Neural Network Deep Learning

Assignment – 2

https://github.com/ganeshkonagalla123/Neural-Networks.git

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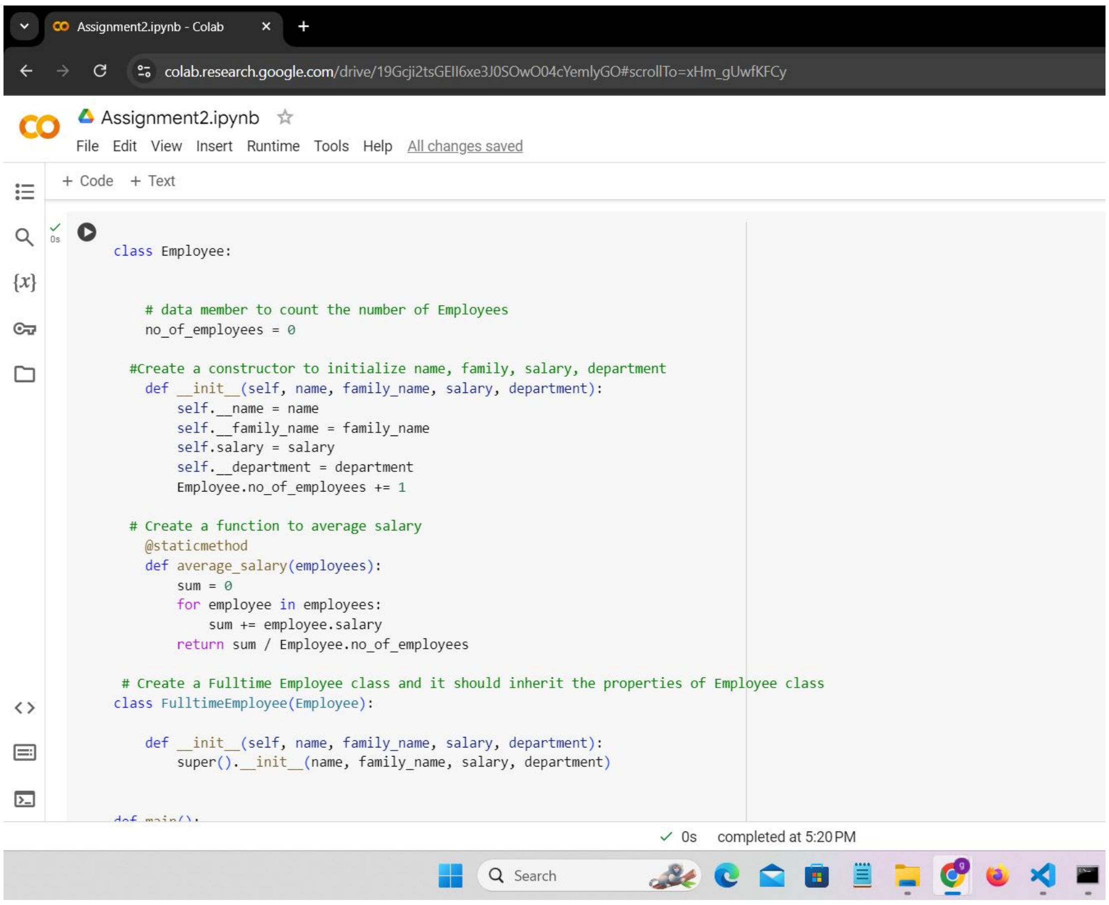
1. Create a class Employee and then do the following

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 Full-time Employee class and it should inherit the properties of Employee class
Create the instances of Full-time Employee class and Employee class and call their member functions.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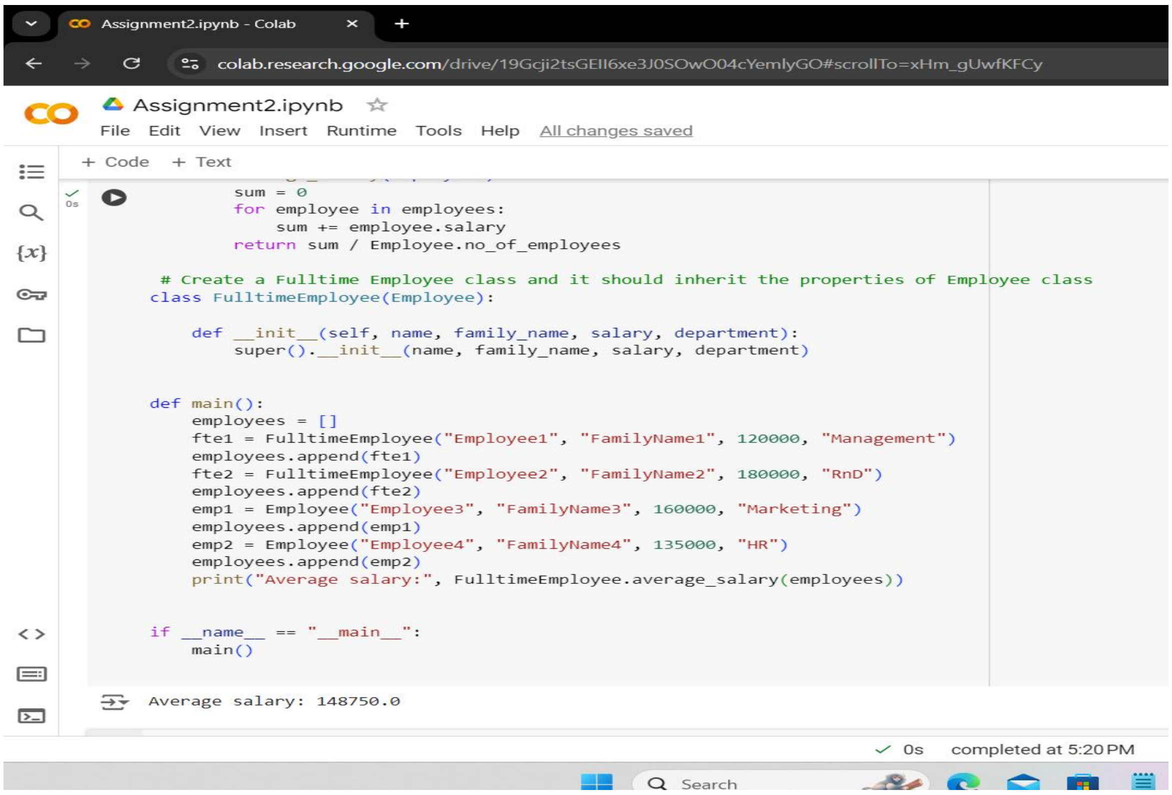
```python
class Employee:


    # data member to count the number of Employees
    no_of_employees = 0

  #Create a constructor to initialize name, family, salary, department
    def __init__(self, name, family_name, salary, department):
        self.__name = name
        self.__family_name = family_name
        self.salary = salary
        self.__department = department
        Employee.no_of_employees += 1

  # Create a function to average salary
    @staticmethod
    def average_salary(employees):
        sum = 0
        for employee in employees:
            sum += employee.salary
        return sum / Employee.no_of_employees

 # Create a Fulltime Employee class and it should inherit the properties of Employee class
class FulltimeEmployee(Employee):

    def __init__(self, name, family_name, salary, department):
        super().__init__(name, family_name, salary, department)


def main():
```



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```python
        sum = 0
        for employee in employees:
            sum += employee.salary
        return sum / Employee.no_of_employees

 # Create a Fulltime Employee class and it should inherit the properties of Employee class
class FulltimeEmployee(Employee):

    def __init__(self, name, family_name, salary, department):
        super().__init__(name, family_name, salary, department)


def main():
    employees = []
    fte1 = FulltimeEmployee("Employee1", "FamilyName1", 120000, "Management")
    employees.append(fte1)
    fte2 = FulltimeEmployee("Employee2", "FamilyName2", 180000, "RnD")
    employees.append(fte2)
    emp1 = Employee("Employee3", "FamilyName3", 160000, "Marketing")
    employees.append(emp1)
    emp2 = Employee("Employee4", "FamilyName4", 135000, "HR")
    employees.append(emp2)
    print("Average salary:", FulltimeEmployee.average_salary(employees))


if __name__ == "__main__":
    main()
```

```
Average salary: 148750.0
```

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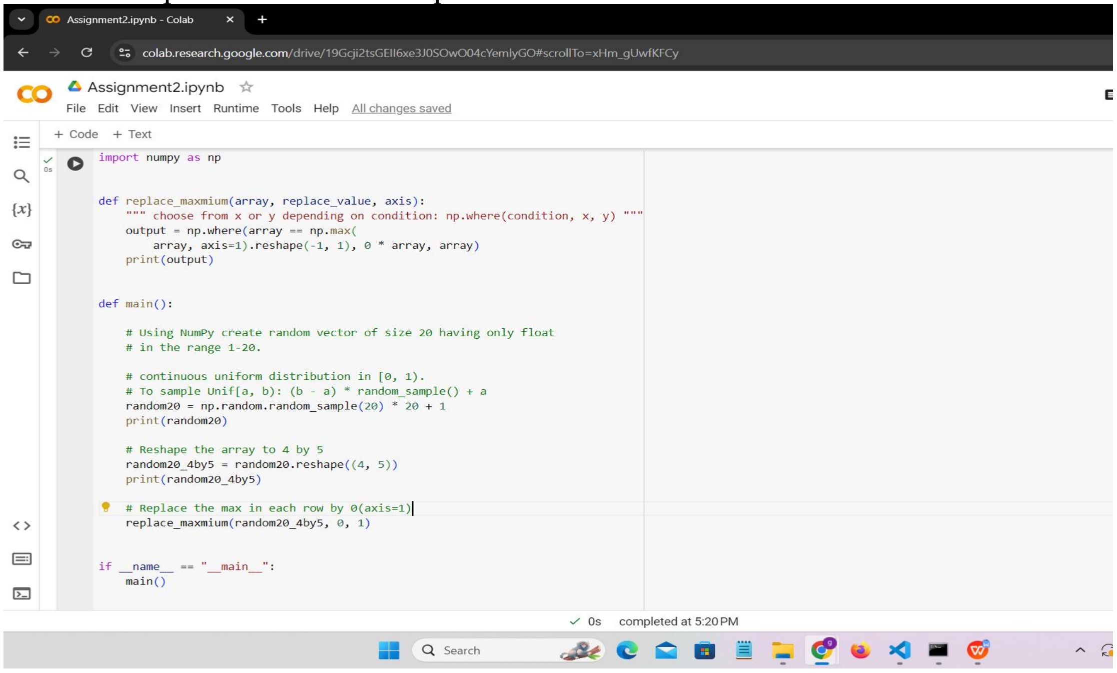
2. Numpy
Using NumPy create random vector of size 20 having only float in the range 1-20. Then reshape the array to 4 by 5 Then replace the max in each row by 0 (axis=1) (you can NOT implement it via for loop.



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```python
import numpy as np


def replace_maxmium(array, replace_value, axis):
    """ choose from x or y depending on condition: np.where(condition, x, y) """
    output = np.where(array == np.max(
        array, axis=1).reshape(-1, 1), 0 * array, array)
    print(output)


def main():

    # Using NumPy create random vector of size 20 having only float
    # in the range 1-20.

    # continuous uniform distribution in [0, 1).
    # To sample Unif[a, b): (b - a) * random_sample() + a
    random20 = np.random.random_sample(20) * 20 + 1
    print(random20)

    # Reshape the array to 4 by 5
    random20_4by5 = random20.reshape((4, 5))
    print(random20_4by5)

    # Replace the max in each row by 0(axis=1)
    replace_maxmium(random20_4by5, 0, 1)


if __name__ == "__main__":
    main()
```

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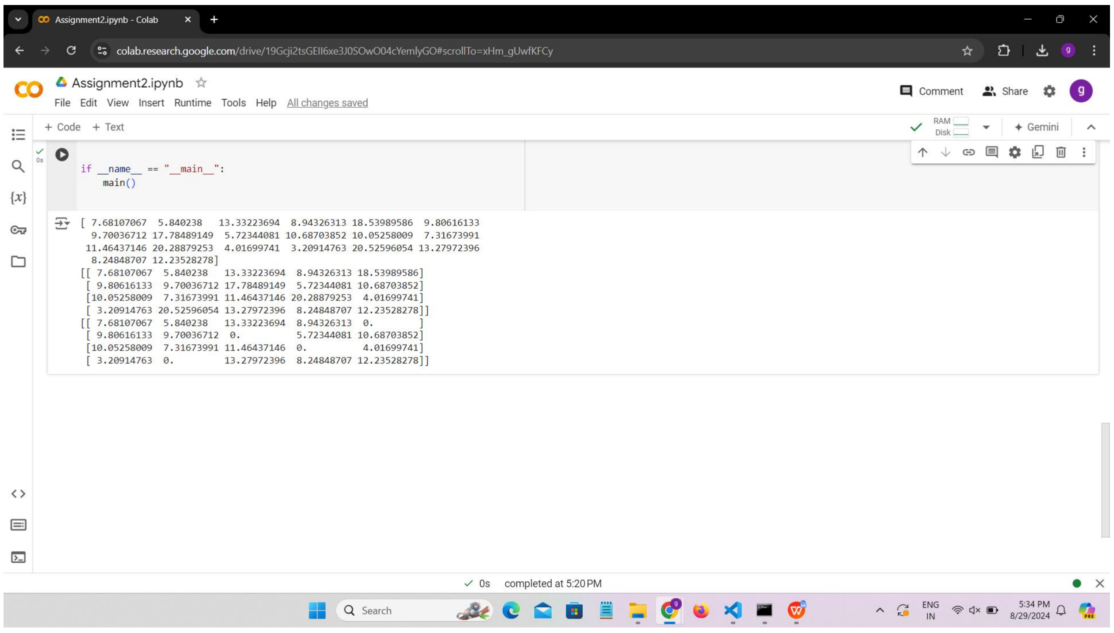
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```python
if __name__ == "__main__":
    main()
```

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[ 7.68107067  5.840238   13.33223694  8.94326313 18.53989586  9.80616133
  9.70036712 17.78489149  5.72344081 10.68703852 10.05258009  7.31673991
 11.46437146 20.28879253  4.01699741  3.20914763 20.52596054 13.27972396
  8.24848707 12.23528278]
[[ 7.68107067  5.840238   13.33223694  8.94326313 18.53989586]
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[[ 7.68107067  5.840238   13.33223694  8.94326313  0.        ]
 [ 9.80616133  9.70036712  0.          5.72344081 10.68703852]
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 [ 3.20914763  0.         13.27972396  8.24848707 12.23528278]]
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