HOMEWORK1 - BASICS AND NUMPY

QUESTION ON FUNCTIONS

```python
#Overtime pay
Total_hours_per_week = float(input("Enter number of hours per week: "))
Base_salary_per_week = float(input("Enter amount of salary per week: "))
if Total_hours_per_week <= 40:
  payment = 45.0*Total_hours_per_week
elif Total_hours_per_week > 40:
  overtime = Total_hours_per_week - 40.0
  payment = 50*overtime + (45*40)
print("Your overtime payment is ", payment)
```

```
Enter number of hours per week: 60
Enter amount of salary per week: 1800
Your overtime payment is  2800.0
```

QUESTION ON LIST

```python
my_list1 = [input("Enter the list of 10 float values: ")]
```

```
Enter the list of 10 float values: 12.4, 16.4, 13.7, 14.9, 19.4, 23.1, 11.3, 32.5, 10.8,
```

```python
my_list1
```

```
['12.4, 16.4, 13.7, 14.9, 19.4, 23.1, 11.3, 32.5, 10.8, 22.8']
```

```python
my_list1 = []
for i in range(10):
  num = float(input("Enter a float number"))
  my_list1.append(num)
```

```
Enter a float number12.4
Enter a float number16.4
Enter a float number13.7
Enter a float number14.9
Enter a float number19.4
Enter a float number23.1
Enter a float number11.3
Enter a float number32.5
Enter a float number10.8
Enter a float number22.8
```

```
my_list1
```

```
    [12.4, 16.4, 13.7, 14.9, 19.4, 23.1, 11.3, 32.5, 10.8, 22.8]
```

```
my_list2 = [y for y in my_list1]
```

```
my_list2
```

```
    [12.4, 16.4, 13.7, 14.9, 19.4, 23.1, 11.3, 32.5, 10.8, 22.8]
```

```
my_list2.sort()
print(my_list2)
```

```
    [10.8, 11.3, 12.4, 13.7, 14.9, 16.4, 19.4, 22.8, 23.1, 32.5]
```

QUESTION ON DICTIONARY

```
my_dict1 ={"School": "MTSU", "Textbooks": 14, "Level": "Elementary", "Hobby": "Dancing", "Hei
```

```
my_dict1
```

```
    {'School': 'MTSU',
     'Textbooks': 14,
     'Level': 'Elementary',
     'Hobby': 'Dancing',
     'Height': 4.5,
     'Food': 'Amala'}
```

```
my_dict1.update({"School": "CMU", "Is_location_Romania": True, "Is_graduated": True})
```

```
my_dict1
```

```
    {'School': 'CMU',
     'Textbooks': 14,
     'Level': 'Elementary',
     'Hobby': 'Dancing',
     'Height': 4.5,
     'Food': 'Amala',
     'Is_location_Romania': True,
     'Is_graduated': True}
```

```
my_dict1.pop("Hobby")
```

```
    'Dancing'
```

```
my_dict1
```

```
{'School': 'CMU',
 'Textbooks': 14,
 'Level': 'Elementary',
 'Height': 4.5,
 'Food': 'Amala',
 'Is_location_Romania': True,
 'Is_graduated': True}
```

```
my_dict1.popitem()
```

```
('Is_graduated', True)
```

```
my_dict1
```

```
{'School': 'CMU',
 'Textbooks': 14,
 'Level': 'Elementary',
 'Height': 4.5,
 'Food': 'Amala',
 'Is_location_Romania': True}
```

QUESTION ON NUMPY

```
import numpy as np
```

```
my_array1 = np.ones((20, 11), dtype=float)
```

```
my_array1
```

```
array([[1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1.],
```

```
          [1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1.],
          [1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1.],
          [1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1.],
          [1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1.]])
```

```
#Multiply scalar of 0.5 by the array

my_array1 = 0.5*my_array1
my_array1
```

```
    array([[0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5],
           [0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5],
           [0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5],
           [0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5],
           [0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5],
           [0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5],
           [0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5],
           [0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5],
           [0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5],
           [0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5],
           [0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5],
           [0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5],
           [0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5],
           [0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5],
           [0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5],
           [0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5],
           [0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5],
           [0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5],
           [0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5],
           [0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5, 0.5]])
```

```
#Update the 6th row with a value of 10.5

my_array1[5,:]=10.5


my_array1
```

```
    array([[ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
           [10.5, 10.5, 10.5, 10.5, 10.5, 10.5, 10.5, 10.5, 10.5, 10.5, 10.5],
           [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
```

```
       [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5]])
```

#Update the 7th row with a value of 11.5

my_array1[6,:]=11.5

my_array1

```
array([[ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [10.5, 10.5, 10.5, 10.5, 10.5, 10.5, 10.5, 10.5, 10.5, 10.5, 10.5],
       [11.5, 11.5, 11.5, 11.5, 11.5, 11.5, 11.5, 11.5, 11.5, 11.5, 11.5],
       [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5]])
```

#Update the 1st column with a value of 9.5

my_array1[:,0]=9.5

my_array1

```
array([[ 9.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 9.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 9.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 9.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 9.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 9.5, 10.5, 10.5, 10.5, 10.5, 10.5, 10.5, 10.5, 10.5, 10.5, 10.5],
       [ 9.5, 11.5, 11.5, 11.5, 11.5, 11.5, 11.5, 11.5, 11.5, 11.5, 11.5],
       [ 9.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 9.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 9.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 9.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 9.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 9.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
       [ 9.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
```

```
      [ 9.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
      [ 9.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
      [ 9.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
      [ 9.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
      [ 9.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
      [ 9.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5]])
```

```
#Slice the 5th row to the 11th in my_array1
```

```
my_array1[4:11,:]
```

```
    array([[ 9.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
           [ 9.5, 10.5, 10.5, 10.5, 10.5, 10.5, 10.5, 10.5, 10.5, 10.5, 10.5],
           [ 9.5, 11.5, 11.5, 11.5, 11.5, 11.5, 11.5, 11.5, 11.5, 11.5, 11.5],
           [ 9.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
           [ 9.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
           [ 9.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5],
           [ 9.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5]])
```

```
#Slice the 6th column to the 9th column in my_array1
```

```
my_array1[:,5:9]
```

```
    array([[ 0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5],
           [10.5, 10.5, 10.5, 10.5],
           [11.5, 11.5, 11.5, 11.5],
           [ 0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5],
           [ 0.5,  0.5,  0.5,  0.5]])
```

```
#Merge the 6th column with 8th column using np.hstack
```

```
my_array6th = my_array1[:,5]
my_array6th
```

```
    array([ 0.5,  0.5,  0.5,  0.5,  0.5, 10.5, 11.5,  0.5,  0.5,  0.5,  0.5,
            0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5,  0.5])
```

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