**1. Why is Python one of the most popular programming languages among Data Scientists?**

A. Because it is extremely fast and is a compiled language.

B. Because it only supports a static type system, preventing runtime errors.

C. Because of its simple syntax, extensive array of third-party packages and libraries, and ease of code sharing.

D. Because it prioritizes low-level memory management for extreme performance.

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**2. What are the two main types of cells in a Jupyter Notebook?**

A. Python and JavaScript

B. HTML and CSS

C. Code and Markdown

D. Text and Image

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**3. What is the primary purpose of 'magic commands' in a Jupyter Notebook?**

A. To enforce Python's indentation rules.

B. To enhance the functionality and control of the notebook environment.

C. To compile the Python code into a binary executable.

D. To automatically generate documentation from code comments.

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**4. Which magic command is used to measure the execution time of a single statement in a Jupyter Notebook?**

A. %load

B. %run

C. %timeit

D. %store

---

**5. Which magic command is used to execute a Python script from a file within a Jupyter Notebook?**

A. %save

B. %run

C. %time

D. %edit

---

**6. What does a filepath typically include?**

A. Only the file name.

B. The file's creation date.

C. The directory path and file name.

D. The file size and type.

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**7. In Python, why are indentations important?**

A. They are purely for aesthetic purposes to make the code more readable.

B. They are mandatory only for class definitions.

C. They are used to define a block of code, such as what is inside a for, while, or if statement.

D. They are only important in Python 2, but optional in Python 3.

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### 8. Which statement about variable typing in Python is true?

A. Python is a statically-typed language, meaning the type must be declared at assignment.

B. Python is a weakly-typed language, meaning type conversion is always automatic.

C. Python is a dynamically-typed language, where the type of a variable is checked during execution.

D. Python is a compiled language, so types are resolved before runtime.

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### 9. What is the output of the Python expression: print('Bar' * 3)?

A. TypeError: unsupported operand type(s) for *: 'str' and 'int'

B. 'BarBarBar'

C. 'Bar3'

D. 3.0

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### 10. What data type is the object A = {'x': 1, 'y': 2} in Python?

A. List

B. Tuple

C. Dictionary

D. Set

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### 11. What error will be raised by the following code if executed in Python? a = (2, 4, 5, 6) a[3] = 10

A. SyntaxError

B. TypeError: 'tuple' object does not support item assignment

C. IndexError: tuple index out of range

D. ValueError

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### 12. What would be the final output of this code snippet? x = 0 while x <= 3: x += 1 print(x)

A. 3

B. 4

C. 0

D. Infinite Loop

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### 13. What is the printed output of the following code? a = [0, 1, 2, 3] a = [i**2 for i in a] print(a)

A. [0, 2, 4, 6]

B. [0, 1, 4, 9]

C. [0, 1, 2, 3]

D. [1, 4, 9, 16]

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**14. Conditional statement where X = 5 and Y = 10: print('G') if X > Y else print('E') if X == Y else print('L')**

A. G

B. E

C. L

D. None

---

**15. What is the printed output of print(range(5))?**

A. [0, 1, 2, 3, 4]

B. (0, 1, 2, 3, 4)

C. range(0, 5)

D. 5

---

**16. Given a = [2, 8, 5], what is the value of a after executing b = a.sort() and then printing b?**

A. [2, 5, 8]

B. [8, 5, 2]

C. [2, 8, 5]

D. None

---

**17. Which statement is true about Python lambda functions?**

A. They must be explicitly terminated with a return statement.

B. They can contain multiple expressions separated by semicolons.

C. They are limited to a single expression whose result is implicitly returned.

D. They can only be used in conjunction with the map() and filter() functions.

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**18. What is the output of (lambda x: x * 2)(5)?**

A. 10

B. 5

C. lambda x: x * 2

D. 0

---

**19. What would be the output of print({i**2 for i in range(1, 4)})?**

A. [1, 4, 9]

B. {1, 4, 9}

C. {1, 2, 3}

D. (1, 4, 9)

---

**20. Consider a = [0, 1, 1, 2, 3, 5, 8, 13]. What is print(a[-2])?**

A. 8

B. 3

C. 13

D. 5

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**21. Given a = [10, 20, 30, 40, 50, 60], what is print(a[1:5:2])?**

A. [20, 30]

B. [20, 40]

C. [10, 30, 50]

D. [20, 40, 60]

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**22. If def func(a, b): return a+5, b+5 and result = func(1, 2), what is the type of result?**

A. Integer

B. List

C. Tuple

D. Dictionary

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**23. Which two new data structures does the Pandas library introduce?**

A. List and Dictionary

B. Array and Matrix

C. Series and DataFrame

D. Vector and Tensor

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**24. What best describes a Pandas Series object?**

A. A two-dimensional, size-mutable, potentially heterogeneous data structure with labeled axes.

B. A multi-dimensional labeled array-like object capable of holding any data type.

C. A one-dimensional, fixed-size array that can only hold integers.

D. A simple Python list with enhanced mathematical capabilities.

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**25. Consider: s = pd.Series([10, 20, 30], index=['a', 'b', 'c']). Which is correct?**

A. The values are the letters, and the index is the numbers.

B. The index is a default range of integers (0, 1, 2).

C. s is a pandas Series with the index ['a', 'b', 'c'] and values [10, 20, 30].

D. Error because index must be numeric.

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**26. If you add two Pandas Series, what is the behavior?**

A. Elements are added based on index position.

B. Converts Series to lists and adds element-wise.

C. Elements are added based on aligning labels (index), NaN for non-matching.

D. Operation only works if both Series have same length.

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**27. Fundamental structure of a Pandas DataFrame?**

A. One-dimensional labeled array.

B. Three-dimensional array for time series.

C. Tabular data indexed by rows and columns.

D. Collection of Python dictionaries grouped together.

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### 28. Which is NOT a correct operator/method to access DataFrame elements?

A. df[]

B. df.loc[]

C. df.iloc[]

D. df.pos()

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### 29. Which statement about .read_csv() is INCORRECT?

A. Loads data file into a Pandas DataFrame.

B. Can read .tsv and others with arguments.

C. Resulting datatype of each column is always 'object'.

D. First line of file is taken as header by default.

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### 30. The .info() method primarily returns:

A. Descriptive statistics.

B. Info about dtypes, non-null values, memory.

C. List of unique values.

D. Correlation matrix.

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### 31. True or False: Pandas DataFrames have a static schema.

A. True

B. False

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### 32. The process of a groupby operation involves:

A. Transform, Aggregate, Visualize

B. Split, Apply, Combine

C. Load, Clean, Analyze

D. Filter, Map, Reduce

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### 33. Method to rename DataFrame columns?

A. change_names()

B. rename()

C. alter_names()

D. set_names()

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### 34. Add a new column named 'new_col' to df:

A. df.add_column('new_col', values)

B. df['new_col'] = values

C. df.insert('new_col', values)

D. df.append('new_col', values)

---

**35. What is the name of the new data structure introduced by NumPy?**

A. lists

B. ndarray

C. vectors

D. dataframe

---

**36. In a 10x10 ndarray scores, access 5th row and 4th column:**

A. scores[5, 4]

B. scores[4, 3]

C. scores[5, 3]

D. scores[4, 4]

---

**37. Output of np.linspace(0, 10, 5)?**

A. array([0., 2.5, 5., 7.5, 10.])

B. array([0., 2., 4., 6., 8., 10.])

C. array([0, 1, 2, 3, 4])

D. array([0., 5., 10.])

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**38. Main addition of NumPy to Python:**

A. Perform highly efficient multidimensional array operations.

B. Easily read/write CSV and Excel.

C. Create data visualizations.

D. Use Python's built-in list structure for numerical processing.

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**39. Effect of shallow vs deep copy of a mutable object:**

A. Shallow copy changes reflect in original; deep copy changes do not.

B. Both affect the original equally.

C. Neither affects the original.

D. Deep copy changes original; shallow does not.

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**40. Primary difference between a NumPy view and a copy:**

A. View creates new array with duplicated data, copy shares memory.

B. View references same memory, copy allocates new memory.

C. View always 1D, copy can be multi-dimensional.

D. Both create independent arrays.

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