Multiple Choice Questions (MCQs)

** Consider the following Pandas DataFrame named df:*

```
import pandas as pd
data = {'Product': ['A', 'B', 'C', 'D'],
        'Price': [100, 150, 200, 50]}
df = pd.DataFrame(data, index=['p1', 'p2', 'p3', 'p4'])
```

Which line of code correctly selects the row with the index label 'p3'?

a) df.iloc[3]
b) df.loc['p3']
c) df[2]
d) df.get['p3']
Answer: b) df.loc['p3']

** In NumPy, what is the result of the following broadcasting operation?*

```
import numpy as np
matrix = np.array([[1, 2, 3],
                   [4, 5, 6]])
vector = np.array([10, 20, 30])
result = matrix + vector
```

a) [[11, 22, 33], [4, 5, 6]]
b) A ValueError because the shapes are incompatible.
c) [[11, 22, 33], [14, 25, 36]]
d) [[11, 12, 13], [24, 25, 26]]
Answer: c) [[11, 22, 33], [14, 25, 36]]

** What are missing values in a dataset and why are they a problem? Describe two common methods for handling missing values in a Pandas DataFrame.*

Answer: Missing values (often NaN) are data points that are not stored for a variable in a dataset. They are a problem because most data analysis algorithms cannot process them and they can lead to biased or incorrect conclusions.

** Explain the difference between an inner join and a left join when merging two Pandas DataFrames.*

Answer:

An inner join (how='inner') returns only the rows where the key exists in both DataFrames. It is the intersection of the two DataFrames.

A left join (how='left') returns all rows from the left DataFrame and only the matching rows from the right DataFrame. If a key from the left DataFrame has no match in the right, the corresponding columns from the right DataFrame will contain NaN.