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In [3]:  # 1.create an array of Employee with salary and display the employees whose salary is less than 50000


         import numpy as np
         import pandas as pd

         # Step 1: Create an array of employee names and their salaries
         employee_names = ["John", "Alice", "Bob", "Eva", "David", "Sophia", "James"]
         salaries = np.array([45000, 60000, 48000, 55000, 35000, 75000, 49000])

         # Step 2: Create a DataFrame to handle employee data
         df = pd.DataFrame({
             'Employee': employee_names,
             'Salary': salaries
         })

         # Step 3: Filter employees whose salary is less than 50,000
         filtered_employees = df[df['Salary'] < 50000]

         # Step 4: Display the result
         print("Employees with salary less than 50,000:")
         print(filtered_employees)
```

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Employees with salary less than 50,000:
  Employee  Salary
0     John   45000
2      Bob   48000
4    David   35000
6    James   49000
```

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In [2]:  # 2. Suppose you have a dataset containing daily temperature readings for a city, and you want to identify days

         # where the temperature either exceeded 35 degrees Celsius (hot day) or dropped below 5 degrees Celsius (cold da
         # Input:
         # temperatures = np.array([32.5, 34.2, 36.8, 29.3, 31.0, 38.7, 23.1, 18.5, 22.8, 37.2,4,25,12,-4,-12])


         import numpy as np

         # Input temperatures for the city
         temperatures = np.array([32.5, 34.2, 36.8, 29.3, 31.0, 38.7, 23.1, 18.5, 22.8, 37.2, 4, 25, 12, -4, -12])

         # Step 1: Define the thresholds for extreme temperatures
         hot_threshold = 35  # Hot day if temperature exceeds 35°C
         cold_threshold = 5  # Cold day if temperature drops below 5°C

         # Step 2: Find the indices of hot and cold days
         hot_days = np.where(temperatures > hot_threshold)[0]  # Indices of hot days
         cold_days = np.where(temperatures < cold_threshold)[0]  # Indices of cold days

         # Step 3: Display the results
         print("Hot days (temperature > 35°C):")
         print(hot_days)

         print("\nCold days (temperature < 5°C):")
         print(cold_days)


         print("\nActual temperatures for hot days:")
         print(temperatures[hot_days])

         print("\nActual temperatures for cold days:")
         print(temperatures[cold_days])
```

```
Hot days (temperature > 35°C):
[2 5 9]

Cold days (temperature < 5°C):
[10 13 14]

Actual temperatures for hot days:
[36.8 38.7 37.2]

Actual temperatures for cold days:
[  4.  -4. -12.]
```

```
In [4]:  # 3. Suppose you have a dataset containing monthly sales data for a company, and you want to split this data in
         # Input: monthly_sales = np.array([120, 135, 148, 165, 180, 155, 168, 190, 205, 198, 210, 225])

         import numpy as np

         # Step 1: Define the monthly sales data
         monthly_sales = np.array([120, 135, 148, 165, 180, 155, 168, 190, 205, 198, 210, 225])
```

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# Step 2: Split the data into quarters (each quarter contains 3 months)
quarters = monthly_sales.reshape(4, 3)

# Step 3: Calculate total sales for each quarter by summing the sales in each quarter
quarterly_sales = np.sum(quarters, axis=1)

# Step 4: Display the quarterly sales report
print("Quarterly Sales Report:")
for i, total_sales in enumerate(quarterly_sales, start=1):
    print(f"Quarter {i}: Total Sales = {total_sales}")
```

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Quarterly Sales Report:
Quarter 1: Total Sales = 403
Quarter 2: Total Sales = 500
Quarter 3: Total Sales = 563
Quarter 4: Total Sales = 633
```

In [ ]: