PR - LEC 2 QUESTION BANK

Helping Others Have Special taste

Questions

1. What is the primary goal of pattern recognition?
A) Identifying and classifying patterns
B) Modifying existing patterns
C) Randomly assigning labels to patterns
D) Ignoring patterns

2. What is used to determine if two circular arcs belong to the same circle?
A) Length of the arcs
B) Radius and center location
C) Color of the arcs
D) Arc angle only

3. What is a major challenge in pattern recognition?
A) Over-simplification
B) Feature extraction
C) Lack of computational power
D) Ignoring data

4. In circular arc recognition, how is the center identified?
A) By estimating its position manually
B) By intersecting perpendiculars at different points
C) By measuring the arc's height
D) By counting the number of arcs

5. What can cause a circular arc to appear discontinuous?
A) Poor lighting
B) Weak magnetic fields
C) Incorrect color mapping
D) Occlusion by other objects

6. Which type of learning requires labeled data?
A) Supervised learning
B) Unsupervised learning
C) Reinforcement learning
D) Self-organizing maps

7. What is a feature vector in pattern recognition?
A) A set of random values
B) A sequence of symbols
C) A mathematical representation of extracted features
D) A list of unrelated numbers

8. Why are similarity measures important in machine learning?
A) To identify relationships between feature vectors
B) To store data
C) To delete unnecessary features
D) To increase computational complexity

9. Which of the following is a problem in feature extraction?
A) Selecting features that do not capture unique properties
B) Having too many feature vectors
C) Using too much memory
D) Extracting only numerical values

10. Which feature is sufficient to classify circular arcs?
A) Color and shape
B) Radius and center
C) Edge sharpness
D) Orientation

11. How does unsupervised learning differ from supervised learning?
A) It does not require labeled data
B) It performs worse in real applications
C) It is the same as reinforcement learning
D) It requires more training time

12. What is one advantage of supervised learning?
A) It can work without labeled data
B) It provides explicit class labels
C) It requires no feature extraction
D) It does not need training

13. Why is the reverse mapping from a feature vector to a pattern challenging?
A) Feature vectors are always unique
B) Multiple patterns can have the same feature vector
C) It is computationally simple
D) Patterns are always distinct

14. Which problem occurs due to errors in pattern segmentation?
A) Incomplete or inaccurate feature extraction
B) Overfitting in machine learning models
C) Over-segmentation of patterns
D) Feature compression issues

15. What is the purpose of a similarity measure in pattern recognition?
A) To assign random labels
B) To reduce computational speed
C) To increase dataset complexity
D) To compare feature vectors and determine similarity

16. What is the primary goal of feature extraction?
A) Reducing the dataset size
B) Increasing computational complexity
C) Removing outliers
D) Identifying relevant characteristics for classification

17. Which approach helps in handling segmentation errors in pattern recognition?
A) Randomized feature selection
B) Robust feature extraction
C) Avoiding feature engineering
D) Ignoring missing data

18. What are chain codes used for?
A) Image classification
B) Speech recognition
C) Boundary representation of shapes
D) Feature normalization

19. What is a limitation of standard chain codes?
A) They require labeled data
B) They depend on the starting point
C) They can only represent simple shapes
D) They ignore feature vectors

20. What is the main advantage of differential chain codes?
A) They are completely noise-free
B) They provide rotation invariance
C) They work only for circular shapes
D) They are independent of connectivity schemes

21. How does unsupervised learning partition data?
A) Using predefined labels
B) By random assignment
C) Using a manually labeled dataset
D) Based on feature vector similarities

22. What problem does chain code compression address?
A) Storage efficiency
B) Shape recognition errors
C) Feature selection
D) Learning rates

23. What is an application of chain codes?
A) Robot navigation
B) Data encryption
C) Feature fusion
D) Feature extraction in textual data

24. What is a key difference between pattern recognition and machine learning?
A) Pattern recognition does not use features
B) Machine learning focuses on optimization
C) Pattern recognition is more computationally expensive
D) Machine learning does not rely on features

25. What is a common issue with measuring similarity between patterns?
A) Uniqueness of feature vectors
B) Noise and errors in measurement
C) Excessive computation time
D) Overfitting in all cases

26. Suppose you have two circular arcs with centers (3,5) and (3.1, 5.2). If their radii are 10 and 9.95, can they be part of the same circle?
A) Yes
B) No
C) Only if they have the same angle
D) Not enough information

27. A shape boundary is represented using an 8-connectivity chain code. If it is rotated by 90 degrees clockwise, how will the chain code change?
A) Each value increases by 2 modulo 8
B) It remains the same
C) Each value decreases by 2 modulo 8
D) The chain code becomes meaningless

28. In an unsupervised learning algorithm, how can you determine the optimal number of clusters?
A) By manually labeling clusters
B) By setting a fixed number
C) Using the Elbow Method
D) Using only hierarchical clustering

29. What is the best way to improve a pattern recognition system handling occluded shapes?
A) Ignore occluded data
B) Increase dataset size only
C) Use multimodal approaches
D) Reduce feature vectors

30. What is the best method to handle rotational variance in shape recognition?
A) Ignoring rotated shapes
B) Increasing dataset size
C) Applying more convolution layers
D) Differential chain codes

31. What is the role of feature vectors in pattern recognition?
A) They store raw image data
B) They encode essential pattern characteristics
C) They eliminate noise in data preprocessing
D) They classify data directly

32. Which method improves the robustness of a pattern recognition system?
A) Using redundant features
B) Employing adaptive learning algorithms
C) Ignoring errors in segmentation
D) Reducing the number of training samples

33. In supervised learning, how does a model learn?
A) By grouping similar patterns without prior labels
B) By discarding irrelevant features
C) By mapping input patterns to labeled outputs
D) By clustering similar features

34. Which of the following is a challenge in feature selection?
A) Selecting features that generalize well
B) Using a small dataset
C) Eliminating all noise from the data
D) Avoiding the use of numerical data

35. How do multimodal approaches improve pattern recognition?
A) They introduce redundancy
B) They remove the need for training data
C) They simplify feature extraction
D) They combine multiple sources of information

36. What is one major issue with segmentation errors in pattern recognition?
A) It can introduce quantization noise
B) It always improves accuracy
C) It eliminates variability in features
D) It makes feature extraction easier

37. How can similarity measures be computed?
A) Using Euclidean or Mahalanobis distance
B) By summing the feature values
C) By randomly assigning distances
D) Using only binary classification

38. Why is feature extraction important in pattern recognition?
A) It reduces computation time
B) It avoids the use of machine learning
C) It directly classifies data
D) It eliminates noise completely

39. What is the main advantage of unsupervised learning in pattern recognition?
A) It requires labeled training data
B) It discovers hidden patterns without labels
C) It is easier to implement
D) It does not require feature extraction

40. Which factor can make pattern recognition more challenging?
A) Over-simplified feature vectors
B) A large amount of data
C) A perfectly labeled dataset
D) Noisy or incomplete data

41. A feature vector for a shape consists of (radius, number of edges). Which classifier is best for this dataset?
A) k-Nearest Neighbors
B) Naive Bayes
C) Random search
D) Any model without training

42. If an image is rotated by 180 degrees, how does its differential chain code change?
A) Each value increases by 1
B) It remains unchanged
C) It reverses direction
D) It becomes invalid

43. A robot navigates an environment using chain codes for obstacle detection. Which type of chain code is best for rotation-invariant recognition?
A) Fixed-length chain code
B) Absolute chain code
C) Differential chain code
D) Randomized chain code

44. Which factor affects the accuracy of feature extraction in pattern recognition?
A) Measurement errors
B) Number of patterns
C) Existence of perfect features
D) Number of training epochs

45. If a circular arc is occluded, how can its original circle be identified?
A) By estimating its center and radius
B) By extending the arc manually
C) By guessing its original shape
D) By ignoring occlusion

46. What is the main advantage of using feature vectors in machine learning?
A) They eliminate the need for training
B) They remove all errors
C) They work only for small datasets
D) They reduce dimensionality and improve classification

47. A shape has a feature vector (10, 5, 2). Another has (10.1, 5.1, 2.1). Which similarity measure is best?
A) Absolute difference
B) Random similarity
C) Cosine similarity
D) Euclidean distance

48. What is an effective method to handle missing data in pattern recognition?
A) Using imputation techniques
B) Ignoring missing values
C) Removing entire feature vectors
D) Duplicating missing values

49. Which property makes chain codes efficient for shape representation?
A) They are error-free
B) They provide compact encodin
C) They require no training
D) They ignore rotation

50. How can rotation invariance be introduced in pattern recognition?
A) By increasing training data size
B) By using differential features
C) By ignoring rotated patterns
D) By reducing feature complexity

51. A machine learning model has poor generalization in pattern recognition. What is a likely cause?
A) Low feature extraction quality
B) High training accuracy
C) Overfitting
D) Ignoring noise

52. If an 8-connectivity chain code is modified for curved segments, what is its advantage?
A) Better shape approximation
B) Increased complexity
C) No need for feature vectors
D) It cannot represent circles

53. What is a disadvantage of absolute chain codes?
A) They do not work for simple shapes
B) They require high memory
C) They cannot store feature vectors
D) They are not rotation-invariant

54. How does feature selection affect classification accuracy?
A) It increases model complexity
B) It reduces data noise
C) It removes irrelevant features
D) It does not affect classification

55. A dataset with patterns (x, y) is clustered. What method helps determine the best number of clusters?
A) Elbow Method
B) Random clustering
C) Fixed-size clusters
D) Label-based clustering

56. What issue can arise if a pattern recognition model is too complex?
A) It may generalize well
B) It may overfit to training data
C) It will always perform better
D) It removes segmentation errors

57. In which application is pattern recognition most commonly used?
A) Network security only
B) Random number generation
C) Simple text storage
D) Face recognition

58. How does increasing the number of features affect pattern classification?
A) It always improves accuracy
B) It may introduce noise and redundancy
C) It has no impact
D) It removes occlusion errors

59. If two feature vectors have identical values, what can be concluded?
A) One feature vector is incorrect
B) They must be different
C) The patterns are likely similar
D) The similarity measure is incorrect

60. A recognition system has errors due to measurement variations. What technique can reduce errors?
A) Removing feature vectors with errors
B) Ignoring variations
C) Reducing dataset size
D) Using robust feature extraction

Answers

Question	Answer
1	A
2	B
3	B
4	B
5	D
6	A
7	C
8	A
9	A
10	B
11	A
12	B
13	B
14	A
15	D
16	D
17	B
18	C
19	B
20	B
21	D
22	A
23	A
24	B
25	B
26	A
27	A
28	C

29	C
30	D
31	B
32	B
33	C
34	A
35	D
36	A
37	A
38	A
39	B
40	D
41	A
42	C
43	C
44	A
45	A
46	D
47	D
48	A
49	B
50	B
51	C
52	A
53	D
54	C
55	A
56	B
57	D
58	B
59	C
60	D

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