

Mohamed Khidher University

*Faculty of economics, Commercial
and Management Sciences
Department of commerce*

*Specialty: International Commerce & Finance
Module: Time Series Analysis
Academic year 2024/2025*

Exercises series N°1

Exercise One: *choose the right answer for the following questions*

1. What is Time Series data?

- a) Data collected over time at regular intervals
- b) Data collected from multiple sources
- c) Data collected from a single point in time
- d) Data collected for a specific economic sector

2. What does the term "frequency" refer to in Time Series Data?

- a) The rate at which data is collected
- b) The number of data points in the series
- c) The periodicity of the data collection
- d) The amplitude of the data fluctuations

3. Which of the following is an example of Time Series data?

- a) Annual GDP growth rates for a country
- b) A snapshot of unemployment rates across different countries
- c) Monthly sales figures of a company
- d) Population data of a city from a single year

4. What type of data involves observations collected at multiple time points?

- a) Cross-sectional data
- b) Time series data
- c) Panel data
- d) Longitudinal data

5. Which type of data involves observations on multiple entities over time?

- a) Cross-sectional data
- b) Time series data
- c) Panel data
- d) Longitudinal data

6. If a dataset contains information on individuals or entities at a single point in time, what type of data is it?

- a) Time series data
- b) Panel data
- c) Cross-sectional data
- d) Longitudinal data

7. If a dataset contains information on the same individuals or entities over several time periods, what type of data is it?

- a) Time series data
- b) Cross-sectional data
- c) Longitudinal data
- d) Panel data

8. What type of data is often used to study the effects of both time-invariant and time-varying variables?

- a) Cross-sectional data
- b) Time series data
- c) Panel data

9. Which type of data is useful for analyzing individual-level changes over time?

- a) Cross-sectional data
- b) Time series data
- c) Panel data

10. If a dataset contains information on different individuals or entities, each observed at a single point in time, what type of data is it?

- a) Time series data
- b) Panel data
- c) Cross-sectional data
- d) Longitudinal data

11. What measure is primarily used to assess the asymmetry of a data distribution?

- a) Variance
- b) Skewness
- c) Standard deviation
- d) Kurtosis.

12. A distribution with a kurtosis value greater than 3 is described as:

- a) platykurtic
- b) Leptokurtic
- c) Mesokurtic
- d) Normokurtic

13. What does the skewness value indicate when it is positive?

- a) The distribution is symmetric
- b) The distribution has a long right tail.
- c) The distribution has a long left tail.
- d) The distribution is bimodal.

14. The kurtosis of a normal distribution is:

- i. 1
- b) 0
- c) 3
- d) 2

15. Which of the following best defines the mean of a data set?

- A. The most frequent value in the data set
- B. The middle value when data is arranged in order
- C. The sum of all values divided by the number of values
- D. The difference between the largest and smallest values

16. What is the mode in a data set?

- A. The average of all values
- B. The value that appears most frequently
- C. The midpoint value in an ordered data set
- D. The difference between the maximum and minimum values

17. If the mean of a data set is 50 and the sum of all values is 500, how many data points are in the data set?

- A. 5
- B. 10
- C. 15
- D. 20

18. Standard deviation measures:

- A. The most frequent observation in a data set
- B. The spread or dispersion of data from the mean
- C. The difference between the first and third quartiles
- D. The central tendency of the data

19. If a data set has a mean of 20 and a standard deviation of 0, what can you conclude about the data?

- A. All values are 20
- B. The data set is empty
- C. The data is spread out
- D. The data has only one mode

20. What is the relationship between variance and standard deviation?

- A. Variance is the square of the standard deviation
- B. Standard deviation is the square of the variance
- C. Variance and standard deviation are the same
- D. Variance is the reciprocal of standard deviation

21. For a data set [3,7,7,2,9] what is the mode?

- A. 3
- B. 7
- C. 2
- D. 9

22. Which data set has the largest standard deviation?

- A. [1,2,4,3,2]
- B. [10,10,10,10,10]
- C. [11,15,7,19,13]
- D. [9,11,10,9,12]

23. If all the values in a data set are identical, what would be the standard deviation?

- A. 0
- B. 1
- C. Undefined
- D. Cannot be determined

24. For a data set with values [6,8,10,12], what is the variance?

- A. 0
- B. 2.5
- C. 5
- D. 6.25

25. Which of the following is true about standard deviation?

- A. It is the square of the variance
- B. It measures the central tendency of the data
- C. It is a measure of how spread out the data is
- D. It is always a negative number

26. If the mean and median of a data set are equal, what can you infer about the distribution of the data?

- A. The data is positively skewed
- B. The data is negatively skewed
- C. The data is symmetrically distributed
- D. The data has more than one mode

Exercise Two

Exercise: Sector-wise Returns: Consider the annual returns of three sectors (Technology, Finance, and Healthcare) over the past ten years (in percentage): as in the following table

obsno	Tech	Fin-	Health	
1	15,2	8,3	5,6	
2	10,5	6,5	4,1	
3	5,7	2,1	2,9	
4	12,3	8,5	7,8	
5	8,6	12,1	3,9	
6	19,8	4,6	5,3	
7	7,1	7,2	9,5	
8	11,4	10,3	6,3	
9	14,7	8,3	5,6	
10	15,2	6,5	6,7	
11	11,6	12,1	8,1	

1. Calculate the mean return for each sector.
2. Calculate the standard deviation of returns for each sector.
3. Determine the sector with the highest kurtosis.