

CS 5720 Neural Network Deep Learning

ICP-3

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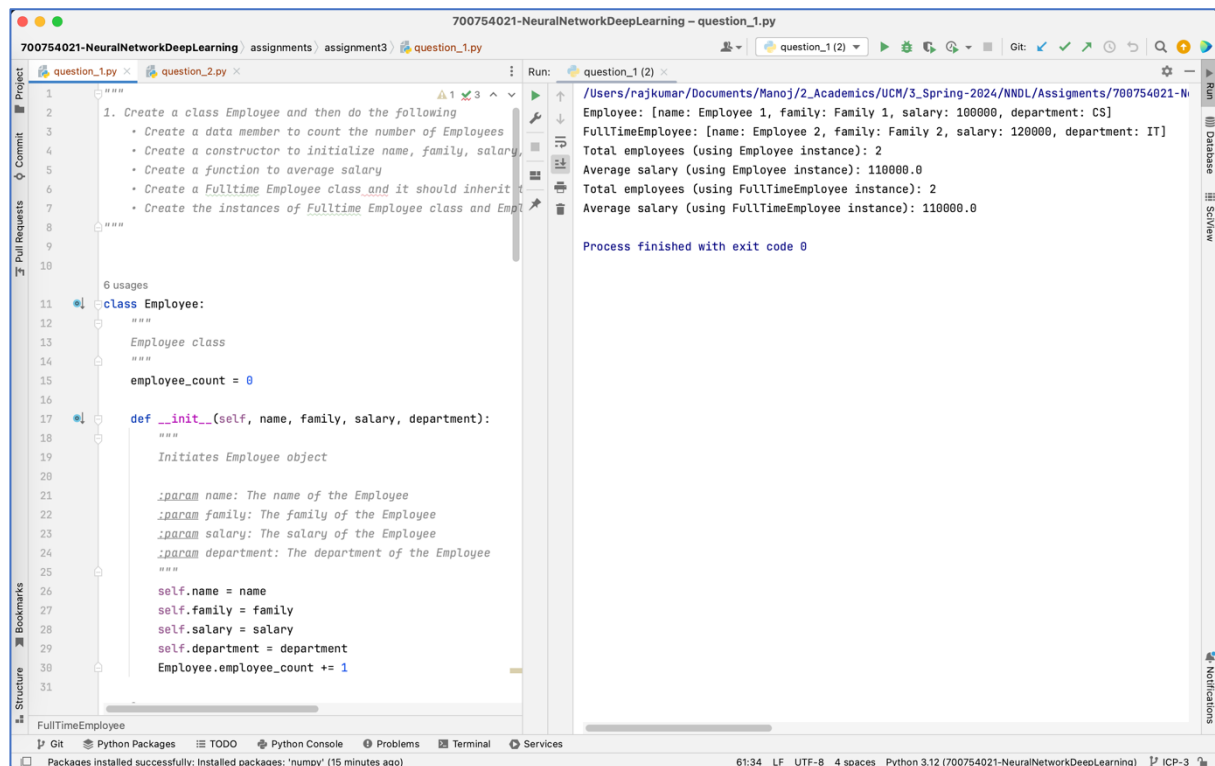
GitHub Repository:

<https://github.com/mxb40210/700754021-NeuralNetworkDeepLearning>

Assignment 3:

<https://github.com/mxb40210/700754021-NeuralNetworkDeepLearning/tree/main/assignments/assignment3>

1. Question 1



The screenshot displays a Jupyter Notebook environment with a file explorer on the left showing the project structure. The main area contains a Python script named `question_1.py`. The script defines an `Employee` class with an `__init__` method and a class attribute `employee_count`. It also shows the creation of an `Employee` instance and the calculation of the average salary. The output of the script is displayed on the right side of the notebook.

```
1. Create a class Employee and then do the following
2. Create a data member to count the number of Employees
3. Create a constructor to initialize name, family, salary, department
4. Create a function to average salary
5. Create a FullTime Employee class and it should inherit from Employee
6. Create the instances of FullTime Employee class and Employee class
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31.

class Employee:
    """
    Employee class
    """
    employee_count = 0

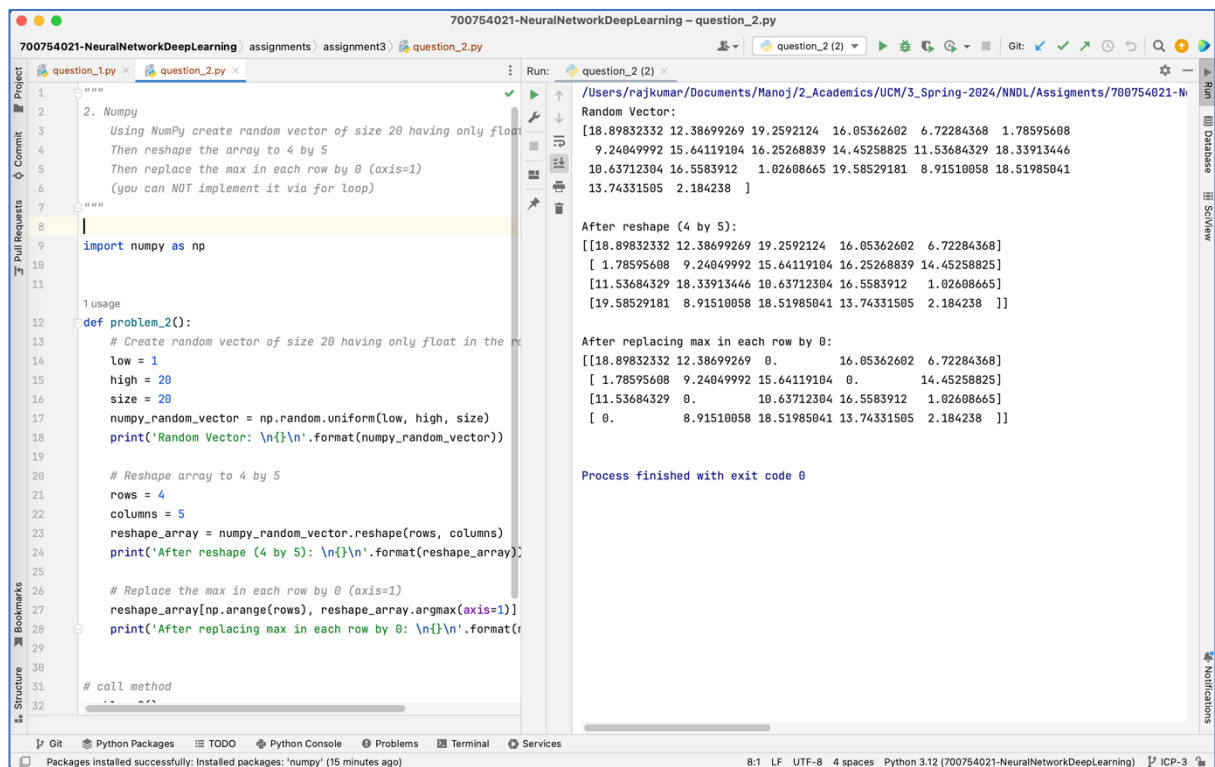
    def __init__(self, name, family, salary, department):
        """
        Initiates Employee object
        :param name: The name of the Employee
        :param family: The family of the Employee
        :param salary: The salary of the Employee
        :param department: The department of the Employee
        """
        self.name = name
        self.family = family
        self.salary = salary
        self.department = department
        Employee.employee_count += 1
```

Output:

```
Employee: [name: Employee 1, family: Family 1, salary: 100000, department: CS]
FullTimeEmployee: [name: Employee 2, family: Family 2, salary: 120000, department: IT]
Total employees (using Employee instance): 2
Average salary (using Employee instance): 110000.0
Total employees (using FullTimeEmployee instance): 2
Average salary (using FullTimeEmployee instance): 110000.0

Process finished with exit code 0
```

2. Question 2



```
1 """
2 2. Numpy
3 Using NumPy create random vector of size 20 having only float in the range [0, 1]
4 Then reshape the array to 4 by 5
5 Then replace the max in each row by 0 (axis=1)
6 (you can NOT implement it via for loop)
7 """
8
9 import numpy as np
10
11 # usage
12 def problem_2():
13     # Create random vector of size 20 having only float in the range [0, 1]
14     low = 1
15     high = 20
16     size = 20
17     numpy_random_vector = np.random.uniform(low, high, size)
18     print('Random Vector: \n{}\n'.format(numpy_random_vector))
19
20     # Reshape array to 4 by 5
21     rows = 4
22     columns = 5
23     reshape_array = numpy_random_vector.reshape(rows, columns)
24     print('After reshape (4 by 5): \n{}\n'.format(reshape_array))
25
26     # Replace the max in each row by 0 (axis=1)
27     reshape_array[np.arange(rows), reshape_array.argmax(axis=1)] = 0
28     print('After replacing max in each row by 0: \n{}\n'.format(reshape_array))
29
30 # call method
31 if __name__ == '__main__':
32     problem_2()
```

Run: question_2 (2) x

/Users/rajakumar/Documents/Manoj/2_Academics/UCM/3_Spring-2024/NNOL/Assignments/700754021-N

Random Vector:

```
[18.89832332 12.38699269 19.2592124 16.05362602 6.72284368 1.78595608
 9.24049992 15.64119104 16.25268839 14.45258825 11.53684329 18.33913446
10.63712304 16.5583912 1.02608665 19.58529181 8.91510058 18.51985041
13.74331505 2.184238 ]
```

After reshape (4 by 5):

```
[[18.89832332 12.38699269 19.2592124 16.05362602 6.72284368]
 [ 1.78595608 9.24049992 15.64119104 16.25268839 14.45258825]
 [11.53684329 18.33913446 10.63712304 16.5583912 1.02608665]
 [19.58529181 8.91510058 18.51985041 13.74331505 2.184238 ]]
```

After replacing max in each row by 0:

```
[[18.89832332 12.38699269 19.2592124 16.05362602 6.72284368]
 [ 1.78595608 9.24049992 15.64119104 16.25268839 14.45258825]
 [11.53684329 18.33913446 10.63712304 16.5583912 1.02608665]
 [ 0.          8.91510058 18.51985041 13.74331505 2.184238 ]]
```

Process finished with exit code 0

Git Python Packages TODO Python Console Problems Terminal Services

8:1 LF UTF-8 4 spaces Python 3.12 (700754021-NeuralNetworkDeepLearning) ICP-3

Package installed successfully: installed packages: 'numpy' (15 minutes ago)