

Multimedia Question

1. What is the primary purpose of using a histogram?
 - a) To display textual data.
 - b) To represent the distribution of statistical data.
 - c) To analyze relationships between variables.
 - d) To display time-series data.

a. Correct Answer: b)

2. What does the area in a histogram represent?
 - a) The number of classes.
 - b) The frequency of data in each class.
 - c) The mean of the data.
 - d) The standard deviation.

a. Correct Answer: b)

3. If the bars in a histogram are of equal width, what does the height of the bar indicate?
 - a) The range of the data.
 - b) The frequency of the class.
 - c) The mean of the data.
 - d) The standard deviation.

a. Correct Answer: b)

4. In which field is a histogram commonly used for image quality enhancement?
 - a) Financial analysis.
 - b) Digital image processing.
 - c) Textual data analysis.
 - d) Time-series data analysis.

a. Correct Answer: b)

5. How can a histogram help in statistical data analysis?
 - a) By providing a visual representation of data distribution.
 - b) By identifying the relationship between two variables.
 - c) By calculating the mean of the data.
 - d) By analyzing textual data.

a. Correct Answer: a)
6. What is the effect of increasing the number of classes in a histogram?
 - a) The histogram becomes smoother.
 - b) The histogram becomes more detailed.
 - c) The histogram becomes less clear.
 - d) The histogram becomes more skewed.

a. Correct Answer: b)

7. What is the purpose of applying smoothing to a histogram?
 - a) To increase the number of classes.
 - b) To reduce noise in the data.
 - c) To increase data skewness.
 - d) To improve the clarity of textual data.

a. Correct Answer: b)

8. What happens if the classes in a histogram are not of equal width?
 - a) The histogram becomes inaccurate.
 - b) The bar heights must be adjusted to reflect density.
 - c) The histogram becomes more detailed.
 - d) The histogram becomes symmetrical.

a. Correct Answer: b)

9. What is a cumulative histogram?
 - a) A histogram that displays the cumulative frequency of classes.
 - b) A histogram that displays the individual frequency of classes.

Multimedia Question

- c) A histogram that displays textual data.
- d) A histogram that displays time-series data.

a. Correct Answer: a)

10. What is a weighted histogram?

- a) A histogram that assigns different weights to data points.
- b) A histogram that displays data without weights.
- c) A histogram that displays textual data.
- d) A histogram that displays time-series data.

a. Correct Answer: a)

11. What is a multivariate histogram?

- a) A histogram that displays the distribution of more than one variable.
- b) A histogram that displays the distribution of one variable.
- c) A histogram that displays textual data.
- d) A histogram that displays time-series data.

a. Correct Answer: a)

12. Given the histogram counts $h_i = [2, 5, 9, 12, 10, 6, 4, 2]$ for gray levels 0 to 7, what is the cumulative frequency C_3 ?

- a) 16
- b) 28
- c) 38
- d) 44

a. Correct Answer: b)

13. If the total number of pixels in an image is 50 and you want to select a threshold such that 90% of

the pixels are below the threshold, what is the appropriate gray level? ($C_5=44$ $C_6=48$)

- a) 5
- b) 6
- c) 7
- d) 4

Correct Answer: b).

14. What does the cumulative frequency distribution represent in an image?

- a) The frequency of each gray level.
- b) The sum of frequencies up to each gray level.
- c) The difference between consecutive gray levels.
- d) The average intensity of the image.

a. Correct Answer: b)

15. Assume you have an image with gray levels ranging from 50 to 150. You want to apply histogram stretching to map these levels to a new range of 0 to 255.

If the original pixel value is $I=100$, what is the new pixel value after stretching?

Options:

- a) 128
- b) 102
- c) 150
- d) 200

Correct Answer: b) 102

Multimedia Question

16. You are working on an image with 8 gray levels (0 to 7). The histogram of the image is given as follows:

Gray Level	Frequency
0	2
1	5
2	9
3	12
4	10
5	6
6	4
7	2

The total number of pixels in the image is 50.

If histogram equalization is applied, what will be the new gray level for the original gray level 3?

Options:

- a) 3
- b) 4
- c) 5
- d) 6

17. Calculate the cumulative distribution function (CDF):

For gray level 3:

$$C3 = h_0 + h_1 + h_2 + h_3 = 2 + 5 + 9 + 12 = 28$$
$$= h_0 + h_1 + h_2 + h_3 = 2 + 5 + 9 + 12 = 28$$

18. How does the number of quantization levels affect the image quality?

- a) More levels result in better image quality.
- b) Fewer levels result in better image quality.
- c) The number of levels has no effect on image quality.
- d) More levels result in larger image size.

19. What is hypertext?

- A. A type of text that contains links to other texts.
- B. A special font style used for headings.
- C. A format used for printed books.
- D. A type of code used for programming.

20. What is the purpose of sampling in image processing?

- A. To reduce the size of an image.
- B. To increase the color depth of an image.
- C. To convert an analog image into a digital image.
- D. To smooth the edges of an image.

21. What does spatial resolution refer to?

- A. The color depth of an image.
- B. The smallest discernible detail in an image.
- C. The size of the image in bytes.
- D. The compression ratio of the image.

22. What is quantization in image processing?

- A. The process of reducing the size of an image.
- B. The process of converting a continuous range of values into discrete values.
- C. The process of adding noise to an image.
- D. The process of sharpening the edges of an image.