

\* Class Assessment 2 \*

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Thank you..

Q1]

① Explain the concept of broadcasting in Numpy. Provide an example?

① Broadcasting in Numpy is a mechanism that allows arrays with different shapes to be used together in arithmetic operations. When performing operations on an array of different shapes, Numpy automatically "broadcasts" the arrays to make their shapes compatible, without the need for explicit copying of data.

② This allows for efficient element-wise operations on arrays of different shapes.

Example

```
import numpy as np
arr1 = np.array([1, 2, 3],
                [4, 5, 6],
                [7, 8, 9])
```

```
arr2 = np.array([10, 20, 30])
```

```
result = arr1 + arr2
```

```
Print ("Array 1 :")
```

```
Print (arr1)
```

```
Print ("Array 2 :")
```

```
Print (arr2)
```

```
Print ("In result after broadcasting :")
```

```
Print (result)
```

In an example :-

- 1] 'arr1' is a  $3 \times 3$  array & 'arr2' is a  $2 \times 3$  array
- 2] Describe having different shapes, Numpy automatically broadcasts 'arr2' to match the shape of 'arr2'
- 3] The values of 'arr2' are extended along the to match the shape of 'arr2'
- 4] The addition operation is then performed element-wise bet<sup>⑩</sup> the array, resulting in a  $3 \times 3$  array where each element is the sum of the corresponding elements in 'arr1' & 'arr2'

~~(D)~~ Broadcasting in Numpy simplifies the syntax & improves the efficiency of operation involving array with different shapes, making it a powerful feature for working with multidimensional arrays.

Q6] What does NumPy stand for?

- a) Numerical Python
- b) Numeric Processing
- c) Numeric Pythagorean
- d) Numerical Processing in Python

→  
X

Numerical Python

Q7] Which of the following is a valid way to create a Numpy array?

- a) arr = [1, 2, 3]
- b) arr = numpy.array ([1, 2, 3])
- c) arr = np.array (1, 2, 3)
- d) arr = array (1, 2, 3)

Q8] What is the purpose of NumPy's np.zeros function?

- a) Create an array filled with zeros
- b) Calculate the sum of array elements
- c) Return the maximum value in an array
- d) Generate an array with random values.

Create an array filled with zeros

Q9] What is a Dataframe in Pandas?

- a) A two-dimensional labeled data structure
- b) A mathematical Function
- c) A data visualization library
- d) A type of machine learning model

→ A two dimensional labeled data structure

Q 10] How can you select a specific column named 'column\_name' from a Pandas Dataframe df?

- a) df.select\_column ('column\_name')
- b) df.column\_name
- c) df ['column\_name']
- d) df.get\_column ('column\_name')
- df ['column\_name']

Y → Q 11] Import pandas as pd

```
data = {'Student_ID': [1, 2, 3, 4],  
        'Name': ['Alice', 'Bob', 'Charlie', 'David'],  
        'Age': [21, 22, 20, 23],  
        'Grade': ['A', 'B', 'C', 'A']}
```

```
Students_data = pd.DataFrame(data)
```

Which of the following statement is correct for accessing the 'Age' column of the Dataframe students\_data?

- a) Students\_data.Age
- b) Students\_data ['Age']
- c) Students\_data.loc ['Age']
- d) Students\_data.iloc ['Age']

→ Students\_data ['Age']

Q 12] Import pandas as pd

```
data = {'Product_ID': [101, 102, 103, 104],  
        'Category': ['Electronics', 'Clothing', 'Electro', 'Books'],  
        'Price': [799.99, 49.99, 1299.99, 14.99],  
        'Quantity_Sold': [25, 50, 15, 30]}
```

```
Sales_data = pd.DataFrame(data)
```

IF you want to find the total revenue generated from the sales, which of the following expression would you use?

- a] sales\_data['Price'] \* sales\_data['Quantity\_Sold']
- b] sum(sales\_data['Price'] \* sales\_data['Quantity\_Sold'])
- c] sales\_data.groupby('category')['Price'].sum()
- d] sales\_data['Total\_Revenue'] = sales\_data['Price'] \* sales\_data['Quantity\_Sold']  
→ sales\_data['price'] \* sales\_data['Quantity\_Sold']

Q13] Which of the following statement accurately describes the roles and functionalities of Numpy and Pandas in the context of handling and analyzing the sales dataset?

- a] Numpy is primarily used for data manipulation & mathematical operations on homogeneous arrays, while Pandas provide high-level data-structure and functions to manipulate and analyze structured data like DataFrames.
- b] Numpy and Pandas are interchangeable libraries, and both can be used for data manipulation and analysis tasks with equal efficiency.
- c] Pandas is specially designed for numerical operations, whereas Numpy is focused on providing data structures for efficient data storage.
- d] Numpy and Pandas serve the same purpose, and the choice between them is arbitrary based on personal preference  
→

Numpy is primarily used for data manipulation & mathematical operations on homogeneous arrays, while Pandas provide high-level data-structure and functions to manipulate and analyze structured data like DataFrame

Q 14] How can you select the first 3 rows of a Dataframe named df?

- [a] df.iloc [:3]
- [b] df.select\_rows(0,3)
- [c] df.first(3)
- [d] df.head(3)

→ df.iloc [:3]

Q 15] What does the df.dropna() Function do in Pandas?

- [a] Drops all rows with missing values
- [b] Drops all columns with missing values
- [c] Drops the entire Dataframe
- [d] Drops duplicate rows.

→ Drops all rows with missing values

Q 16] Which Pandas Function is used to apply a custom function to each element in a Dataframe?

- [a] df.apply()
- [b] df.map()
- [c] df.transform()
- [d] df.custom()

→ df.apply()

Q 17] How do you sort a Pandas Dataframe by values in a specific column named 'column\_name' in ascending order?

- [a] df.sort\_values('column\_name')
- [b] df.order\_by('column\_name')
- [c] df.sort('column\_name')
- [d] df.sort\_by('column\_name', ascending=True)

→ df.sort\_values('column\_name')

me 18] What is the purpose of `df.nlargest(n, 'column name')` function in Pandas?

- [a] Returns the first n rows of the Dataframe
  - [b] Returns the largest n values in a specific column
  - [c] Returns the smallest n values in a specific column
  - [d] Returns the last n rows of the Dataframe
- Returns the largest n values in a specific column

19] How do you export a Pandas Dataframe named `df` to a CSV file named 'output.csv'?

- [a] `df.save_csv('output.csv')`
  - [b] `df.export_csv('output.csv')`
  - [c] `df.to_csv('output.csv')`
  - [d] `df.write_csv('output.csv')`
- `df.to_csv('output.csv')`

20] What is the purpose of the `pandas(pd).to_datetime()` Function?

- [a] Converts a Dataframe to Numpy array
  - [b] Convert a column a datetime format
  - [c] Convert a Dataframe to a CSV File
  - [d] Converts a column to numerical values.
- Convert a column a datetime format

21] Which Pandas method is used to fill missing values in a Dataframe with a specified value?

- [a] `df.Fillna()`
  - [b] `df.replace_na()`
  - [c] `df.Fill-missing()`
  - [d] `df.fill_values()`
- `df.Fillna()`