1. Given a sparse matrix A, which function converts it into a dense NumPy array?

   A) A.CONVERT_TO_DENSE()

   B) A.TOARRAY()

   C) SCIPY.SPARSE.TO_DENSE(A)

   D) A.ARRAY()

   ANSWER: B

2. Given two datasets, data1 and data2, which function from scipy.stats can be used to check if they come from distributions with equal variances?

   A) SCIPY.STATS.LEVENE(DATA1, DATA2)

   B) SCIPY.STATS.VAR_TEST(DATA1, DATA2)

   C) SCIPY.STATS.F_ONEWAY(DATA1, DATA2)

   D) SCIPY.STATS.VARIANCE_TEST(DATA1, DATA2)

   ANSWER: A

3. How can you ensure a file is properly closed after reading or writing in Python?

   A) USE THE CLOSE() METHOD MANUALLY

   B) USE TRY-FINALLY TO CLOSE IT

   C) USE THE WITH STATEMENT

   D) ALL OF THE ABOVE

   ANSWER: D

4. How can you set labels for the x-axis and y-axis of a plot?

   A) PLT.LEGEND()

   B) PLT.XLABEL() AND PLT.YLABEL()

   C) PLT.SET_LABELS()

   D) PLT.TEXT()

   ANSWER: B

5. How do you create multiple plots (subplots) in a single figure in Matplotlib?

   A) PLT.SUBPLOTS()

   B) PLT.MULTI_PLOT()

   C) PLT.SUBPLOT()

   D) PLT.SUBPLOTS_GRID()

   ANSWER: A

6. If a function has both *args and **kwargs parameters, in which order should they appear in the function definition?

   A) *ARGS MUST APPEAR FIRST, FOLLOWED BY **KWARGS

   B) **KWARGS MUST APPEAR FIRST, FOLLOWED BY *ARGS

   C) ORDER DOES NOT MATTER

   D) THEY CANNOT APPEAR TOGETHER

   ANSWER: A

7. If you want to show the relationship between two variables and include confidence intervals in Seaborn, which function would you use?

   A) SNS.BOXPLOT()

   B) SNS.HISTPLOT()

   C) SNS.LMPLOT()

   D) SNS.KDEPLOT()

   ANSWER: C

8. If you wanted to check whether a file exists before opening it, which module would you use?

   A) SYS

   B) OS

   C) RANDOM

   D) MATH

   ANSWER: B

9. In the life cycle of a plot, which function displays the plot on the screen?

A) PLT.SAVE()

B) PLT.SHOW()

C) PLT.DRAW()

D) PLT.RENDER()

ANSWER: B

10. To select rows based on a condition and apply a function only to those rows, which method should be used?

A) APPLY()

B) TRANSFORM()

C) LOC[]

D) GROUPBY()

ANSWER: C

11. What does a sns.lmplot() plot typically show?

A) A CATEGORICAL COMPARISON

B) A LINEAR REGRESSION LINE WITH A SCATTER PLOT OF DATA POINTS

C) A HISTOGRAM WITH A DENSITY PLOT

D) A HEATMAP OF CORRELATION

ANSWER: B

12. What does file.seek(0) do in Python?

A) MOVES THE FILE CURSOR TO THE END OF THE FILE

B) MOVES THE FILE CURSOR TO THE BEGINNING OF THE FILE

C) CLOSES THE FILE

D) READS THE FIRST LINE

ANSWER: B

13. What does the following code do?
    fig, axs = plt.subplots(2, 2)

    A) CREATES A 2X2 GRID OF SUBPLOTS

    B) PLOTS A SINGLE GRAPH IN A 2X2 LAYOUT

    C) CREATES ONE SUBPLOT WITH 2 ROWS AND 2 COLUMNS

    D) CREATES FOUR SEPARATE FIGURES

    ANSWER: A

14. What does the following line of code do?
    plt.plot([1, 2, 3], [4, 5, 6])

    A) PLOTS A BAR CHART

    B) PLOTS A LINE GRAPH WITH X-VALUES [1, 2, 3] AND Y-VALUES [4, 5, 6]

    C) CREATES A PIE CHART

    D) PLOTS A HISTOGRAM

    ANSWER: B

15. What does the sns.lineplot() function typically display?

    A) SCATTER PLOT WITH REGRESSION LINE

    B) LINE PLOT OF DATA POINTS

    C) BAR PLOT WITH COUNTS

    D) HEATMAP OF CORRELATIONS

    ANSWER: B

16. What is the correct sequence of steps in the life cycle of a Matplotlib plot?

    A) PLT.SHOW() → PLT.PLOT() → PLT.TITLE()

    B) PLT.PLOT() → PLT.TITLE() → PLT.SHOW()

    C) PLT.TITLE() → PLT.PLOT() → PLT.SHOW()

    D) PLT.SHOW() → PLT.TITLE() → PLT.PLOT()

    ANSWER: B

17. What is the correct way to call a function my_func that has no parameters?

A) MY_FUNC

B) MY_FUNC()

C) CALL MY_FUNC

D) MY_FUNC([])

ANSWER: B

18. What is the default method used for computing the correlation coefficient in Seaborn's sns.heatmap() when plotting a correlation matrix?

A) PEARSON CORRELATION

B) SPEARMAN CORRELATION

C) KENDALL CORRELATION

D) EUCLIDEAN DISTANCE

ANSWER: A

19. What is the purpose of *args in a function definition?

A) TO PASS A FIXED NUMBER OF ARGUMENTS

B) TO ALLOW THE FUNCTION TO ACCEPT A VARIABLE NUMBER OF POSITIONAL ARGUMENTS

C) TO PASS KEYWORD ARGUMENTS

D) TO RETURN MULTIPLE VALUES

ANSWER: B

20. What kind of relationship does the sns.regplot() function highlight?

A) NON-LINEAR RELATIONSHIP

B) LINEAR RELATIONSHIP WITH A REGRESSION LINE

C) DISTRIBUTION OF A VARIABLE

D) MULTIVARIATE CORRELATION

21. What type of plot is created by the function sns.kdeplot()?

    A) KERNEL DENSITY ESTIMATE PLOT

    B) BAR PLOT

    C) BOX PLOT

    D) HEATMAP

    ANSWER: A

22. What will happen if you try to read from a file opened in "w" mode?

    A) IT WILL RETURN AN EMPTY STRING.

    B) IT WILL RAISE AN ERROR.

    C) IT WILL RETURN THE CONTENT OF THE FILE.

    D) IT WILL OPEN THE FILE IN READ MODE INSTEAD.

    ANSWER: B

23. What will the following code print if test.txt contains the text "Line 1\nLine 2"?
    with open("test.txt", "r") as file:
            lines = file.readlines()
    print(lines[1])

    A) LINE 1

    B) LINE 2

    C) LINE 1 LINE 2

    D) ERROR

    ANSWER: B

24. When plotting time-series data, which of the following functions can help format the x-axis to show dates correctly?

    A) PLT.TIME_AXIS()

    B) PLT.PLOT_DATE()

C) MATPLOTLIB.DATES.DATEFORMATTER

D) PLT.DATE_AXIS()

ANSWER: C

25. Which function in Matplotlib is used to create a simple line plot?

A) PLT.SCATTER()

B) PLT.PLOT()

C) PLT.BAR()

D) PLT.HIST()

ANSWER: B

26. Which function is used to add a title to a Matplotlib plot?

A) PLT.XLABEL()

B) PLT.YLABEL()

C) PLT.TITLE()

D) PLT.LEGEND()

ANSWER: C

27. Which method is used to read the entire contents of a file as a single string?

A) FILE.READ()

B) FILE.READLINE()

C) FILE.READLINES()

D) FILE.READALL()

ANSWER: A

28. Which method is used to specify the number of rows and columns of subplots in Matplotlib?

A) PLT.GRID()

B) PLT.SUBPLOTS(NROWS, NCOLS)

C) PLT.SUBPLOT(NROWS, NCOLS)

D) PLT.MULTI_SUBPLOT()

ANSWER: B

29. Which of the following expressions computes the cumulative product of elements in a 1D NumPy array a = np.array([1, 2, 3, 4])?

    A) NP.CUMPROD(A)

    B) NP.ACCUMULATE(A)

    C) NP.PROD(A, AXIS=0)

    D) NP.PRODUCT(A, CUMULATIVE=TRUE)

    ANSWER: A

30. Which of the following functions would correctly calculate the square of a number passed to it as an argument?

    A) DEF SQUARE(X): RETURN X * X

    B) DEF SQUARE(X): RETURN X + X

    C) DEF SQUARE(): RETURN X ** 2

    D) DEF SQUARE(X): PRINT(X * X)

    ANSWER: A

31. Which of the following is not a built-in function in Python?

    A) SUM

    B) PRINT

    C) AVERAGE

    D) LEN

    ANSWER: C

32. Which of the following is true about functions in Python?

    A) A FUNCTION CAN HAVE MULTIPLE RETURN STATEMENTS.

    B) A FUNCTION MUST ALWAYS RETURN A VALUE.

    C) FUNCTIONS CANNOT CALL OTHER FUNCTIONS.

D) A FUNCTION CAN ONLY ACCEPT ONE ARGUMENT.

ANSWER: A

33. Which of the following operations will correctly flatten a 2D array arr to a 1D array without creating a new copy?

A) ARR.RAVEL()

B) ARR.FLATTEN()

C) ARR.FLAT()

D) ARR.RESHAPE(-1, 1)

ANSWER: A

34. Which of the following statements about default arguments is true?

A) DEFAULT ARGUMENTS MUST COME BEFORE NON-DEFAULT ARGUMENTS.

B) DEFAULT ARGUMENTS MUST COME AFTER NON-DEFAULT ARGUMENTS.

C) DEFAULT ARGUMENTS ARE MANDATORY.

D) FUNCTIONS CANNOT HAVE DEFAULT ARGUMENTS.

ANSWER: B

35. Which Pandas function is used to perform SQL-style joins between two DataFrames?

A) CONCAT()

B) JOIN()

C) MERGE()

D) APPEND()

ANSWER: C

36. Which plot would you use to show the distribution of a continuous variable grouped by a categorical variable?

A) SNS.LINEPLOT()

B) SNS.BOXPLOT()

C) SNS.HISTPLOT()

D) SNS.VIOLINPLOT()

ANSWER: B

37. Which SciPy function can be used to compute the singular value decomposition (SVD) of a matrix?

A) SCIPY.SPARSE.SVD

B) SCIPY.LINALG.SVD

C) SCIPY.STATS.SVD

D) SCIPY.OPTIMIZE.SVD

ANSWER: B

38. Which Seaborn function is used to visualize the relationship between two continuous variables?

A) SNS.BARPLOT()

B) SNS.SCATTERPLOT()

C) SNS.REGPLOT()

D) SNS.COUNTPLOT()

ANSWER: C

39. Which statement is true regarding file modes in Python?

A) "R" MODE IS USED FOR WRITING FILES.

B) "A" MODE APPENDS TO A FILE WITHOUT OVERWRITING.

C) "X" MODE READS A FILE IF IT EXISTS.

D) "W" MODE READS AND WRITES TO A FILE SIMULTANEOUSLY.

ANSWER: B

40. Which syntax is correct to select all rows where the index label is between 'a' and 'c' (inclusive) in a DataFrame df.

A) DF.LOC['A', 'C']

B) DF.LOC['A':'C']

C) DF.ILOC['A':'C']

D) DF['A':'C']

ANSWER: B