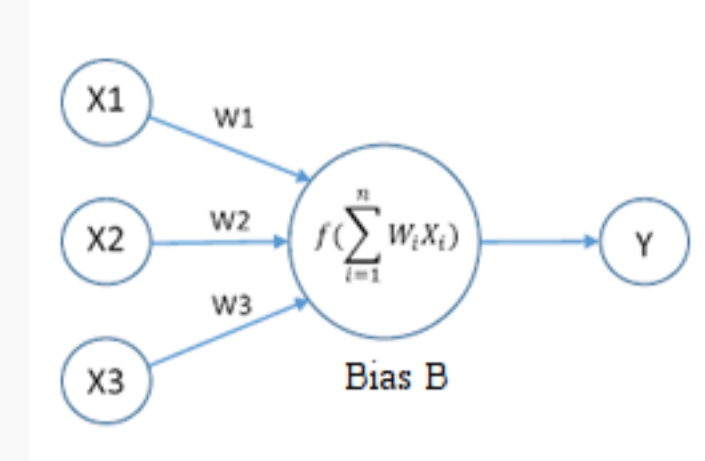
1 point

- SOMA
- DENDRITE
- AXON
- SYNAPSE

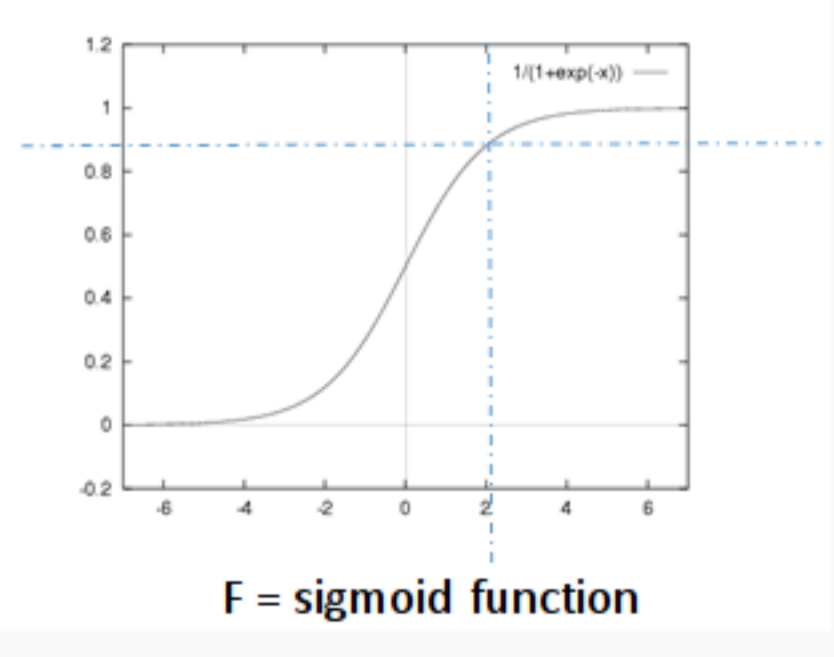
No, the answer is incorrect. Score: 0
 Accepted Answers: AXON

10)

2 points



$X1 = 5 \quad X2 = 5 \quad X3 = 3$
 $W1 = 0.8 \quad W2 = 0.3 \quad W3 = 0.5$
 $B = -5$
 $Y = f(\text{Sum } w_i * x_i + B)$



What is the output value Y for the above artificial neuron?

0.5
 0.9
 1.2

No, the answer is incorrect. Score: 0
 Accepted Answers: 0.9

11) Which is the basic inference rule in Logic Programming?

1 point

- SDD resolution
- SDL resolution
- SLD resolution

No, the answer is incorrect. Score: 0
 Accepted Answers: SLD resolution

12) The member operation for lists is implemented in a recursive Prolog program. The notation $[X|Y]$ means that X is the head of a list and Y is the Tail

2 points

Which is the correct member Prolog Program?

- member([,], []).
member(X,[Y|R]) :- member(X,R).
- member(X,X).
member(X,[Y|R]) :- member(X,R).
- member(X,[Y|X]).
member(X,[R|Y]) :- member(X,R).
- member(X,[X|R]).
member(X,[Y|R]) :- member(X,R).

No, the answer is incorrect. Score: 0
 Accepted Answers: member(X,[X|R]).
member(X,[Y|R]) :- member(X,R).