week1 combined

August 9, 2023

```python
[1]: import csv
     with open('/home/AIML_Student/Documents/210962022_ML/week1/ex.csv','rt') as f:
         data = csv.reader(f)
         for row in data:
             print(row)
```

```
['Title1', ' Title2', ' Title3']
['one', 'two', 'three']
['ex1', 'ex2', 'ex3']
```

```python
[2]: #dictionary
     import csv
     reader = csv.DictReader(open('/home/AIML_Student/Documents/210962022_ML/week1/
      ↪weekdays.csv','rt'))
     for raw in reader:
         print(raw)
```

```
{'Sunday': 'Thursday', 'Monday': 'Friday', 'Tuesday': 'Saturday', 'Wednesday':
''}
```

```python
[3]: #writing in csv
     import csv
     with open("/home/AIML_Student/Documents/210962022_ML/week1/data1.csv",␣
      ↪mode="w") as file:
         writer = csv.writer(file,delimiter=',', quotechar='"',quoting=csv.
      ↪QUOTE_MINIMAL)
         writer.writerow(['Programming Language', 'Designed by', 'Appeared',␣
      ↪'Extension'])
         writer.writerow(['Python','Guido Van Rossam', '1991', '.py'])
         writer.writerow(['Java', 'James Gosling', '1995', '.java'])
         writer.writerow(['C++', 'Bjarne', '1985','.cpp'])
```

```python
[4]: #using pandas
     import pandas as pd
     result = pd.read_csv('/home/AIML_Student/Documents/210962022_ML/week1/data1.
      ↪csv')
     print(result)
```

```
   Programming Language       Designed by  Appeared Extension
0              Python  Guido Van Rossam       1991       .py
1                Java     James Gosling       1995     .java
2                 C++            Bjarne       1985      .cpp
```

[5]:
```python
#writing using pandas
from pandas import DataFrame
temp = {'Sem3':['DS','OOP','IDAP'],
        'Credits':['4','3','3'],
        'Grade':['A','A','B'],
        }
df = DataFrame(temp,columns=['Sem3','Credits','Grade'])
export_csv = df.to_csv(r'/home/AIML_Student/Documents/210962022_ML/week1/data2.
 ↪csv', index=None, header=True)
print(df)
```

```
  Sem3 Credits Grade
0   DS       4     A
1  OOP       3     A
2 IDAP       3     B
```

[6]:
```python
#create arrays
import numpy as np
```

[7]:
```python
a = np.array([1,4,8])
print(a)
print(a.dtype)

b = np.array([4.2,3.8,4.1])
print(b.dtype)
```

```
[1 4 8]
int64
float64
```

[8]:
```python
b = np.array([(1.2,3.4,1.9), (7,8,9)])
print(b)
```

```
[[1.2 3.4 1.9]
 [7.  8.  9. ]]
```

[9]:
```python
c = np.array([[1,2],[3,4]], dtype= complex)
print(c)
```

```
[[1.+0.j 2.+0.j]
 [3.+0.j 4.+0.j]]
```

```
[10]: print(np.zeros((3,4)))
      print(np.ones((2,2), dtype=np.int32))
      #random
      print(np.empty((3,2)))
```

```
[[0. 0. 0. 0.]
 [0. 0. 0. 0.]
 [0. 0. 0. 0.]]
[[1 1]
 [1 1]]
[[1.2 3.4]
 [1.9 7. ]
 [8.  9. ]]
```

```
[11]: print(np.arange(10,30,5))
```

```
[10 15 20 25]
```

```
[12]: print(np.arange(1.1,2,0.1))
```

```
[1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9]
```

```
[13]: #using linespace instead of arange
      print(np.linspace(0,2,9))
```

```
[0.   0.25 0.5  0.75 1.   1.25 1.5  1.75 2.  ]
```

```
[14]: temp = np.arange(12).reshape(4,3)
      print(temp)
```

```
[[ 0  1  2]
 [ 3  4  5]
 [ 6  7  8]
 [ 9 10 11]]
```

```
[15]: print(np.arange(24).reshape(2,3,4))
```

```
[[[ 0  1  2  3]
  [ 4  5  6  7]
  [ 8  9 10 11]]

 [[12 13 14 15]
  [16 17 18 19]
  [20 21 22 23]]]
```

```
[16]: temp = np.array([10,20,30,40])
      print(temp<25)
```

```
[ True  True False False]
```

```
[17]: #matrix product
      A = np.array([[1,1],[0,1]])
      B = np.array([[2,0],[0,4]])
      print(A@B)
      print('dot fn')
      print(A.dot(B))
```

```
[[2 4]
 [0 4]]
dot fn
[[2 4]
 [0 4]]
```

```
[18]: #random number generator
      rg = np.random.default_rng(1)
      b = rg.random((2,3))
      print(b)
```

```
[[0.51182162 0.9504637  0.14415961]
 [0.94864945 0.31183145 0.42332645]]
```

```
[19]: a = rg.random((2,3))
      print(a)
      print(f'The sum is {a.sum()}')
      print(f'The min is {a.min()}')
      print(f'The max is {a.max()}')
```

```
[[0.82770259 0.40919914 0.54959369]
 [0.02755911 0.75351311 0.53814331]]
The sum is 3.1057109529998157
The min is 0.027559113243068367
The max is 0.8277025938204418
```

```
[20]: # convert 1D array to 2D array
      import numpy as np
      a = np.array([0,1,2,3,4,5,6,7,8])
      print(a.reshape(3,3))
```

```
[[0 1 2]
 [3 4 5]
 [6 7 8]]
```

```
[21]: # replace all odd numbers with -1
      import numpy as np
      a = np.array([0,1,2,3,4,5,6,7,8])
      a[a%2==1] = -1
```

```
print(a)
```

```
[ 0 -1  2 -1  4 -1  6 -1  8]
```

[22]:
```python
#positions with greater value
import numpy as np
x = np.array([21, 64, 86, 22, 74, 55, 81, 79, 90, 89])
y = np.array([21, 7, 3, 45, 10, 29, 55, 4, 37, 18])

print(np.where(x>y))
print(np.where(x==y))
```

```
(array([1, 2, 4, 5, 6, 7, 8, 9]),)
(array([0]),)
```

[23]:
```python
import numpy as np
temp = np.arange(100).reshape(5,-1)
# print(temp)
print(temp[0:5,0:4])
```

```
[[ 0  1  2  3]
 [20 21 22 23]
 [40 41 42 43]
 [60 61 62 63]
 [80 81 82 83]]
```

[ ]: