OSS LAB ASSIGNMENT-4

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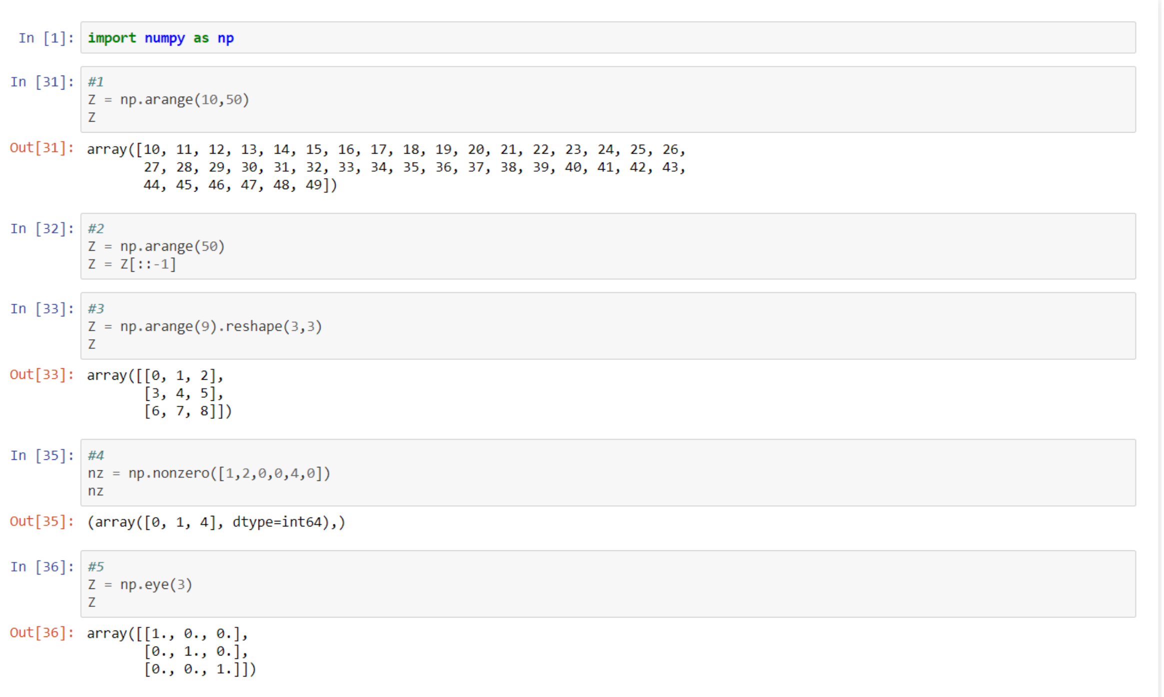
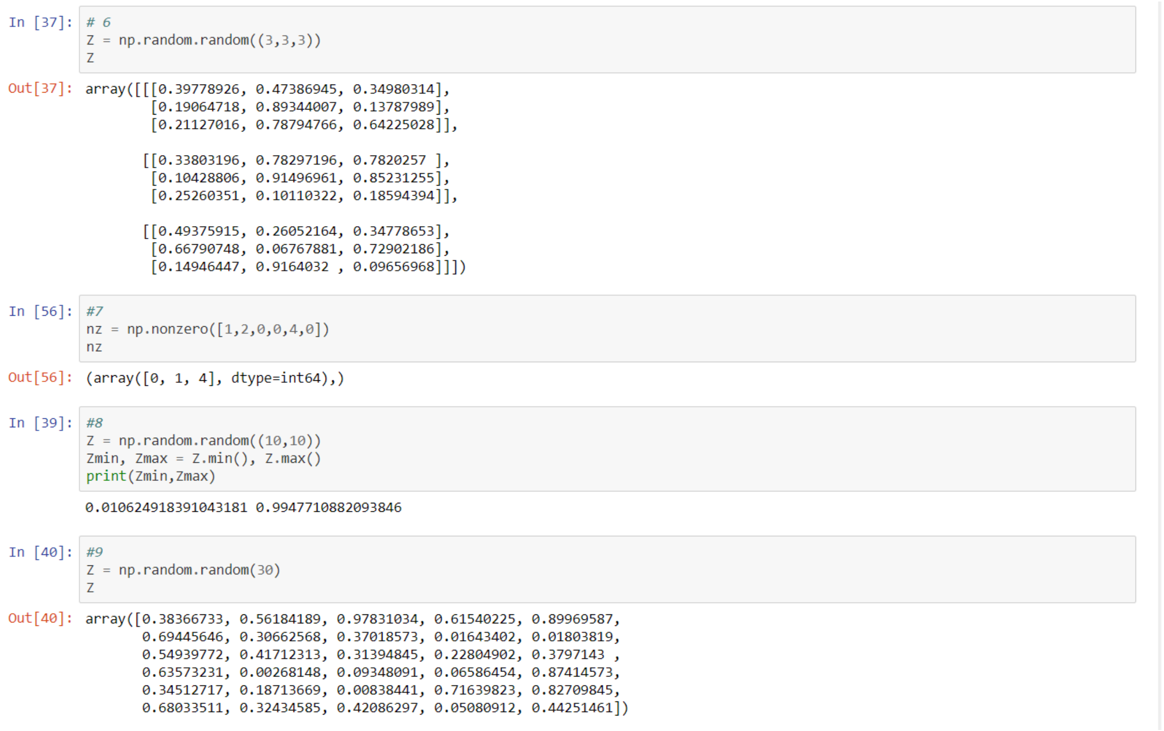


```
In [1]: import numpy as np

In [31]: #1
         Z = np.arange(10,50)
         Z

Out[31]: array([10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26,
                27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43,
                44, 45, 46, 47, 48, 49])

In [32]: #2
         Z = np.arange(50)
         Z = Z[::-1]

In [33]: #3
         Z = np.arange(9).reshape(3,3)
         Z

Out[33]: array([[0, 1, 2],
                [3, 4, 5],
                [6, 7, 8]])

In [35]: #4
         nz = np.nonzero([1,2,0,0,4,0])
         nz

Out[35]: (array([0, 1, 4], dtype=int64),)

In [36]: #5
         Z = np.eye(3)
         Z

Out[36]: array([[1., 0., 0.],
                [0., 1., 0.],
                [0., 0., 1.]])
```



```
In [37]: # 6
         Z = np.random.random((3,3,3))
         Z

Out[37]: array([[[0.39778926, 0.47386945, 0.34980314],
                 [0.19064718, 0.89344007, 0.13787989],
                 [0.21127016, 0.78794766, 0.64225028]],

                [[0.33803196, 0.78297196, 0.7820257 ],
                 [0.10428806, 0.91496961, 0.85231255],
                 [0.25260351, 0.10110322, 0.18594394]],

                [[0.49375915, 0.26052164, 0.34778653],
                 [0.66790748, 0.06767881, 0.72902186],
                 [0.14946447, 0.9164032 , 0.09656968]]])

In [56]: #7
         nz = np.nonzero([1,2,0,0,4,0])
         nz

Out[56]: (array([0, 1, 4], dtype=int64),)

In [39]: #8
         Z = np.random.random((10,10))
         Zmin, Zmax = Z.min(), Z.max()
         print(Zmin,Zmax)

         0.010624918391043181 0.9947710882093846

In [40]: #9
         Z = np.random.random(30)
         Z

Out[40]: array([0.38366733, 0.56184189, 0.97831034, 0.61540225, 0.89969587,
                0.69445646, 0.30662568, 0.37018573, 0.01643402, 0.01803819,
                0.54939772, 0.41712313, 0.31394845, 0.22804902, 0.3797143 ,
                0.63573231, 0.00268148, 0.09348091, 0.06586454, 0.87414573,
                0.34512717, 0.18713669, 0.00838441, 0.71639823, 0.82709845,
                0.68033511, 0.32434585, 0.42086297, 0.05080912, 0.44251461])
```

In [41]:

```
#10
Z = np.ones((10,10))
Z[1:-1,1:-1] = 0
print(Z)
```

```
[[1. 1. 1. 1. 1. 1. 1. 1. 1. 1.]
 [1. 0. 0. 0. 0. 0. 0. 0. 0. 1.]
 [1. 0. 0. 0. 0. 0. 0. 0. 0. 1.]
 [1. 0. 0. 0. 0. 0. 0. 0. 0. 1.]
 [1. 0. 0. 0. 0. 0. 0. 0. 0. 1.]
 [1. 0. 0. 0. 0. 0. 0. 0. 0. 1.]
 [1. 0. 0. 0. 0. 0. 0. 0. 0. 1.]
 [1. 0. 0. 0. 0. 0. 0. 0. 0. 1.]
 [1. 0. 0. 0. 0. 0. 0. 0. 0. 1.]
 [1. 1. 1. 1. 1. 1. 1. 1. 1. 1.]]
```

In [42]:

```
#11
Z = np.ones((5,5))
Z = np.pad(Z, pad_width=1, mode='constant', constant_values=0)
Z
```

Out[42]:

```
array([[0., 0., 0., 0., 0., 0., 0.],
       [0., 1., 1., 1., 1., 1., 0.],
       [0., 1., 1., 1., 1., 1., 0.],
       [0., 1., 1., 1., 1., 1., 0.],
       [0., 1., 1., 1., 1., 1., 0.],
       [0., 1., 1., 1., 1., 1., 0.],
       [0., 0., 0., 0., 0., 0., 0.]])
```

In [44]:

```
#12
Z = np.dot(np.ones((5,3)), np.ones((3,2)))
Z
```

Out[44]:

```
array([[3., 3.],
       [3., 3.],
       [3., 3.],
       [3., 3.],
       [3., 3.]])
```

In [47]:

```
#13
Z = np.arange(11)
Z[(3 < Z) & (Z <= 8)] *= -1
Z
```

Out[47]:

```
array([ 0,  1,  2,  3, -4, -5, -6, -7, -8,  9, 10])
```

In [48]:

```
#14
Z1 = np.random.randint(0,10,10)
Z2 = np.random.randint(0,10,10)
print(np.intersect1d(Z1,Z2))
```

```
[5 6 7]
```

In [50]:

```
#15
yesterday = np.datetime64('today', 'D') - np.timedelta64(1, 'D')
today     = np.datetime64('today', 'D')
tomorrow  = np.datetime64('today', 'D') + np.timedelta64(1, 'D')
print(yesterday,today,tomorrow)
```

```
2021-06-06 2021-06-07 2021-06-08
```

In [52]:

```
#16
Z = np.arange('2016-07', '2016-08', dtype='datetime64[D]')
print(Z)
```

```
['2016-07-01' '2016-07-02' '2016-07-03' '2016-07-04' '2016-07-05'
 '2016-07-06' '2016-07-07' '2016-07-08' '2016-07-09' '2016-07-10'
 '2016-07-11' '2016-07-12' '2016-07-13' '2016-07-14' '2016-07-15'
 '2016-07-16' '2016-07-17' '2016-07-18' '2016-07-19' '2016-07-20'
 '2016-07-21' '2016-07-22' '2016-07-23' '2016-07-24' '2016-07-25'
 '2016-07-26' '2016-07-27' '2016-07-28' '2016-07-29' '2016-07-30'
 '2016-07-31']
```

In [53]:

```
#17
A = np.random.randint(0,2,5)
B = np.random.randint(0,2,5)
# Assuming identical shape of the arrays and a tolerance for the comparison of values
equal = np.allclose(A,B)
print(equal)
```

```
False
```

In [55]:

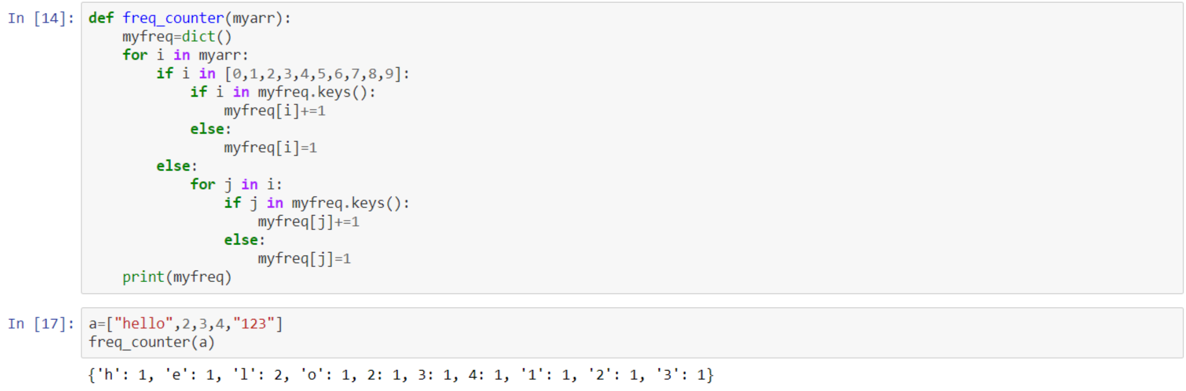
```
#18
Z = np.random.random(10)
Z[Z.argmax()] = 0
Z
```

Out[55]:

```
array([0.43202799, 0.74332615, 0.6528523 , 0.07396282, 0.05602497,
       0.67478853, 0.        , 0.80152456, 0.71991126, 0.76529702])
```

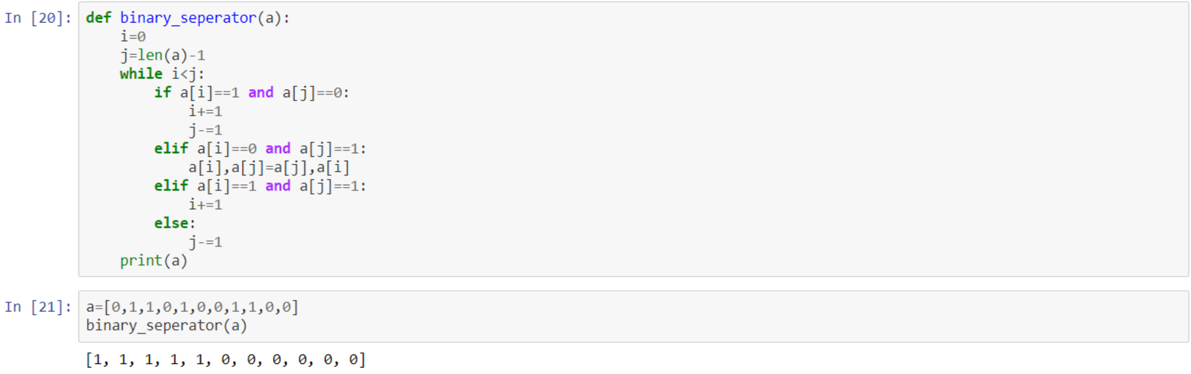
PRACTICE QUESTIONS

Q1)



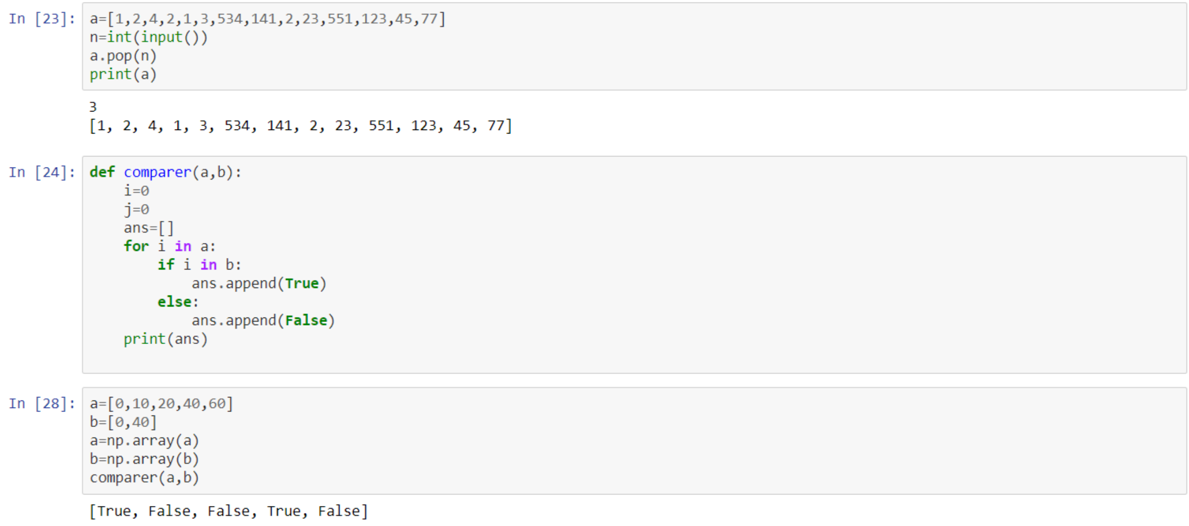
```
In [14]: def freq_counter(myarr):
             myfreq=dict()
             for i in myarr:
                 if i in [0,1,2,3,4,5,6,7,8,9]:
                     if i in myfreq.keys():
                         myfreq[i]+=1
                     else:
                         myfreq[i]=1
                 else:
                     for j in i:
                         if j in myfreq.keys():
                             myfreq[j]+=1
                         else:
                             myfreq[j]=1
             print(myfreq)

In [17]: a=["hello",2,3,4,"123"]
         freq_counter(a)

         {'h': 1, 'e': 1, 'l': 2, 'o': 1, 2: 1, 3: 1, 4: 1, '1': 1, '2': 1, '3': 1}
```

Q2)



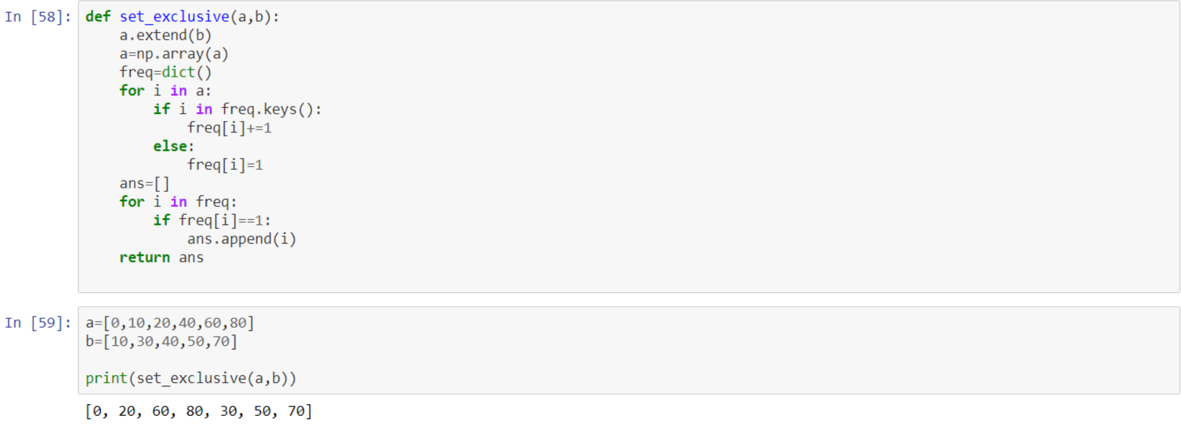
```
In [20]: def binary_seperator(a):
             i=0
             j=len(a)-1
             while i<j:
                 if a[i]==1 and a[j]==0:
                     i+=1
                     j-=1
                 elif a[i]==0 and a[j]==1:
                     a[i],a[j]=a[j],a[i]
                 elif a[i]==1 and a[j]==1:
                     i+=1
                 else:
                     j-=1
             print(a)

In [21]: a=[0,1,1,0,1,0,0,1,1,0,0]
         binary_seperator(a)

         [1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0]
```

Q3, 4)



```
In [23]: a=[1,2,4,2,1,3,534,141,2,23,551,123,45,77]
         n=int(input())
         a.pop(n)
         print(a)

         3
         [1, 2, 4, 1, 3, 534, 141, 2, 23, 551, 123, 45, 77]

In [24]: def comparer(a,b):
             i=0
             j=0
             ans=[]
             for i in a:
                 if i in b:
                     ans.append(True)
                 else:
                     ans.append(False)
             print(ans)

In [28]: a=[0,10,20,40,60]
         b=[0,40]
         a=np.array(a)
         b=np.array(b)
         comparer(a,b)

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

Q4)



```
In [58]: def set_exclusive(a,b):
             a.extend(b)
             a=np.array(a)
             freq=dict()
             for i in a:
                 if i in freq.keys():
                     freq[i]+=1
                 else:
                     freq[i]=1
             ans=[]
             for i in freq:
                 if freq[i]==1:
                     ans.append(i)
             return ans
```

```
In [59]: a=[0,10,20,40,60,80]
         b=[10,30,40,50,70]

         print(set_exclusive(a,b))
```

```
[0, 20, 60, 80, 30, 50, 70]
```