Fall 2023: CS5720

Neural Networks & Deep Learning - ICP-2

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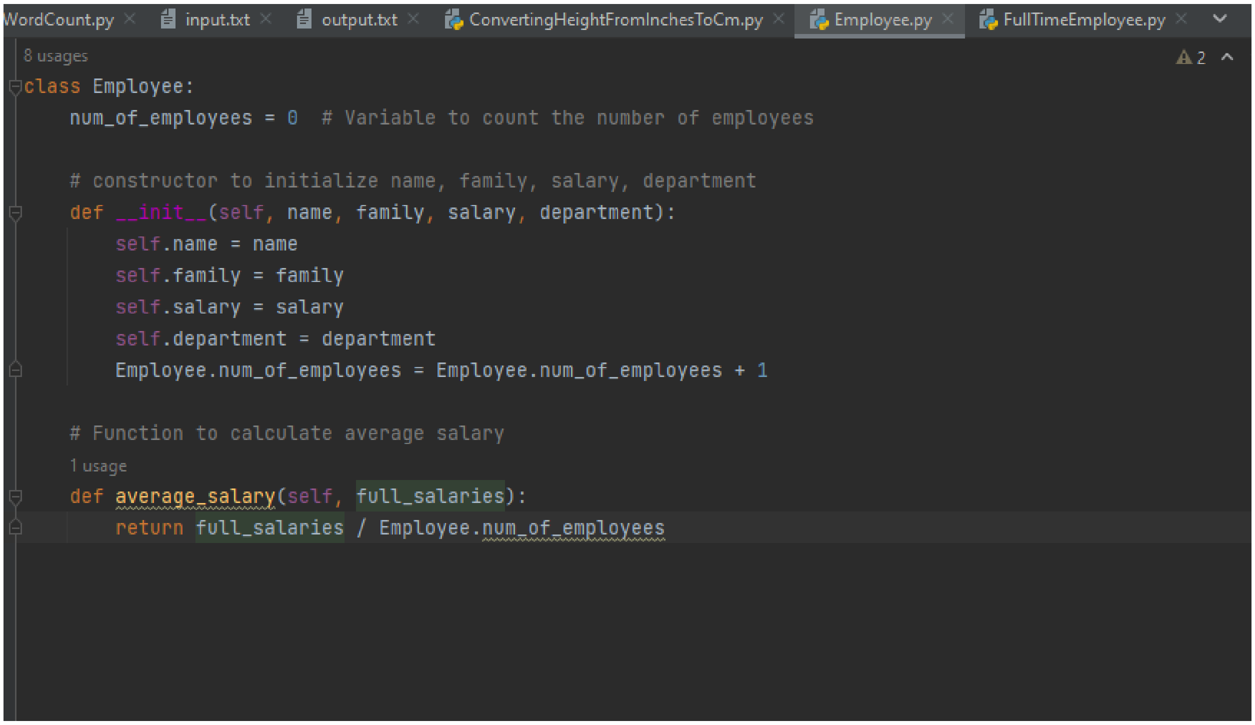
Git link: https://github.com/Mani543/Manisha_NNDL_ICP3.git

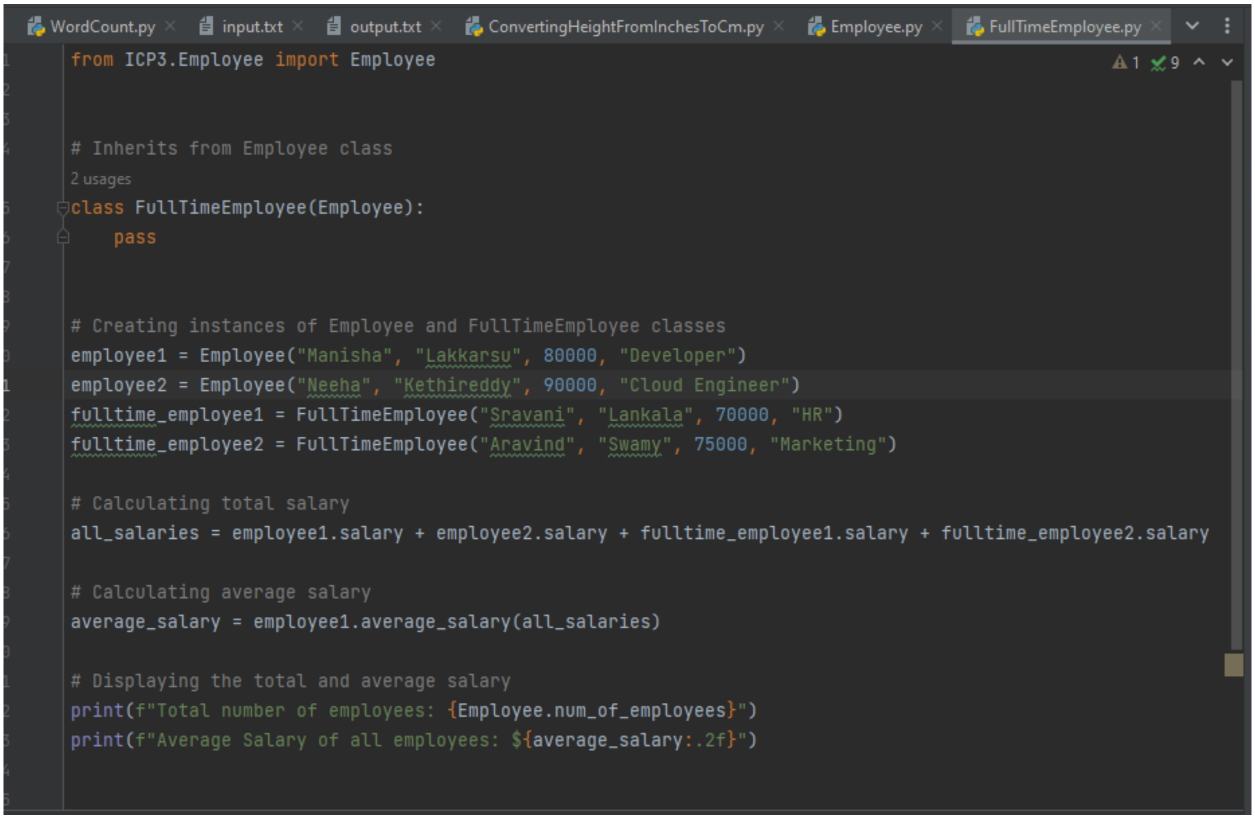
Video link: https://drive.google.com/file/d/1QImXb7SNPBZaXdDHlY1gwsNDl6piHwNG/view?usp=sharing

1. Create a class Employee and then do the following

- Create a data member to count the number of Employees.
- Create a constructor to initialize name, family, salary, department.
- Create a function to average salary.
- Create a Fulltime Employee class and it should inherit the properties of Employee class.
- Create the instances of Fulltime Employee class and Employee class and call their member functions.

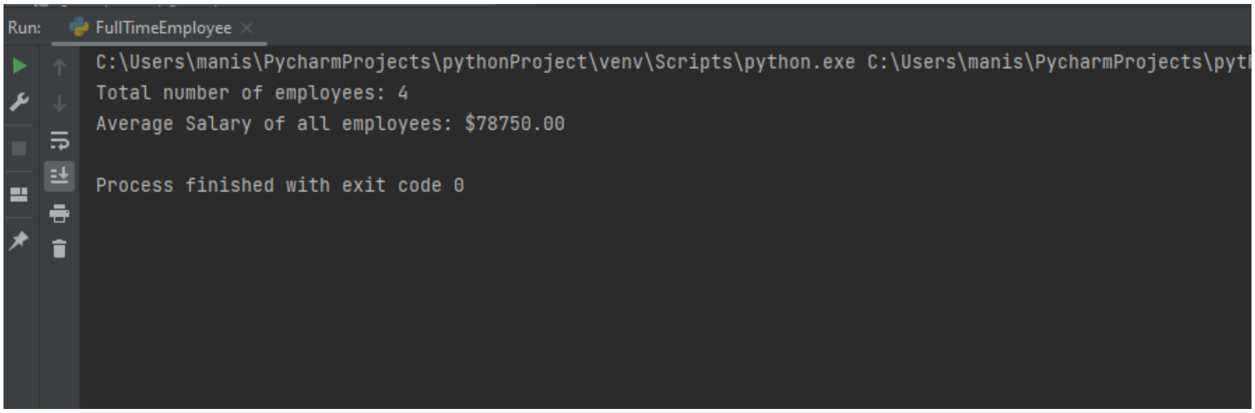


```
class Employee:
    num_of_employees = 0  # Variable to count the number of employees

    # constructor to initialize name, family, salary, department
    def __init__(self, name, family, salary, department):
        self.name = name
        self.family = family
        self.salary = salary
        self.department = department
        Employee.num_of_employees = Employee.num_of_employees + 1

    # Function to calculate average salary
    def average_salary(self, full_salaries):
        return full_salaries / Employee.num_of_employees
```



```python
from ICP3.Employee import Employee


# Inherits from Employee class
class FullTimeEmployee(Employee):
    pass


# Creating instances of Employee and FullTimeEmployee classes
employee1 = Employee("Manisha", "Lakkarsu", 80000, "Developer")
employee2 = Employee("Neeha", "Kethireddy", 90000, "Cloud Engineer")
fulltime_employee1 = FullTimeEmployee("Sravani", "Lankala", 70000, "HR")
fulltime_employee2 = FullTimeEmployee("Aravind", "Swamy", 75000, "Marketing")

# Calculating total salary
all_salaries = employee1.salary + employee2.salary + fulltime_employee1.salary + fulltime_employee2.salary

# Calculating average salary
average_salary = employee1.average_salary(all_salaries)

# Displaying the total and average salary
print(f"Total number of employees: {Employee.num_of_employees}")
print(f"Average Salary of all employees: ${average_salary:.2f}")
```

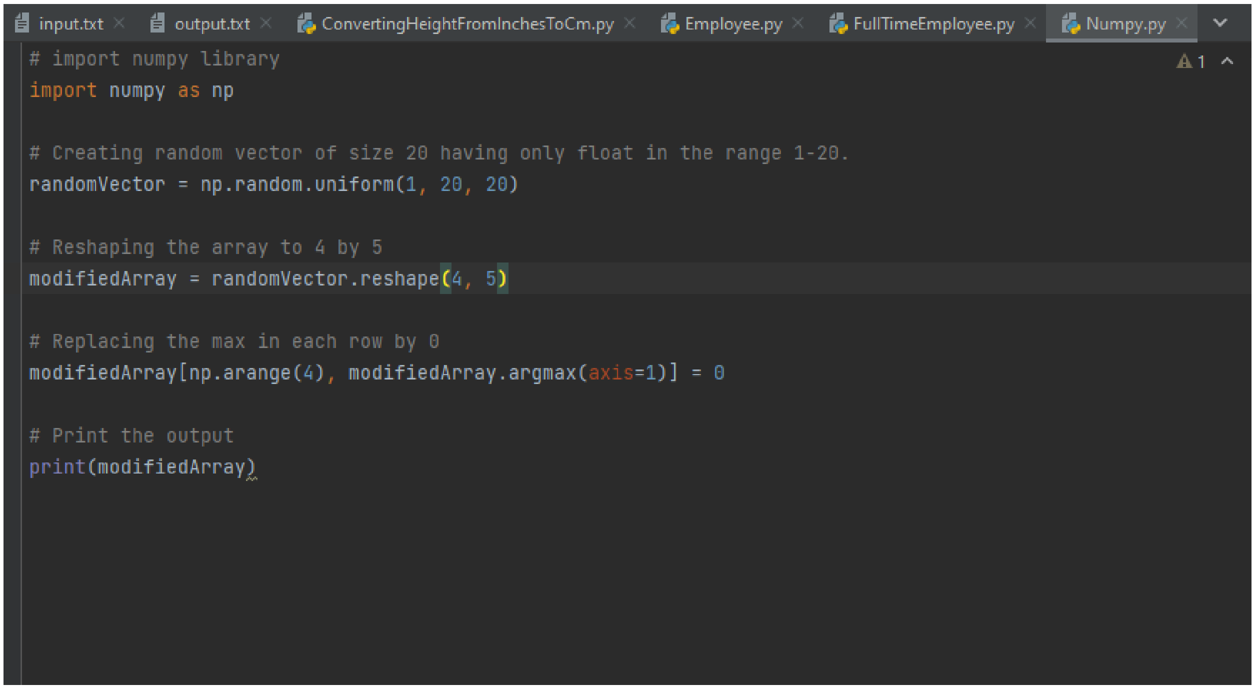
Output:



```
C:\Users\manis\PycharmProjects\pythonProject\venv\Scripts\python.exe C:\Users\manis\PycharmProjects\pyt
Total number of employees: 4
Average Salary of all employees: $78750.00

Process finished with exit code 0
```

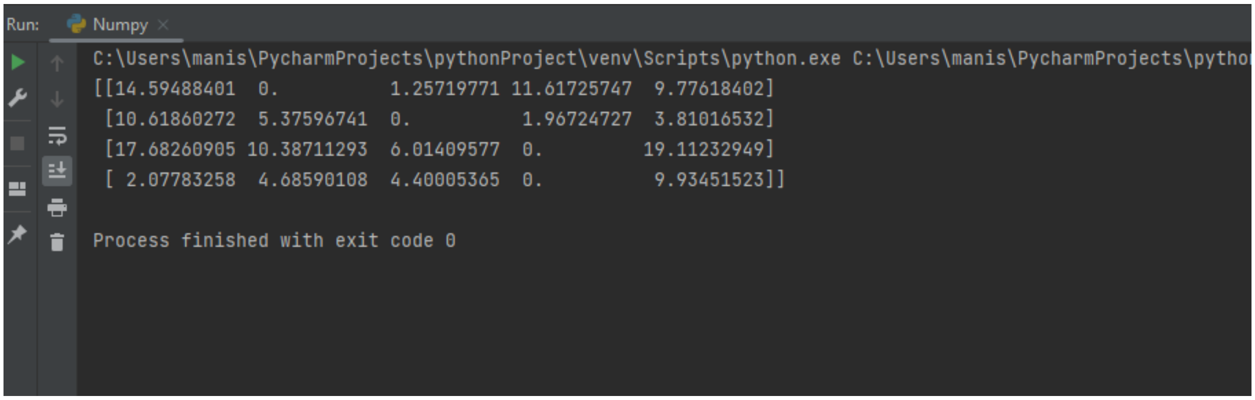
2. Numpy

- Using NumPy create random vector of size 20 having only float in the range 1-20.
- Then reshape the array to 4 by 5.
- Then replace the max in each row by 0 (axis=1).
- (You can NOT implement it via for loop)



```
# import numpy library
import numpy as np

# Creating random vector of size 20 having only float in the range 1-20.
randomVector = np.random.uniform(1, 20, 20)

# Reshaping the array to 4 by 5
modifiedArray = randomVector.reshape(4, 5)

# Replacing the max in each row by 0
modifiedArray[np.arange(4), modifiedArray.argmax(axis=1)] = 0

# Print the output
print(modifiedArray)
```

Output:



```
C:\Users\manis\PycharmProjects\pythonProject\venv\Scripts\python.exe C:\Users\manis\PycharmProjects\pytho
[[14.59488401  0.          1.25719771 11.61725747  9.77618402]
 [10.61860272  5.37596741  0.          1.96724727  3.81016532]
 [17.68260905 10.38711293  6.01409577  0.         19.11232949]
 [ 2.07783258  4.68590108  4.40005365  0.          9.93451523]]

Process finished with exit code 0
```