

Practice Questions for Assessment

Top 10 Python String Operations MCQs

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

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

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

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

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

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 answer 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

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.