# Pattern Recognition

## Multiple Choice Questions and Answers :-

1. Which algorithm is used for solving temporal probabilistic reasoning?

a) Hill-climbing search

b) Hidden markov model

c) Depth-first search

d) Breadth-first search

Answer:b

Explanation:Hidden Markov model is used for solving temporal probabilistic reasoning that was independant of transition and sensor model.

2. How does the state of the process is described in HMM?

a) Literal

b) Single random variable

c) Single discrete random variable

d) None of the mentioned

Answer:c

Explanation:An HMM is a temporal probabilistic model in which the state of the process is described by a single discrete random variable.

3. What are the possible values of the variable?

a) Variables

b) Literals

c) Discrete variable

d) Possible states of the world

Answer:d

Explanation:The possible values of the variables are the possible states of the world.

4. Where does the additional variables are added in HMM?

a) Temporal model

b) Reality moddel

c) Probability model

d) All of the mentioned

Answer:a

Explanation:Additional state variables can be added to a temporal model while staying within the HMM framework.

5. Which allows for a simple and matrix implementation of all the basic algorithm?

a) HMM

b) Restricted structure of HMM

c) Temporary model

d) Reality model

Answer:b

Explanation:Restricted structure of HMM allows for a very simple and elegant matrix implementation of all the basic algorithm.

6. Where does the Hidden Markov Model is used?

a) Speech recognition

b) Understanding of real world

c) Both a & b

d) None of the mentioned

Answer:a

7. Which variable can give the concrete form to the representation of the transition model?

a) Single variable

b) Discrete state variable

c) Random variable

d) Both a & b

Answer:d

Explanation:With a single, discrete state variable, we can give concrete form to the representationof the transition model.

8. Which algorithm works by first running the standard forward pass to compute?

a) Smoothing

b) Modified smoothing

c) HMM

d) Depth-first search algorithm

Answer:b

Explanation:The modified smoothing algorithm works by first running the standard forward pass to compute and then running the backward pass.

9. Which reveals an improvement in online smoothing?

a) Matrix formulation

b) Revelation

c) HMM

d) None of the mentioned

Answer:a

Explanation:Matirx formulation reveals an improvement in online smoothing with a fixed lag.

10. Which suggests the existence of efficient recursive algorithm for online smoothing?

a) Matrix

b) Constant space

c) Constant time

d) None of the mentioned

Answer:b

11. Which data structure is used to give better heuristic estimates?

a) Forwards state-space

b) Backward state-space

c) Planning graph algorithm

d) None of the mentioned

Answer: c

Explanation: A special data structure called planning graph is used to give better heuristic estimates.

12. Which is used to extract solution directly from the planning graph?

a) Planning algorithm

b) Graph plan

c) Hill-climbing search

d) All of the mentioned

Answer: b

Explanation: We can extract the solution directly from the planning graph, using a specialized algorithm called Graph plan.

13. What are present in the planning graph?

a) Sequence of levels

b) Literals

c) Variables

d) Heuristic estimates

Answer: a

Explanation: A planning graph consists of sequence of levels correspond to time steps.

14. What is the starting level of planning graph?

a) Level 3

b) Level 2

c) Level 1

d) Level 0

Answer: d

15. What are present in each level of planning graph?

a) Literals

b) Actions

c) Variables

d) Both a & b

Answer: d

Explanation: Each level in the planning graph contains a set of literals and a set of actions.

16. Which kind of problem is suitable for planning graph?

a) Propositional planning problem

b) Planning problem

c) Action problem

d) None of the mentioned

Answer: a

Explanation: Planning graph work only for propositional planning problem with no variables.

17. What is meant by persistence actions?

a) Allow a literal to remain false

b) Allow a literal to remain true

c) Both a & b

d) None of the mentioned

Answer: b

Explanation: Calculus allows a literal to remain true from one situation to the next if no action alters it. It is called as persistence action.

18. When will further expansion is unnecessary for planning graph?

a) Identical

b) Replicate

c) Not identical

d) None of the mentioned

Answer: a

Explanation: Every subsequent level will be identical, So further expansion is unnecessary.

19. How many conditions are available between two actions in mutex relation?

a) 1

b) 2

c) 3

d) 4

Answer: c

Explanation: The three conditions available on mute relationship are inconsistent effects,

interference and competing needs.

20. What is called inconsistent support?

a) If two literals are not negation of other

b) If two literals are negation of other

c) Mutually exclusive

d) None of the mentioned

Answer: b

Explanation: If two literals are at the same level if one is the negation of another is called

inconsistent support.

21. Which algorithm is used for solving temporal probabilistic reasoning?

a) Hill-climbing search

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24. Where does the additional variable is added in HMM?

a) Temporal model

b) Reality model

c) Probability model

d) All of the mentioned

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Explanation: Additional state variables can be added to a temporal model while staying within the HMM framework.

25. Which allows for a simple and matrix implementation of the entire basic algorithm?

a) HMM

b) Restricted structure of HMM

c) Temporary model

d) Reality model

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Explanation: Restricted structure of HMM allows for a very simple and elegant matrix implementation of the entire basic algorithm.

26. Where does the Hidden Markov Model is used?

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Explanation: With a single, discrete state variable, we can give concrete form to the representation of the transition model.

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29. Which reveals an improvement in online smoothing?

a) Matrix formulation

b) Revelation

c) HMM

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Answer: a

Explanation: Matrix formulation reveals an improvement in online smoothing with a fixed lag.

30. Which suggests the existence of efficient recursive algorithm for online smoothing?

a) Matrix

b) Constant space

c) Constant time

d) None of the mentioned

Answer: b

31. Which condition is used to cease the growth of forward chaining?

a) Atomic sentences

b)Complex sentences

c) No further inference

d) All of the mentioned

Answer: c

Explanation: Forward chain can grow by adding new atomic sentences until no further inference is made.

32. Which closely resembles propositional definite clause?

a) Resolution

b) Inference

c) Conjunction

d) First-order definite clauses

Answer: d

Explanation: Because they are disjunction of literals, of which exactly one is positive.

33. What is the condition of variables in first-order literals?

a) Existentially quantified

b) Universally quantified

c) Both a & b

d) None of the mentioned

View Answer

Answer: b

Explanation: First-order literals will accept variables only if they are universally quantified.

34. Which is more suitable normal form to be used with definite clause?

a) Positive literal

b) Negative literal

c) Generalized modus ponens

d) Neutral literal

Answer: c

Explanation: Definite clauses are a suitable normal form for use with generalized modus ponen.

35. Which will be the instance of the class data log knowledge bases?

a) Variables

b) No function symbols

c) First-order definite clauses

d) None of the mentioned

Answer: b

Explanation: If the knowledge base contains no function symbols means, it is an instance of the class

data log knowledge base.

36. Which knowledge base is called as fixed point?

a) First-order definite clause is similar to propositional forward chaining

b) First-order definite clause is mismatch to propositional forward chaining

c) Both a & b

d) None of the mentioned

View Answer

Answer: a

Explanation: Fixed point reached by forward chaining with first-order definite clause are similar to those for propositional forward chaining.

37. How to eliminate the redundant rule matching attempts in the forward chaining?

a) Decremental forward chaining

b) Incremental forward chaining

c) Data complexity

d) None of the mentioned

Answer: b

Explanation: We can eliminate the redundant rule matching attempts in the forward chaining by using incremental forward chaining.

38. From where did the new fact inferred on new iteration is derived?

a) Old fact

b) Narrow fact

c) New fact

d) All of the mentioned

Answer: c

39. Which will solve the conjuncts of the rule so that the total cost is minimized?

a) Constraint variable

b) Conjunct ordering

c) Data complexity

d) All of the mentioned

Answer: b

Explanation: Conjunct ordering will find an ordering to solve the conjuncts of the rule premise so that the total cost is minimized.

40. How many possible sources of complexity are there in forward chaining?

a) 1

b) 2

c) 3

d) 4

Answer: c

Explanation: The three possible sources of complexity are inner loop, algorithm rechecks every rule on every iteration, and algorithm might generate many facts irrelevant to the goal.

41. Which algorithm will work backward from the goal to solve a problem?

a) Forward chaining

b) Backward chaining

c) Hill-climb algorithm

d) None of the mentioned

Answer: b

Explanation: Backward chaining algorithm will work backward from the goal and it will chain the known facts that support the proof.

42. Which is mainly used for automated reasoning?

a) Backward chaining

b) Forward chaining

c) Logic programming

d) Parallel programming

Answer: c

Explanation: Logic programming is mainly used to check the working process of the system.

43. What will backward chaining algorithm will return?

a) Additional statements

b) Substitutes matching the query

c) Logical statement

d) All of the mentioned

Answer: b

Explanation: It will contain the list of goals containing a single element and returns the set of all substitutions satisfying the query.

44. How can be the goal is thought of in backward chaining algorithm?

a) Queue

b) List

c) Vector

d) Stack

Answer: d

Explanation: The goals can be thought of as stack and if all of them us satisfied means, then current branch of proof succeeds.

45. What are used in backward chaining algorithm?

a) Conjuncts

b) Substitution

c) Composition of substitution

d) None of the mentioned

View Answer

Answer: c

Explanation: None.

46. Which algorithm is in more similar to backward chaining algorithm?

a) Depth-first search algorithm

b) Breadth-first search algorithm

c) Hill-climbing search algorithm

d) All of the mentioned

Answer: a

Explanation: It is depth-first search algorithm because its space requirements are linear in the size

of the proof.

47. Which problem can frequently occur in backward chaining algorithm?

a) Repeated states

b) Incompleteness

c) Complexity

d) Both a & b

Answer: d

Explanation: If there is any loop in the chain means, It will lead to incompleteness and repeated

states.

48. How the logic programming can be constructed?

a) Variables

b) Expressing knowledge in a formal language

c) Graph

d) All of the mentioned

Answer: b

Explanation: Logic programming can be constructed by expressing knowledge in a formal expression and

the problem can be solved by running inference process.

49. What form of negation does the prolog allows?

a) Negation as failure

b) Proposition

c) Substitution

d) Negation as success

Answer: a

50. Which is omitted in prolog unification algorithm?

a) Variable check

b) Occur check

c) Proposition check

d) Both b & c

Answer: b

Explanation: Occur check is omitted in prolog unification algorithm because of unsound inferences.

51. The process by which the brain incrementally orders actions needed to complete a specific task is referred as,

a) Planning problem

b) Partial order planning

c) Total order planning

d) Both a & b

Answer: b

Explanation: Definition of partial order planning.

52. To complete any task, the brain needs to plan out the sequence by which to execute the behavior.

One way the brain does this is with a partial-order plan. State whether true or false.

a) True

b) False

Answer: a

53. In partial order plan,

a. Relationships between the actions of the behavior are set prior to the actions

b. Relationships between the actions of the behavior are not set until absolutely necessary

Choose the correct option.

a) a. is true

b) b. is true

c) Either a. or b. can be true depending upon situation

d) Neither a. nor b. is true

Answer: a

Explanation: Relationship between behavior and actions is established dynamically.

54. Which of the following search belongs to totally ordered plan search?

a) Forward state-space search

b) Hill-climbing search

c) Depth-first search

d) Breadth-first search

Answer: a

Explanation: Forward and backward state-space search are particular forms of totally ordered plan search.

55. Which cannot be taken as advantage for totally ordered plan search?

a) Composition

b) State search

c) Problem decomposition

d) None of the mentioned

Answer: c

Explanation: As the search explore only linear sequences of actions, So they cannot take the advantage of problem decomposition.

56. What is the advantage of totally ordered plan in constructing the plan?

a) Reliability

b) Flexibility

c) Easy to use

d) All of the mentioned

Answer: b

Explanation: Totally ordered plan has the advantage of flexibility in the order in which it constructs the plan.

57. Which strategy is used for delaying a choice during search?

a) First commitment

b) Least commitment

c) Both a & b

d) None of the mentioned

Answer: b

Explanation: The general strategy of delaying a choice during search is called a least commitment strategy.

58. Which algorithm place two actions into a plan without specifying which should come first?

a) Full-order planner

b) Total-order planner

c) Semi-order planner

d) Partial-order planner

Answer: d

Explanation: Any planning algorithm that can place two actions into a plan without specifying which should come first is called partial-order planner.

59. How many possible plans are available in partial-order solution?

a) 3

b) 4

c) 5

d) 6

Answer: d

Explanation: The partial-order solution corresponds to six possible total-order plans.

60. What is the other name of each and every total-order plans?

a) Polarization

b) Linearization

c) Solarization

d) None of the mentioned

Answer: b

Explanation: Each and every total order plan is also called as linearization of the partial-order plan.

61. Which provides agents with information about the world they inhabit?

a) Sense

b) Perception

c) Reading

d) Hearing

Answer: b

Explanation: Perception provides agents with information about the world they inhabit.

62. What is used to initiate the perception in the environment?

a) Sensor

b) Read

c) Actuators

d) None of the mentioned

Answer: a

Explanation: A sensor is anything that can record some aspect of the environment.

63. What is the study of light?

a) Biology

b) Light logy

c) Photometry

d) All of the mentioned

Answer: c

64. How to increase the brightness of the pixel?

a) Sound

b) Amount of light

c) Surface

d) Waves

Answer: b

Explanation: The brightness of a pixel in the image is proportional to the amount of light directed towards the camera.

65. How many kinds of reflection are available in image perception?

a) 1

b) 2

c) 3

d) 4

Answer: b

Explanation: There are two kinds of reflection. They are specular and diffuse reflection.

66. What is meant by predicting the value of a state variable from the past?

a) Specular reflection

b) Diffuse reflection

c) Gaussian filter

d) Smoothing

Answer: d

Explanation: Smoothing meant predicting the value of a state variable from the past and by given evidence and calculating the present and future.

67. How many types of image processing techniques are there in image perception?

a) 1

b) 2

c) 3

d) 4

Answer: c

Explanation: The three image processing techniques are smoothing, edge detection and image segmentation.

68. Which is meant by assuming any two neighboring that are both edge pixels with consistent orientation?

a) Canny edge detection

b) Smoothing

c) Segmentation

d) None of the mentioned

Answer: a

Explanation: Canny edge detection is assuming any two neighboring that are both edge pixels with consistent orientation belong to the same edge.

69. What is the process of breaking an image into groups?

a) Edge detection

b) Smoothing

c) Segmentation

d) None of the mentioned

Answer: c

Explanation: Segmentation is the process of breaking an image into groups, based on the similarities of the pixels.

70. How many types of 3-D image processing techniques are there in image perception?

a) 3

b) 4

c) 5

d) 6

Answer: c

Explanation: The five types of 3-D image processing techniques are motion, binocular stereopsis, texture, shading and contour.

71. Fuzzy logic is a form of

a) Two-valued logic

b) Crisp set logic

c) Many-valued logic

d) Binary set logic

Answer: c

Explanation: With fuzzy logic set membership is defined by certain value. Hence it could have many values to be in the set.

72. Traditional set theory is also known as Crisp Set theory.

a) True

b) False

Answer: a

Explanation: Traditional set theory set membership is fixed or exact either the member is in the set or not. There is only two crisp values true or false. In case of fuzzy logic there are many values. With weight say x the member is in the set.

73. The truth values of traditional set theory is _____ and that of fuzzy set is _____

a) Either 0 or 1, between 0 & 1

b) Between 0 & 1, either 0 or 1

c) Between 0 & 1, between 0 & 1

d) Either 0 or 1, either 0 or 1

Answer: a

Explanation: Refer the definition of Fuzzy set and Crisp set.

74. Fuzzy logic is extension of Crisp set with an extension of handling the concept of Partial Truth.

a) True

b) False

Answer: a

85. How many types of random variables are available?

a) 1

b) 2

c) 3

d) 4

Answer: c

Explanation: The three types of random variables are Boolean, discrete and continuous.

76. The room temperature is hot. Here the hot (use of linguistic variable is used) can be represented by _____ .

a) Fuzzy Set

b) Crisp Set

Answer: a

Explanation: Fuzzy logic deals with linguistic variables.

77. The values of the set membership is represented by

a) Discrete Set

b) Degree of truth

c) Probabilities

d) Both b & c

Answer: b

Explanation: Both Probabilities and degree of truth ranges between 0 – 1.

78. What is meant by probability density function?

a) Probability distributions

b) Continuous variable

c) Discrete variable

d) Probability distributions for Continuous variables

Answer: d

79. Japanese were the first to utilize fuzzy logic practically on high-speed trains in Sendai.

a) True

b) False

View Answer

Answer: a

Explanation: None.

80. Which of the following is used for probability theory sentences?

a) Conditional logic

b) Logic

c) Extension of propositional logic

d) None of the mentioned

Answer: c

Explanation: The version of probability theory we present uses an extension of propositional logic for its sentences.

81. A Term is either an individual constant (a 0-ary function), or a variable, or an n-ary function applied to n terms: F(t1 t2 ..tn).

a) True

b) False

Answer: a

Explanation: Definition of term in FOL.

82. Which are needed to compute the logical inference algorithm?

a) Logical equivalence

b) Validity

c) Satisfiability

d) All of the mentioned

Answer: d

Explanation: Logical inference algorithm can be solved be using logical equivalence, Validity and satisfiability.

83. From which rule does the modus ponens are derived?

a) Inference rule

b) Module rule

c) Both a & b

d) None of the mentioned

Answer: a

Explanation: Inference rule contains the standard pattern that leads to desired goal. The best form of inference rule is modus ponens.

84. Which is also called single inference rule?

a) Reference

b) Resolution

c) Reform

d) None of the mentioned

Answer: b

Explanation: Because resolution yields a complete inference rule when coupled with any search algorithm.

85. Which form is called as conjunction of disjunction of literals?

a) Conjunctive normal form

b) Disjunctive normal form

c) Normal form

d) All of the mentioned

Answer: a

86. First Order Logic is also known as,

a) First Order Predicate Calculus

b) Quantification Theory

c) Lower Order Calculus

d) All of the mentioned above

Answer: d

87. The adjective “first-order” distinguishes first-order logic from _____ in which there are

predicates having predicates or functions as arguments, or in which one or both of predicate

quantifiers or function quantifiers are permitted.

a) Representational Verification

b) Representational Adequacy

c) Higher Order Logic

d) Inferential Efficiency

Answer: c

88. Which is not Familiar Connectives in First Order Logic?

a) and

b) iff

c) or

d) not

Answer: d

Explanation: “not” is coming under propositional logic and is therefore not a connective.

89. Inference algorithm is complete only if,

a) It can derive any sentence

b) It can derive any sentence that is an entailed version

c) It is truth preserving

d) Both b & c

Answer: d

90. An inference algorithm that derives only entailed sentences is called sound or truth-preserving.

a) True

b) False

Answer: a