

# Discussion 1

## Exhibit 1-1

Part of the data bank of a corporation is shown below.

Yearly Salary	Employee Rank (1 - 10)	Years of Experience	Department	Gender	Employee Number
\$ 52,443.00	10	15	Accounting	Male	23450
\$111,239.00	7	24	IT	Female	34568
\$ 84,473.00	4	20	Personnel	Female	23123
\$ 47,519.00	1	9	Finance	Male	23007

1. Refer to Exhibit 1-1. Employee Number is an example of \_\_\_\_\_ data.
  - a. nominal
  - b. ordinal
  - c. interval
  - d. ratio

ANS: A

2. Refer to Exhibit 1-1. Gender is an example of \_\_\_\_\_ data.
  - a. nominal
  - b. ordinal
  - c. interval
  - a. ratio

ANS: A

3. Refer to Exhibit 1-1. Years of Experience is an example of \_\_\_\_\_ data.
  - a. nominal
  - b. ordinal
  - c. interval
  - d. ratio

ANS: D

4. Refer to Exhibit 1-1. Employee Rank is an example of \_\_\_\_\_ data.
  - a. nominal
  - b. ordinal
  - c. interval
  - d. ratio

ANS: B

5. Refer to Exhibit 1-1. Yearly Salary is an example of \_\_\_\_\_ data.
- nominal
  - ordinal
  - interval
  - ratio

ANS: D

### Exhibit 1-2

In many universities, students evaluate their professors by means of answering a questionnaire. Assume a questionnaire is distributed to a class of 45 students. Students are asked to answer the following:

- Gender
- Nationality (Saudi, American, Indian, Other)
- Age
- Number of hours completed
- Grade point average
- My instructor is a very effective teacher

5	4	3	2	1
strongly disagree	disagree	neutral	agree	strongly agree

6. Refer to Exhibit 1-2. How many observations are in the above data set?
- 5
  - 6
  - 3
  - 45

ANS: D

7. Refer to Exhibit 1-2. How many variables are in this data set?
- 3
  - 4
  - 5
  - 6

ANS: D

8. Refer to Exhibit 1-2. How many observations are in this data set?
- 5
  - 6
  - 3
  - 45

ANS: D

9. The reported unemployment is 5.5% of the population. What type of scale is used to measure unemployment?
- A) Nominal
  - B) Ordinal
  - C) Interval or ratio
  - D) Descriptive
- Answer: C
10. What type of variable is "projected return on an investment"?
- A) Qualitative
  - B) Continuous
  - C) Attribute
  - D) Discrete
- Answer: B
11. What type of variable is the number of robberies reported in your city?
- A) Attribute
  - B) Continuous
  - C) Discrete
  - D) Qualitative
- Answer: C
12. Your height and weight are examples of which level of measurement?
- A) Nominal
  - B) Ordinal
  - C) Interval
  - D) Ratio
- Answer: D
13. The general process of gathering, organizing, summarizing, analyzing, and interpreting data is called
- A) Statistics.
  - B) Descriptive statistics.
  - C) Inferential statistics.
  - D) Levels of measurement.
- Answer: A
14. A group of women tried five brands of hair spray and ranked them according to preference. What level of measurement is this?
- A) Nominal
  - B) Ordinal
  - C) Interval
  - D) Ratio
- Answer: B
15. Monthly commissions of first-year insurance brokers are \$1,270, \$1,310, \$1,680, \$1,380, \$1,410, \$1,570, \$1,180 and \$1,420. These figures are referred to as:
- A) histogram.
  - B) raw data.
  - C) frequency distribution.
  - D) frequency polygon.
- Answer: B

16. For quantitative data, the relative frequency for a class is computed as
- Class width divided by class interval.
  - Class midpoint divided by the class frequency.
  - Class frequency divided by the class interval.
  - Class frequency divided by the total frequency.
- Answer: D
17. For the following distribution of heights, what are the limits for the class with the greatest frequency?

Heights	60" up to 65"	65" up to 70"	70" up to 75"
Number	10	70	20

- 64 and up to 70
- 65 and 69
- 65 and up to 70
- 69.5 and 74.5

Answer: C

**Use the following to answer questions 18-20:**

Refer to the following wage breakdown for a garment factory.

<u>Hourly Wages</u>	<u>Number of Wage Earners</u>
\$ 4 up to \$7	18
7 up to 10	36
10 up to 13	20
13 up to 16	6

18. What is the class interval for the table of wages above?
- \$2
  - \$3
  - \$4
  - \$5
- Answer: B
19. What is the class midpoint for the class with the greatest frequency?
- \$ 5.50
  - \$ 8.50
  - \$11.50
  - \$14.50
- Answer: B
20. What are the class limits for the class with the smallest number of frequencies?
- 3.5 and 6.5
  - 4 and up to 7
  - 13 and up to 16
  - 12.5 and 15.5
- Answer: C

**Use the following to answer questions 21-23:**

Refer to the following distribution of ages:

<u>Ages</u>	<u>Number</u>
40 up to 50	10
50 up to 60	28
60 up to 70	12

21. For the distribution of ages above, what is the relative class frequency for the lowest class?

- A) 50%
- B) 18%
- C) 20%
- D) 10%

Answer: C

22. What is the class interval?

- A) 9
- B) 10
- C) 10.5
- D) 11

Answer: B

23. What is the class midpoint of the highest class?

- A) 54
- B) 55
- C) 64
- D) 65

Answer: D

**Use the following to answer questions 24-26:**

Refer to the following information from a frequency distribution for heights of college women recorded to the nearest inch:

The first two class midpoints are 62.5" and 65.5".

24. What is the class interval?

- A) 1"
- B) 2"
- C) 2.5"
- D) 3"

Answer: D

25. What are the class limits for the lowest class?

- A) 61 and up to 64
- B) 62 and up to 64
- C) 62 and 65
- D) 62 and 63

Answer: A

26. What are the class limits for the third class?

- A) 64 and up to 67
- B) 67 and 69
- C) 67 and up to 70
- D) 66 and 68

Answer: C

**Use the following to answer questions 27-30:**

Refer to the following frequency distribution on days absent during a calendar year by employees of a manufacturing company:

<u>Days Absent</u>	<u>Cumulative Number of Employees</u>
0 up to 3	60
3 up to 6	31
6 up to 9	14
9 up to 12	6
12 up to 15	2

27. How many employees were absent between 3 up to 6 days?  
A) 31  
B) 29  
C) 14  
D) 2

Answer: A

28. How many employees were absent fewer than six days?  
A) 60  
B) 31  
C) 91  
D) 46

Answer: C

29. How many employees were absent more than five days?  
A) 8  
B) 4  
C) 22  
D) None of the above

Answer: D

30. How many employees were absent from 6 up to 12 days?  
A) 20  
B) 8  
C) 12  
D) 17

Answer: A

31. For an ungrouped data set with an odd number of observations that have been sorted or arrayed from smallest to largest values, where is the median located?  
A)  $n$   
B)  $n/2$   
C)  $(n + 1)/2$   
D)  $n + 1/2$

Answer: C

32. Which of the following measures of dispersion are based on deviations from the mean?  
A) Variance  
B) Standard deviation  
C) Mean deviation  
D) All of the above

Answer: D

33. What is the relationship between the variance and the standard deviation?  
 A) Variance is the square root of the standard deviation  
 B) Variance is the square of the standard deviation  
 C) Variance is twice the standard deviation  
 D) No constant relationship between the variance and the standard deviation  
 Answer: B
34. The weights (in grams) of the contents of several small bottles are 4, 2, 5, 4, 5, 2 and 6. What is the sample variance?  
 A) 6.92  
 B) 4.80  
 C) 1.96  
 D) 2.33  
 Answer: D
35. If the sample variance for a frequency distribution consisting of hourly wages was computed to be 10, what is the sample standard deviation?  
 A) \$1.96  
 B) \$4.67  
 C) \$3.16  
 D) \$10.00  
 Answer: C

QUESTIONS 36 AND 37 ARE BASED ON THE FOLLOWING INFORMATION:

The following data represent the number of children in a sample of 10 families from a certain community:

4      2      1      1      5      3      0      1      0      2

36. a. Compute the mean  
 b. Compute the median  
**ANSWERS:**  
 a.  $\bar{x} = 1.90$   
 b. 1.5
37. a. Compute the range  
 b. Compute the variance  
 c. Compute the standard deviation  
**ANSWERS:**  
 a. 5  
 b.  $s^2 = 2.77$   
 c.  $s = 1.66$

QUESTIONS 38 THROUGH 46 ARE BASED ON THE FOLLOWING INFORMATION:

The following data represent the weights in pounds of a sample of 25 workers:

164    148    137    157    173    156    177    172    169    165  
 145    168    163    162    174    152    156    168    154    151  
 174    146    134    140    171

38. Construct a stem and leaf display for the weights.

**ANSWER:**

Stem	Leaf
13	47
14	0568
15	124667
16	2345889
17	123447

39. Find the median weight.

**ANSWER:**

Median = 162 pounds

40. Determine the value of the lower quartile of the weights.

**ANSWER:**

$$L_{25} = 6.5,$$

$$\text{Value of } Q_1 = 148 + 0.50(151-148) = 149.5$$

41. Determine the value of the upper quartile of the weights.

**ANSWER:**

$$L_{75} = 19.5,$$

$$\text{Value of } Q_3 = 169 + 0.50(171-169) = 170$$

42. Compute the sample mean weight.

**ANSWER:**

$$\bar{x} = 159.04$$

43. Compute the sample variance, and sample standard deviation.

**ANSWER:**

$$s^2 = 156.12, \text{ and } s = 12.49$$

44. Compute the range and interquartile range of the data.

**ANSWER:**

$$\text{Range} = 43,$$

$$\text{IQR} = Q_3 - Q_1 = 170 - 149.5 = 20.5$$

45. Construct a frequency distribution for the data, using five class intervals, and the value 130 as the lower limit of the first class.

**ANSWER:**

Class Limits	Frequency
130 up to 140	2
140 up to 150	4
150 up to 160	6
160 up to 170	7
170 up to 180	6
Total	25

46. Construct a histogram for the data.

47. Is it possible for the standard deviation of a data set to be larger than its variance? Explain.

**ANSWER:**

Yes. A standard deviation is larger than its corresponding variance when the variance is between 0 and 1 (exclusive).