

# Practice Questions for Assessment

## Top 10 Python String Operations MCQs

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**Q1.** What will be the output of:

```
python
CopyEdit
s = "Data Science"
print(len(s))
```

- A) 12
- B) 11
- C) 13
- D) Error

**Answer: A**

*Explanation:* "Data Science" has 12 characters, including the space.

---

**Q2.** Which method converts a string to lowercase?

- A) lowercase()
- B) tolower()
- C) lower()
- D) case\_lower()

**Answer: C**

*Explanation:* `str.lower()` returns a lowercase version of the string.

---

**Q3.** What will be the output of:

```
python
CopyEdit
print("Hello" * 3)
```

- A) HelloHelloHello
- B) Hello Hello Hello
- C) Hello3
- D) Error

**Answer: A**

*Explanation:* The \* operator repeats the string.

---

**Q4.** Which of the following correctly checks if a string starts with "Py"?

- A) `s.startswith("Py")`
- B) `s.startwith("Py")`
- C) `"Py" in s`
- D) `startswith(s, "Py")`

**Answer: A**

*Explanation:* The `startswith()` method checks the prefix.

---

**Q5.** What will be the output of:

```
python
CopyEdit
"Python,Data,Science".split(",")
```

- A) `['Python', 'Data', 'Science']`
- B) `['Python,Data,Science']`
- C) `('Python', 'Data', 'Science')`
- D) `['Python', 'Data Science']`

**Answer: A**

*Explanation:* `split(",")` separates the string by commas.

---

**Q6.** Which method removes whitespace from both ends of a string?

- A) `strip()`
- B) `trim()`
- C) `rstrip()`
- D) `lstrip()`

**Answer: A**

*Explanation:* `strip()` removes leading and trailing whitespace; `lstrip()` and `rstrip()` remove from one side only.

---

**Q7.** What is the result of:

```
python
CopyEdit
s = "DataScience"
print(s[0:4])
```

- A) DataS
- B) Data
- C) ataS
- D) Dat

**Answer: B**

*Explanation:* Slicing 0:4 takes characters at indices 0,1,2,3.

---

**Q8.** Which method replaces all occurrences of "a" with "x" in a string?

- A) `str.replace("a", "x")`
- B) `replace("a", "x")`
- C) `string.replace("a", "x")`
- D) `str.sub("a", "x")`

**Answer: A**

*Explanation:* `replace(old, new)` returns a new string with replacements.

---

**Q9.** What will be the output of:

```
python
CopyEdit
"Data".isalpha()
```

- A) True
- B) False
- C) "True"
- D) Error

**Answer: A**

*Explanation:* `.isalpha()` returns True if all characters are letters.

---

**Q10.** Which method joins a list of strings into one string with - as a separator?

- A) `"-".append(list)`
- B) `"-".join(list)`
- C) `join("-", list)`
- D) `list.join("-")`

**Answer: B**

*Explanation:* `separator.join(iterable)` concatenates items with the separator.

## Top 10 Python Built-in Data Structure MCQs

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**Q1.** Which of the following is **mutable** in Python?

- A) `list`
- B) `tuple`
- C) `set`
- D) Both A and C

**Answer: D**

*Explanation:* Lists and sets are mutable; tuples are immutable.

---

**Q2.** What will be the output of:

```
python
CopyEdit
a = [1, 2, 3]
b = a
b.append(4)
print(a)
```

- A) `[1, 2, 3]`
- B) `[1, 2, 3, 4]`
- C) `[4, 1, 2, 3]`
- D) Error

**Answer: B**

*Explanation:* Lists are mutable and assigned by reference, so `a` and `b` point to the same list.

---

**Q3.** Which statement creates a tuple with a single element 5?

- A) `t = (5)`
- B) `t = (5,)`
- C) `t = tuple(5)`
- D) `t = [5]`

**Answer: B**

*Explanation:* (5,) creates a single-element tuple; (5) is just an integer.

---

**Q4.** Which of the following removes duplicates automatically?

- A) list
- B) tuple
- C) set
- D) dict

**Answer: C**

*Explanation:* Sets store only unique elements.

---

**Q5.** What will be the output of:

```
python
CopyEdit
x = {"a":1, "b":2}
print(x.get("c", 5))
```

- A) None
- B) 0
- C) 5
- D) Error

**Answer: C**

*Explanation:* dict.get(key, default) returns default if the key is missing.

---

**Q6.** Which method is used to add multiple items to a list?

- A) append()
- B) add()
- C) extend()
- D) insert()

**Answer: C**

*Explanation:* extend() adds each element from another iterable to the list.

---

**Q7.** What is the result of:

```
python
```

```
CopyEdit
a = {1, 2, 3}
b = {3, 4, 5}
print(a & b)
```

- A) {1, 2, 3, 4, 5}
- B) {3}
- C) {}
- D) {4, 5}

**Answer: B**

*Explanation:* & performs set intersection.

---

**Q8.** Which of the following is **unordered** and **indexed**?

- A) list
- B) tuple
- C) set
- D) dictionary

**Answer: D**

*Explanation:* Dictionaries are indexed by keys but unordered (in < Python 3.7; from 3.7+ they preserve insertion order but are still conceptually unordered).

---

**Q9.** What will the following code output?

```
python
CopyEdit
my_dict = {"x":1, "y":2}
my_dict["z"] = 3
print(len(my_dict))
```

- A) 2
- B) 3
- C) 1
- D) Error

**Answer: B**

*Explanation:* Adding "z":3 increases the dictionary size to 3.

---

**Q10.** What is the result of:

```
python
```

```
CopyEdit
t = (1, [2, 3])
t[1][0] = 5
print(t)
```

- A) (1, [2, 3])
- B) (1, [5, 3])
- C) Error: Tuples are immutable
- D) (5, [2, 3])

**Answer: B**

*Explanation:* Tuples are immutable, but they can contain mutable elements like lists, which can be changed in place.

## Top 10 NumPy Multiple Choice Questions

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**Q1.** What is the correct way to create a NumPy array from a Python list [1, 2, 3]?

- A) `np.array([1, 2, 3])`
- B) `np.asarray([1, 2, 3])`
- C) Both A and B
- D) `np.list([1, 2, 3])`

**Answer: C**

*Explanation:* Both `np.array()` and `np.asarray()` create NumPy arrays from lists, but `np.asarray()` avoids copying if the input is already an array.

---

**Q2.** What will `np.arange(3, 10, 2)` return?

- A) [3, 5, 7, 9]
- B) [3, 5, 7]
- C) [3, 4, 5, 6, 7, 8, 9]
- D) [3, 6, 9]

**Answer: A**

*Explanation:* `np.arange(start, stop, step)` creates values from start to stop-1 with a step size.

---

**Q3.** Which of the following returns an array of shape (3, 3) filled with zeros?

- A) `np.zeros(3, 3)`

- B) `np.zeros((3, 3))`
- C) `np.zeros[3, 3]`
- D) `np.zeros{3, 3}`

**Answer: B**

*Explanation:* Shape must be passed as a tuple.

---

**Q4.** What will `np.linspace(0, 5, 6)` return?

- A) `[0, 1, 2, 3, 4, 5]`
- B) `[0., 1., 2., 3., 4., 5.]`
- C) `[0., 1., 2., 3., 4., 5.1]`
- D) `[0., 1., 1.5, 3., 4., 5.]`

**Answer: B**

*Explanation:* `linspace` includes both start and end, dividing into equal intervals.

---

**Q5.** Given `arr = np.array([1, 2, 3])`, what will `arr * 2` produce?

- A) `[1, 2, 3, 1, 2, 3]`
- B) `[2, 4, 6]`
- C) `[1, 4, 9]`
- D) Error

**Answer: B**

*Explanation:* NumPy applies element-wise multiplication.

---

**Q6.** Which method reshapes a NumPy array without changing its data?

- A) `reshape()`
- B) `resize()`
- C) `shape()`
- D) `ravel()`

**Answer: A**

*Explanation:* `reshape()` returns a new view or copy with a new shape.

---

**Q7.** What will `np.eye(3)` return?

- A) Identity matrix of shape `(3, 3)`
- B) Diagonal matrix with ones everywhere



- C) Array with ones in every position
- D) Zeros array

**Answer: A**

*Explanation:* `np.eye(n)` creates an identity matrix with ones on the main diagonal.

---

**Q8.** If `arr = np.array([[1,2,3],[4,5,6]])`, what will `arr[1, 2]` return?

- A) 2
- B) 3
- C) 6
- D) [4, 5, 6]

**Answer: C**

*Explanation:* Index [row, column] → row index 1, column index 2 → 6.

---

**Q9.** Which command will flatten a NumPy array into 1D?

- A) `arr.flatten()`
- B) `arr.ravel()`
- C) Both A and B
- D) `arr.flat()`

**Answer: C**

*Explanation:* Both `flatten()` and `ravel()` return 1D arrays, but `flatten()` always returns a copy, `ravel()` returns a view if possible.

---

**Q10.** What is the output of:

```
python
CopyEdit
arr = np.array([np.nan, 1, 2])
np.isnan(arr)
```

- A) [True, False, False]
- B) [False, True, False]
- C) [False, False, True]
- D) Error

**Answer: A**

*Explanation:* `np.isnan()` checks element-wise for NaN.

# Top 10 Pandas Multiple Choice Questions

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**Q1.** What is the correct way to create a Pandas DataFrame from a Python dictionary?

- A) `pd.DataFrame({"A": [1, 2], "B": [3, 4]})`
- B) `pd.dataframe({"A": [1, 2], "B": [3, 4]})`
- C) `pd.df({"A": [1, 2], "B": [3, 4]})`
- D) `pd.table({"A": [1, 2], "B": [3, 4]})`

**Answer: A**

*Explanation:* Pandas is case-sensitive, and the correct constructor is `pd.DataFrame()`.

---

**Q2.** Given `df = pd.DataFrame({"A": [1, 2, 3], "B": [4, 5, 6]})`, what does `df["A"]` return?

- A) A Pandas Series
- B) A Pandas DataFrame
- C) A NumPy array
- D) A Python list

**Answer: A**

*Explanation:* Selecting a single column with `[]` returns a Series by default.

---

**Q3.** What will `df.loc[1, "B"]` return for the DataFrame above?

- A) 4
- B) 5
- C) 6
- D) Error

**Answer: B**

*Explanation:* `.loc[row_label, column_label]` → row label 1 is the second row, column "B" has value 5.

---

**Q4.** Which method is used to remove missing values in Pandas?

- A) `dropna()`
- B) `remove_na()`
- C) `fillna()`
- D) `delna()`

**Answer: A**

*Explanation:* `dropna()` removes rows/columns with NaN values.

---

**Q5.** What is the output shape of `df.head(3)` if `df` has 10 rows and 5 columns?

- A) (3, 5)
- B) (5, 3)
- C) (10, 3)
- D) (3, 10)

**Answer: A**

*Explanation:* `.head(n)` returns the first `n` rows, keeping the original number of columns.

---

**Q6.** If `df["C"] = df["A"] + df["B"]`, what happens?

- A) Adds a new column "C" to `df`
- B) Adds element-wise values from "A" and "B"
- C) Overwrites existing column "C" if present
- D) All of the above

**Answer: D**

*Explanation:* Pandas automatically creates or overwrites the column, performing element-wise addition.

---

**Q7.** What will `df.iloc[0:2, 1]` return?

- A) First 2 rows of column index 1 as a Series
- B) First 2 rows of column index 1 as a DataFrame
- C) First 2 columns of row index 1 as a Series
- D) Error

**Answer: A**

*Explanation:* `.iloc[row_slice, column_index]` with a single column index returns a Series.

---

**Q8.** Which method will combine two DataFrames vertically (stacking rows)?

- A) `pd.merge()`
- B) `pd.concat()`
- C) `pd.join()`
- D) `pd.stack()`

**Answer: B**

*Explanation:* `pd.concat([df1, df2], axis=0)` stacks rows vertically.

---

**Q9.** What is the result of:

```
python
CopyEdit
df = pd.DataFrame({"A": [1, None, 3]})
df.fillna(0)
```

- A) {"A": [1, None, 3]}
- B) {"A": [1, 0, 3]}
- C) Error
- D) Drops the row with None

**Answer: B**

*Explanation:* `fillna(0)` replaces missing values with 0.

---

**Q10.** Given:

```
python
CopyEdit
df = pd.DataFrame({"A": [1, 2, 3], "B": [4, 5, 6]})
df.mean()
```

What is returned?

- A) Mean of all columns as a Series
- B) Mean of all rows as a Series
- C) A single scalar value
- D) Error

**Answer: A**

*Explanation:* By default, `.mean()` operates along `axis=0`, returning column-wise means.

## Top 10 Seaborn Multiple Choice Questions

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**Q1.** What is the primary purpose of Seaborn in Python data science?

- A) Numerical computation
- B) Machine learning model training
- C) Statistical data visualization
- D) Data scraping

**Answer: C**

*Explanation:* Seaborn is built on Matplotlib for statistical and aesthetically pleasing data visualizations.

---

**Q2. Which import statement is most common for Seaborn?**

- A) `import seaborn`
- B) `import seaborn as sb`
- C) `import seaborn as sns`
- D) `import sns`

**Answer: C**

*Explanation:* The convention is `import seaborn as sns`.

---

**Q3. Which Seaborn function is used for creating a scatter plot?**

- A) `sns.scatterplot()`
- B) `sns.pointplot()`
- C) `sns.lmplot()`
- D) Both A and C

**Answer: D**

*Explanation:* `sns.scatterplot()` makes scatter plots, and `sns.lmplot()` can also produce scatter plots with optional regression lines.

---

**Q4. Given:**

```
python
CopyEdit
sns.set_style("whitegrid")
```

What does this do?

- A) Changes Matplotlib's backend
- B) Sets the default plot background to white with grid lines
- C) Removes grid lines from plots
- D) Changes Seaborn's theme to dark

**Answer: B**

*Explanation:* "whitegrid" applies a white background with grid lines, good for statistical plots.

---

**Q5.** Which parameter in `sns.histplot()` specifies the number of bins?

- A) `bins`
- B) `n_bins`
- C) `breaks`
- D) `intervals`

**Answer: A**

*Explanation:* The `bins` parameter controls histogram bin count.

---

**Q6.** Which Seaborn function is best for visualizing the distribution of a single numeric variable?

- A) `sns.boxplot()`
- B) `sns.violinplot()`
- C) `sns.histplot()`
- D) All of the above

**Answer: D**

*Explanation:* All can visualize distributions, but histograms (`histplot`) show frequency counts, while `boxplot`/`violinplot` summarize distributions differently.

---

**Q7.** What does the `hue` parameter in Seaborn plots control?

- A) The color map for continuous variables
- B) Grouping variable that determines color of plot elements
- C) Transparency of plot
- D) The brightness of colors

**Answer: B**

*Explanation:* `hue` groups data visually using different colors.

---

**Q8.** Which function is used for plotting pairwise relationships between numeric variables in a dataset?

- A) `sns.relplot()`
- B) `sns.pairplot()`
- C) `sns.jointplot()`
- D) `sns.catplot()`

**Answer: B**

*Explanation:* `pairplot()` creates a grid of plots showing pairwise relationships.

---

**Q9. Given:**

```
python  
CopyEdit  
sns.heatmap(df.corr(), annot=True)
```

What does `annot=True` do?

- A) Colors the heatmap
- B) Adds numerical correlation values inside cells
- C) Adds axis labels
- D) Normalizes values between 0 and 1

**Answer: B**

*Explanation:* `annot=True` writes the data values inside each cell of the heatmap.

---

**Q10. Which statement about Seaborn and Matplotlib is TRUE?**

- A) Seaborn completely replaces Matplotlib
- B) Seaborn is built on top of Matplotlib
- C) Seaborn cannot be customized using Matplotlib functions
- D) Seaborn does not depend on Matplotlib

**Answer: B**

*Explanation:* Seaborn uses Matplotlib internally and can be customized with Matplotlib functions.

---

## Top 10 scikit-learn Multiple Choice Questions

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**Q1. What is the main purpose of scikit-learn in Python?**

- A) Data visualization
- B) Numerical computation
- C) Machine learning model building and evaluation
- D) Web development

**Answer: C**

*Explanation:* scikit-learn is a machine learning library for model training, evaluation, and preprocessing.

---

**Q2.** Which function splits datasets into training and testing sets in scikit-learn?

- A) `sklearn.utils.split()`
- B) `train_test_split()`
- C) `split_train_test()`
- D) `sklearn.model_selection.divide()`

**Answer: B**

*Explanation:* `train_test_split()` from `sklearn.model_selection` is used for splitting datasets.

---

**Q3.** Which scikit-learn module contains preprocessing utilities like `StandardScaler`?

- A) `sklearn.model_selection`
- B) `sklearn.preprocessing`
- C) `sklearn.pipeline`
- D) `sklearn.metrics`

**Answer: B**

*Explanation:* `sklearn.preprocessing` has scaling, normalization, and encoding tools.

---

**Q4.** Given:

```
python
CopyEdit
from sklearn.linear_model import LinearRegression
model = LinearRegression()
model.fit(X_train, y_train)
```

What does `.fit()` do?

- A) Trains the model on the given data
- B) Splits the dataset
- C) Evaluates model accuracy
- D) Normalizes the data

**Answer: A**

*Explanation:* `.fit()` learns model parameters from training data.

---

**Q5.** Which of the following is NOT a valid scikit-learn estimator?

- A) `LogisticRegression()`
- B) `RandomForestClassifier()`
- C) `KMeans()`
- D) `Sequential()`



**Answer: D**

*Explanation:* `Sequential()` is from Keras, not scikit-learn.

---

**Q6.** Which method is used to generate cross-validation scores?

- A) `train_test_split()`
- B) `cross_val_score()`
- C) `cv_score()`
- D) `evaluate_cv()`

**Answer: B**

*Explanation:* `cross_val_score()` evaluates an estimator using cross-validation.

---

**Q7.** In scikit-learn, what does the `predict()` method return for a classifier?

- A) Class probabilities
- B) Predicted class labels
- C) Loss value
- D) Confusion matrix

**Answer: B**

*Explanation:* `predict()` outputs predicted labels, while `predict_proba()` outputs probabilities.

---

**Q8.** Which parameter in `train_test_split()` controls reproducibility of results?

- A) `random_seed`
- B) `random_state`
- C) `seed`
- D) `state`

**Answer: B**

*Explanation:* `random_state` fixes the random number generator seed for reproducibility.

---

**Q9.** Which of the following metrics is suitable for regression problems?

- A) `accuracy_score`
- B) `mean_squared_error`
- C) `f1_score`
- D) `precision_score`

**Answer: B**

*Explanation:* `mean_squared_error` is a regression metric; the others are classification metrics.

---

**Q10.** What is the correct way to combine multiple preprocessing steps and a model in a single workflow?

- A) Using `Pipeline`
- B) Using `GroupBy`
- C) Using `Concat`
- D) Using `Merge`

**Answer: A**

*Explanation:* `Pipeline` chains preprocessing and model training into one object.

As a python data science examiner, provide top 10 multiple choice questions, with answers for TensorFlow/Keras

ChatGPT said:

Here's a **Python Data Science – TensorFlow / Keras** MCQ set that balances fundamentals, API knowledge, and those “trick” areas examiners like to slip in to see if you really know deep learning workflows.

---

## Top 10 TensorFlow / Keras Multiple Choice Questions

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**Q1.** What is the main purpose of TensorFlow?

- A) Web application development
- B) Statistical data visualization
- C) Machine learning and deep learning model development
- D) File management

**Answer: C**

*Explanation:* TensorFlow is an open-source framework for building and training ML/DL models.

---

**Q2.** Which import is correct for Keras within TensorFlow 2.x?

- A) `import keras`
- B) `from tensorflow import keras`
- C) `import tensorflow.keras as keras`
- D) Both B and C

**Answer: D**

*Explanation:* In TF 2.x, Keras is included as `tf.keras`, and both forms B and C are valid.

---

**Q3.** Which Keras API is used for building models by stacking layers in sequence?

- A) `Sequential()`
- B) `Functional()`
- C) `Pipeline()`
- D) `Graph()`

**Answer: A**

*Explanation:* `Sequential` models stack layers linearly from input to output.

---

**Q4.** In Keras, what does the `model.compile()` method do?

- A) Builds the neural network graph
- B) Configures the model with optimizer, loss function, and metrics
- C) Trains the model
- D) Evaluates the model

**Answer: B**

*Explanation:* `compile()` sets the training configuration before calling `fit()`.

---

**Q5.** What is the purpose of the `epochs` parameter in `model.fit()`?

- A) Number of gradient descent updates per batch
- B) Number of times the entire dataset is passed through the model
- C) Size of each mini-batch
- D) Learning rate

**Answer: B**

*Explanation:* `epochs` defines how many complete passes through the training dataset occur.

---

**Q6.** Which TensorFlow function automatically computes gradients for training?

- A) `tf.GradientTape()`
- B) `tf.grad()`
- C) `tf.autograd()`
- D) `tf.AutoGrad()`

**Answer: A**

*Explanation:* `tf.GradientTape()` records operations for automatic differentiation.

---

**Q7.** In Keras, which layer is typically used as the first layer for image input data of shape (28, 28, 1)?

- A) `Dense(input_shape=(28, 28, 1))`
- B) `Conv2D(filters, kernel_size, input_shape=(28, 28, 1))`
- C) `Flatten(input_shape=(28, 28, 1))`
- D) `Input(shape=(28, 28))`

**Answer: B**

*Explanation:* For CNNs, `Conv2D` is commonly the first layer for image inputs.

---

**Q8.** Which activation function is most commonly used in the output layer for binary classification?

- A) `relu`
- B) `sigmoid`
- C) `softmax`
- D) `tanh`

**Answer: B**

*Explanation:* `sigmoid` outputs probabilities between 0 and 1 for binary classification.

---

**Q9.** In Keras, what does `model.evaluate()` return by default?

- A) Loss value
- B) Metrics values
- C) Both loss and metrics values
- D) Predicted outputs

**Answer: C**

*Explanation:* It returns loss and any metrics defined in `compile()`.

---

**Q10.** What is the role of `model.save('model.h5')` in Keras?

- A) Saves only the model weights
- B) Saves model architecture and weights in HDF5 format
- C) Saves the training dataset
- D) Converts the model to TensorFlow Lite

**Answer: B**

*Explanation:* `.h5` format stores both model structure and trained weights.