

Exercise 1

```
1 import numpy as np
2
3 # Create a NumPy array with numbers from 1 to 10
4 arr = np.arange(1, 11)
5
6 # Reshape it into a 2x5 matrix
7 matrix = arr.reshape(2, 5)
8
9 # Print the matrix
10 print(matrix)
```

Run Assignment7

C:\Users\beefa\PycharmProjects\python_assignment_7\.venv\Scripts\python.exe C:\Users\beefa\PycharmProjects\python_assignment_7\Assignment7.py

```
[[ 1  2  3  4  5]
 [ 6  7  8  9 10]]
```

Process finished with exit code 0

Exercise 2

```
1 import numpy as np
2
3 # Create a NumPy array with numbers from 1 to 20
4 arr = np.arange(1, 21)
5
6 # Extract elements between the 5th and 15th index (excluding the 15th index)
7 extracted_elements = arr[5:15]
8
9 # Print the extracted elements
10 print(extracted_elements)
```

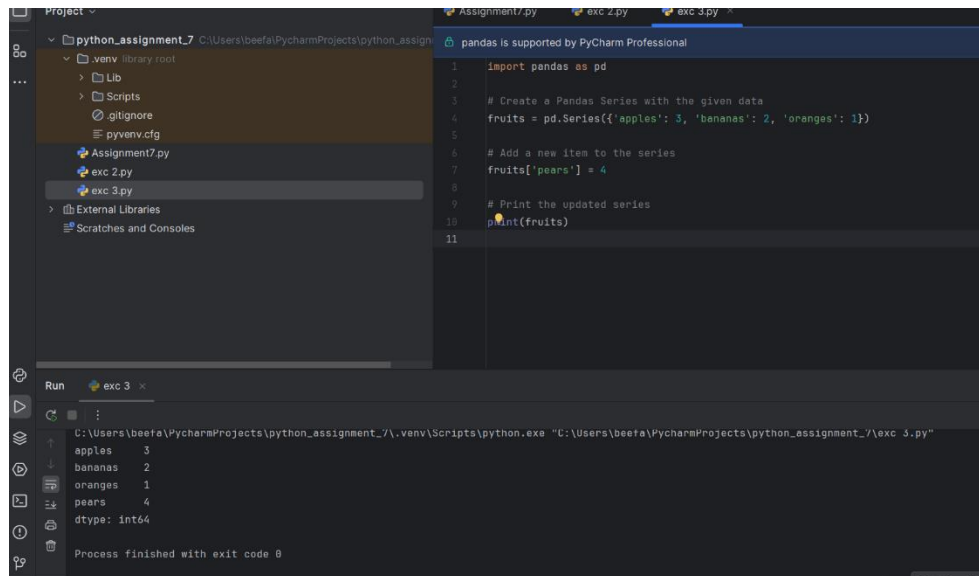
Run exc 2

C:\Users\beefa\PycharmProjects\python_assignment_7\.venv\Scripts\python.exe "C:\Users\beefa\PycharmProjects\python_assignment_7\exc 2.py"

```
[ 6  7  8  9 10 11 12 13 14 15]
```

Process finished with exit code 0

Exercise 3



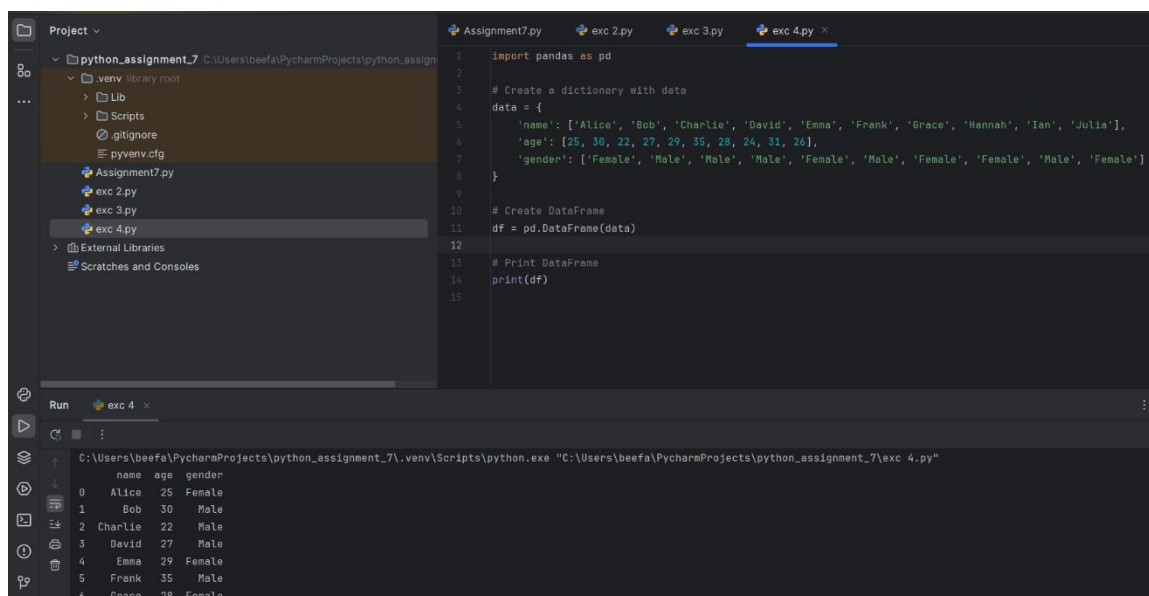
The screenshot shows the PyCharm IDE with a project named 'python_assignment_7'. The file explorer on the left shows a directory structure with files like 'Assignment7.py', 'exc 2.py', and 'exc 3.py'. The main editor window displays the code for 'exc 3.py', which uses Pandas to create a Series and add a new item. The Run console at the bottom shows the output of the code execution.

```
1 import pandas as pd
2
3 # Create a Pandas Series with the given data
4 fruits = pd.Series({'apples': 3, 'bananas': 2, 'oranges': 1})
5
6 # Add a new item to the series
7 fruits['pears'] = 4
8
9 # Print the updated series
10 print(fruits)
11
```

Run console output:

```
C:\Users\beefa\PycharmProjects\python_assignment_7\.venv\Scripts\python.exe "C:\Users\beefa\PycharmProjects\python_assignment_7\exc 3.py"
apples    3
bananas    2
oranges    1
pears      4
dtype: int64
Process finished with exit code 0
```

Exercise 4



The screenshot shows the PyCharm IDE with a project named 'python_assignment_7'. The file explorer on the left shows a directory structure with files like 'Assignment7.py', 'exc 2.py', 'exc 3.py', and 'exc 4.py'. The main editor window displays the code for 'exc 4.py', which uses Pandas to create a DataFrame from a dictionary and print it. The Run console at the bottom shows the output of the code execution.

```
1 import pandas as pd
2
3 # Create a dictionary with data
4 data = {
5     'name': ['Alice', 'Bob', 'Charlie', 'David', 'Emma', 'Frank', 'Grace', 'Hannah', 'Ian', 'Julia'],
6     'age': [25, 30, 22, 27, 29, 35, 28, 24, 31, 26],
7     'gender': ['Female', 'Male', 'Male', 'Male', 'Female', 'Male', 'Female', 'Female', 'Male', 'Female']
8 }
9
10 # Create DataFrame
11 df = pd.DataFrame(data)
12
13 # Print DataFrame
14 print(df)
15
```

Run console output:

```
C:\Users\beefa\PycharmProjects\python_assignment_7\.venv\Scripts\python.exe "C:\Users\beefa\PycharmProjects\python_assignment_7\exc 4.py"
   name  age gender
0  Alice   25  Female
1   Bob   30   Male
2 Charlie   22   Male
3  David   27   Male
4  Emma   29  Female
5  Frank   35   Male
6  Grace   28  Female
```

Exercise 5

The screenshot shows the PyCharm IDE with a project named 'python_assignment_7'. The file explorer on the left shows the project structure, including a 'Scripts' folder and a 'pyvenv.cfg' file. The main editor displays a Python script named 'Assignment7.py' with the following code:

```
1 import pandas as pd
2
3 # Create a dictionary with data
4 data = {
5     'name': ['Alice', 'Bob', 'Charlie', 'David', 'Emma', 'Frank', 'Grace', 'Hannah', 'Ian', 'Julia'],
6     'age': [25, 30, 22, 27, 29, 35, 28, 24, 31, 26],
7     'gender': ['Female', 'Male', 'Male', 'Male', 'Female', 'Male', 'Female', 'Female', 'Male', 'Female']
8 }
9
10 # Create DataFrame
11 df = pd.DataFrame(data)
12
13 # Print DataFrame
14 print(df)
15
16 # Add a new column "occupation"
17 occupations = ['Programmer', 'Manager', 'Analyst', 'Programmer', 'Manager', 'Analyst', 'Programmer', 'Manager', 'Analyst', 'Programmer']
18 df['occupation'] = occupations
19
20 # Print updated DataFrame
21 print(df)
```

The Run console at the bottom shows the output of the script, displaying a DataFrame with 10 rows and 5 columns: name, age, gender, and occupation. The output is as follows:

	name	age	gender	occupation
0	Alice	25	Female	Programmer
1	Bob	30	Male	Manager
2	Charlie	22	Male	Analyst
3	David	27	Male	Programmer
4	Emma	29	Female	Manager
5	Frank	35	Male	Analyst
6	Grace	28	Female	Programmer
7	Hannah	24	Female	Manager
8	Ian	31	Male	Analyst
9	Julia	26	Female	Programmer

Exercise 6

The screenshot shows the PyCharm IDE with the same project 'python_assignment_7'. The file explorer on the left shows the project structure, including a 'Scripts' folder and a 'pyvenv.cfg' file. The main editor displays a Python script named 'Assignment7.py' with the following code:

```
27 'age': [25, 30, 22, 27, 29, 35, 28, 24, 31, 26],
28 'gender': ['Female', 'Male', 'Male', 'Male', 'Female', 'Male', 'Female', 'Female', 'Male', 'Female'],
29 'occupation': ['Programmer', 'Manager', 'Analyst', 'Programmer', 'Manager', 'Analyst', 'Programmer', 'Manager', 'Analyst', 'Programmer']
30 }
31
32 # Create DataFrame
33 df = pd.DataFrame(data)
34
35 # Select rows where age is >= 30
36 df_filtered = df[df['age'] >= 30]
37
38 # Print the filtered DataFrame
39 print(df_filtered)
40
41 # Select rows where age is >= 30
42 df_filtered = df[df['age'] >= 30]
43
44 # Print the filtered DataFrame
45 print(df_filtered)
```

The Run console at the bottom shows the output of the script, displaying a DataFrame with 4 rows and 5 columns: name, age, gender, and occupation. The output is as follows:

	name	age	gender	occupation
1	Bob	30	Male	Manager
5	Frank	35	Male	Analyst
8	Ian	31	Male	Analyst
9	Julia	26	Female	Programmer

Exercise 7

The screenshot shows the PyCharm IDE interface. The left sidebar displays the project structure for 'python_assignment_7', including files like 'Assignment7.py', 'data.csv', and 'exc 2.py' through 'exc 4.py'. The main editor window shows the code for 'exc 4.py', which uses pandas to create a DataFrame, save it to 'data.csv', and then read it back. The bottom panel shows the output of the script, displaying a table of employee data.

```
56 pandas is supported by PyCharm Professional
57 # Create DataFrame
58 df = pd.DataFrame(data)
59
60 # Convert DataFrame to CSV (save the file)
61 df.to_csv(path_or_buf='data.csv', index=False) # 'index=False' prevents writing row indices to the CSV file
62
63 # Read the CSV file back into a DataFrame
64 df_read = pd.read_csv('data.csv')
65
66 # Display the contents of the read DataFrame
67 print(df_read)
68
69
```

Run exc 4

4	Emma	29	Female	Manager
5	Frank	35	Male	Analyst
6	Grace	28	Female	Programmer
7	Hannah	24	Female	Manager
8	Ian	31	Male	Analyst
9	Julia	26	Female	Programmer

Process finished with exit code 0