

Finlatics Data Science

Capsule 3

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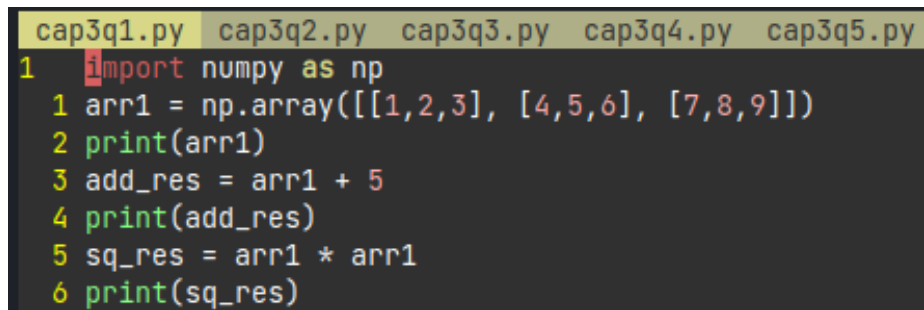
Task 1

3x3 Numpy Array, Add and Square

1.1 PYTHON CODE:

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

1.2 Code

A screenshot of a code editor with a dark background. At the top, there is a tab bar with five tabs labeled 'cap3q1.py', 'cap3q2.py', 'cap3q3.py', 'cap3q4.py', and 'cap3q5.py'. The 'cap3q1.py' tab is selected. Below the tabs, the following Python code is displayed:

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

Figure 1.1: Code

1.3 Output

```
>>> DataScience git:(main) × python cap3q1.py
[[1 2 3]
 [4 5 6]
 [7 8 9]]
[[ 6 7 8]
 [ 9 10 11]
 [12 13 14]]
[[ 1 4 9]
 [16 25 36]
 [49 64 81]]
```

Figure 1.2: Output

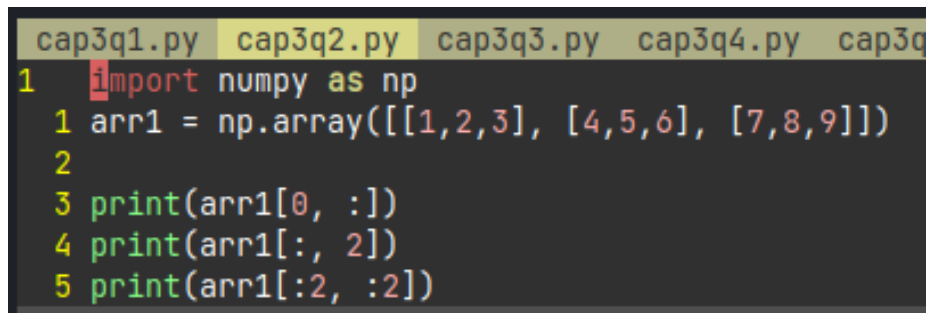
Task 2

3x3 Numpy Array, Extract Sub-Arrays

2.1 PYTHON CODE:

```
1 import numpy as np
2 arr1 = np.array([[1,2,3], [4,5,6], [7,8,9]])
3
4 print(arr1[0, :])
5 print(arr1[:, 2])
6 print(arr1[:2, :2])
```

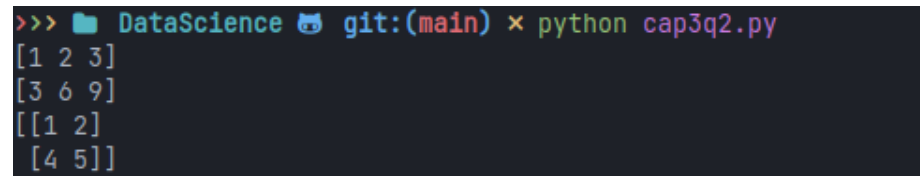
2.2 Code



```
cap3q1.py cap3q2.py cap3q3.py cap3q4.py cap3q
1 import numpy as np
1 arr1 = np.array([[1,2,3], [4,5,6], [7,8,9]])
2
3 print(arr1[0, :])
4 print(arr1[:, 2])
5 print(arr1[:2, :2])
```

Figure 2.1: Code

2.3 Output

A terminal window with a dark background. The prompt is '>>>'. The command 'python cap3q2.py' is entered. The output consists of four lines: '[1 2 3]', '[3 6 9]', '[[1 2]', and '[4 5]]'.

```
>>> DataScience git:(main) × python cap3q2.py
[1 2 3]
[3 6 9]
[[1 2]
 [4 5]]
```

Figure 2.2: Output

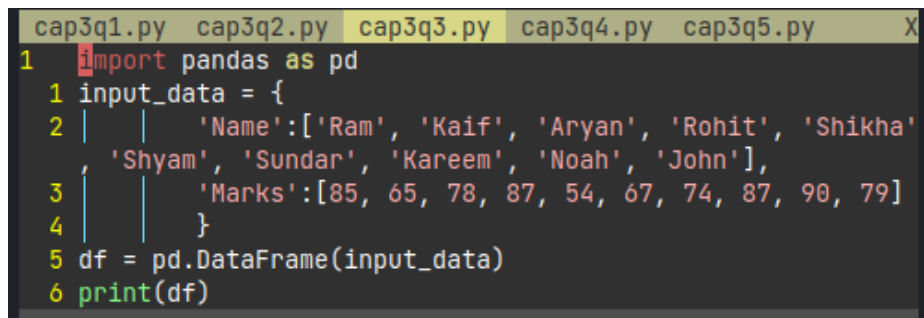
Task 3

DataFrame, Name and Marks

3.1 PYTHON CODE:

```
1 import pandas as pd
2 input_data = {
3     'Name': [ 'Ram', 'Kaif', 'Aryan', 'Rohit', 'Shikha', '
4             'Shyam', 'Sundar', 'Kareem', 'Noah', 'John' ],
5     'Marks': [85, 65, 78, 87, 54, 67, 74, 87, 90, 79]
6 }
7 df = pd.DataFrame(input_data)
8 print(df)
```

3.2 Code



```
cap3q1.py cap3q2.py cap3q3.py cap3q4.py cap3q5.py X
1 import pandas as pd
2 input_data = {
3     'Name': ['Ram', 'Kaif', 'Aryan', 'Rohit', 'Shikha',
4             'Shyam', 'Sundar', 'Kareem', 'Noah', 'John'],
5     'Marks': [85, 65, 78, 87, 54, 67, 74, 87, 90, 79]
6 }
7 df = pd.DataFrame(input_data)
8 print(df)
```

Figure 3.1: Code

3.3 Output

```
>>> DataScience git:(main) x python cap3q3.py
      Name  Marks
0      Ram    85
1     Kaif    65
2    Aryan    78
3    Rohit    87
4   Shikha    54
5    Shyam    67
6   Sundar    74
7  Kareem    87
8     Noah    90
9    John    79
```

Figure 3.2: Output

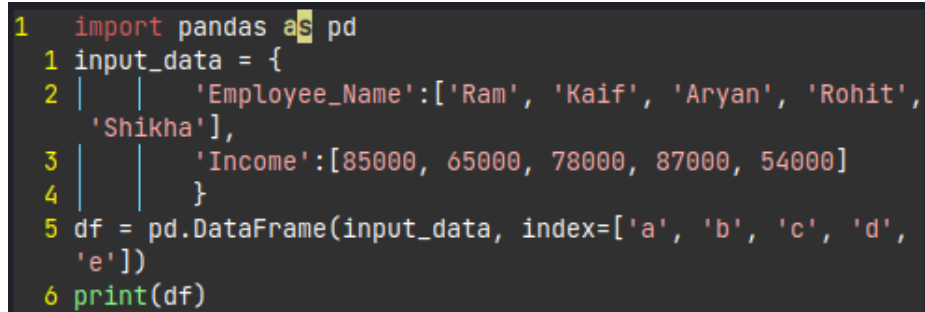
Task 4

DataFrame, Name and Income

4.1 PYTHON CODE:

```
1 import pandas as pd
2 input_data = {
3     'Employee_Name': ['Ram', 'Kaif', 'Aryan', 'Rohit', '
4     'Shikha'],
5     'Income': [85000, 65000, 78000, 87000, 54000]
6 }
7 df = pd.DataFrame(input_data, index=['a', 'b', 'c', 'd',
8     'e'])
9 print(df)
```

4.2 Code

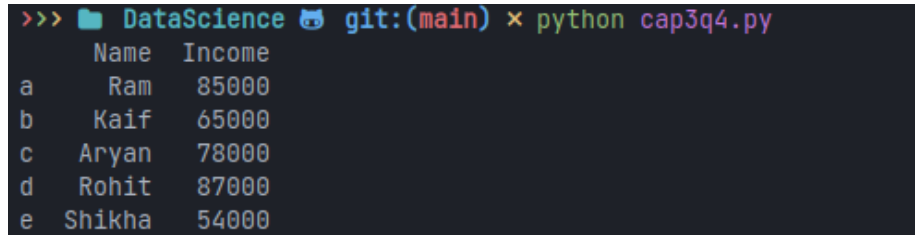


```
1 import pandas as pd
2 input_data = {
3     'Employee_Name': ['Ram', 'Kaif', 'Aryan', 'Rohit',
4     'Shikha'],
5     'Income': [85000, 65000, 78000, 87000, 54000]
6 }
```

```
df = pd.DataFrame(input_data, index=['a', 'b', 'c', 'd',
'e'])
print(df)
```

Figure 4.1: Code

4.3 Output



```
>>> DataScience git:(main) x python cap3q4.py
      Name  Income
a      Ram   85000
b      Kaif   65000
c      Aryan  78000
d      Rohit  87000
e      Shikha 54000
```

Figure 4.2: Output

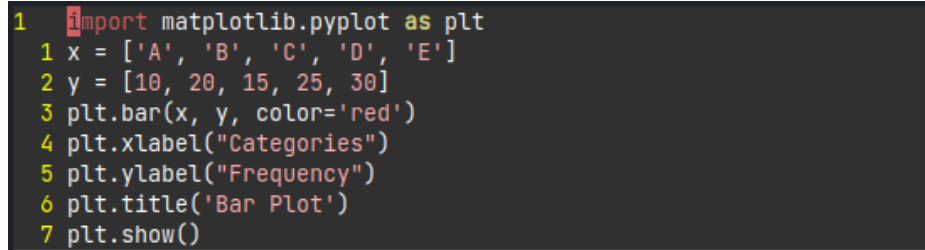
Task 5

Bar Plot

5.1 PYTHON CODE:

```
1 import matplotlib.pyplot as plt
2 x = ['A', 'B', 'C', 'D', 'E']
3 y = [10, 20, 15, 25, 30]
4 plt.bar(x, y, color='red')
5 plt.xlabel("Categories")
6 plt.ylabel("Frequency")
7 plt.title('Bar Plot')
8 plt.show()
```

5.2 Code



```
1 import matplotlib.pyplot as plt
2 x = ['A', 'B', 'C', 'D', 'E']
3 y = [10, 20, 15, 25, 30]
4 plt.bar(x, y, color='red')
5 plt.xlabel("Categories")
6 plt.ylabel("Frequency")
7 plt.title('Bar Plot')
8 plt.show()
```

Figure 5.1: Code

5.3 Output

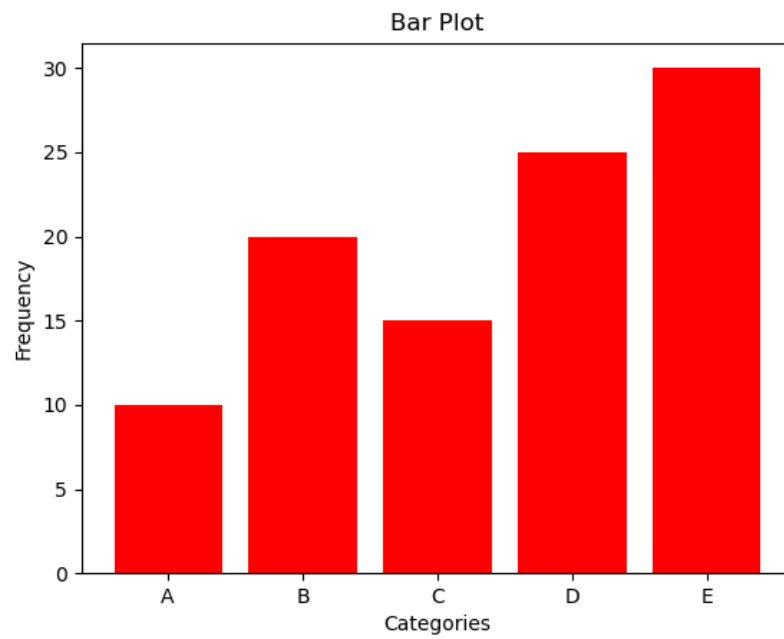


Figure 5.2: Output