

DS Lab Week #3

Angad Sandhu
190905494
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solved questions

s1)

```
s1.py x
Week 3 > solved > s1.py > ...
1 import numpy as np
2
3 a = np.array([[1, 2], [4, 5]])
4 print(a.dtype)

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

190905494@V310Z-000:~/Documents/DS/Week 3/solved$ python3 s1.py
int64
190905494@V310Z-000:~/Documents/DS/Week 3/solved$
```

s2)

```
s2.py x
Week 3 > solved > s2.py
1 import numpy as np
2
3 print(np.zeros((2, 4)))
4

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

190905494@V310Z-000:~/Documents/DS/Week 3/solved$ python3 s2.py
[[0. 0. 0. 0.]
 [0. 0. 0. 0.]]
190905494@V310Z-000:~/Documents/DS/Week 3/solved$
```

s3)

```
s3.py x
Week 3 > solved > s3.py
1 import numpy as np
2
3 print(np.arange(10, 30, 5))
4

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

190905494@V310Z-000:~/Documents/DS/Week 3/solved$ python3 s3.py
[10 15 20 25]
190905494@V310Z-000:~/Documents/DS/Week 3/solved$
```

s4)

```
s4.py x
Week 3 > solved > s4.py
1 import numpy as np
2
3 print(np.linspace(0, 2, 9))
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
190905494@V310Z-000:~/Documents/DS/Week 3/solved$ python3 s4.py
[0.  0.25 0.5  0.75 1.   1.25 1.5  1.75 2. ]
190905494@V310Z-000:~/Documents/DS/Week 3/solved$
```

s5)

```
s5.py x
Week 3 > solved > s5.py
4 import random
5 print(random.choice([1, 2, 3]))
6 print(random.choice("python"))
7 print(random.randrange(25, 50))
8 print(random.randrange(25, 50, 2))
9 print(random.random())
10 print(random.uniform(5, 10))
11 print(random.shuffle([1, 2, 3, 4, 5]))
12 print(random.seed(10))
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
190905494@V310Z-000:~/Documents/DS/Week 3/solved$ python3 s5.py
3
0
47
29
0.14098237120085544
7.620113233330522
None
None
190905494@V310Z-000:~/Documents/DS/Week 3/solved$
```

s6)

```
s6.py ×
Week 3 > solved > s6.py > ...
1 import numpy as np
2
3 b = np.array([[1, 2], [4, 5]])
4 print(b.shape)
5 print(b.size)
6 print(b.T)
7

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
190905494@V310Z-000:~/Documents/DS/Week 3/solved$ python3 s6.py
(2, 2)
4
[[1 4]
 [2 5]]
190905494@V310Z-000:~/Documents/DS/Week 3/solved$
```

s7)

```
s6.py s7.py ×
Week 3 > solved > s7.py > ...
1 import numpy as np
2
3 c = np.arange(24).reshape(2, 3, 4)
4 print(c)
5

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
190905494@V310Z-000:~/Documents/DS/Week 3/solved$ python3 s7.py
[[[ 0  1  2  3]
 [ 4  5  6  7]
 [ 8  9 10 11]]

 [[12 13 14 15]
 [16 17 18 19]
 [20 21 22 23]]]
190905494@V310Z-000:~/Documents/DS/Week 3/solved$
```

s8)

```
s8.py x
Week 3 > solved > s8.py > ...
1  import numpy as np
2
3  d = np.array([[1, 2], [4, 5]])
4  e = np.array([[1, 2], [4, 5]])
5  print(d - e)
6  print(d**2)
7  print(10 * np.sin(d))
8  print(e < 3)
9
10 f = np.array([[1, 2], [4, 5]])
11 g = np.array([[1, 2], [4, 5]])
12 print(f*g)
13 print(f.dot(g))
14 print(f.sum(axis=0))
15
16 h = np.array([[1, 2], [4, 5]])
17 print(h[1:2])
18 print(h[1][0])
19 print(h[0:1:2])
20 print(h[0:-1])

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL
190905494@V310Z-000:~/Documents/DS/Week 3/solved$ python3 s8.py
[[0 0]
 [0 0]]
[[ 1  4]
 [16 25]]
[[ 8.41470985  9.09297427]
 [-7.56802495 -9.58924275]]
[[ True  True]
 [False False]]
[[ 1  4]
 [16 25]]
[[ 9 12]
 [24 33]]
[5 7]
[[4 5]]
4
[[1 2]]
[[1 2]]
190905494@V310Z-000:~/Documents/DS/Week 3/solved$
```

s9)

```
s9.py x
Week 3 > solved > s9.py > ...
1  import numpy as np
2
3  i = np.array([[1, 2], [4, 5]])
4  j = np.array([[1, 2], [4, 5]])
5  print(i.reshape(4, 1))
6  print(np.vstack((i, j)))
7  print(np.hstack((i, j)))
8

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

190905494@V310Z-000:~/Documents/DS/Week 3/solved$ python3 s9.py
[[1]
 [2]
 [4]
 [5]]
[[1 2]
 [4 5]]
[[1 2]
 [4 5]]
[[1 2 1 2]
 [4 5 4 5]]
190905494@V310Z-000:~/Documents/DS/Week 3/solved$
```

s10)

```
s10.py x s11.py
Week 3 > solved > s10.py > ...
1  import numpy as np
2
3  k = np.array([[1, 2], [4, 5]])
4  sum = 0
5
6  for i in k:
7      for j in i:
8          sum += j
9  print(sum)
10

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

190905494@V310Z-000:~/Documents/DS/Week 3/solved$ python3 s10.py
12
190905494@V310Z-000:~/Documents/DS/Week 3/solved$
```

s11)

```
s11.py x
Week 3 > solved > s11.py > ...
1  import numpy as np
2
3  k = np.array([[1, 2], [4, 5]])
4  sum = 0
5
6  for i in range(k.shape[0]):
7      for j in range(k.shape[0]):
8          sum += k[i, j]
9  print(sum)
10

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL
190905494@V310Z-000:~/Documents/DS/Week 3/solved$ python3 s11.py
12
190905494@V310Z-000:~/Documents/DS/Week 3/solved$
```

exersize questions

Q1)

```
q1.py x
Week 3 > q1.py > num
1  num = int(input("Enter a number : "))
2
3  print("\nFactors of " +str(num)+ " are: ")
4  for i in range(1, num+1):
5      if num % i == 0:
6          print(i,end = " ")
7  print()

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL
190905494@V310Z-000:~/Documents/DS/Week 3$ python3 q1.py
Enter a number : 8

Factors of 8 are:
1 2 4 8
190905494@V310Z-000:~/Documents/DS/Week 3$
```

Q2)

```
q2.py x
Week 3 > q2.py > ...
1 import pandas as pd
2
3
4 df = pd.DataFrame({'a': [10,20], 'b': [100,200]})
5
6 df.loc['Column_Total'] = df.sum(numeric_only=True, axis=0)
7 df.loc[:, 'Row_Total'] = df.sum(numeric_only=True, axis=1)
8
9 print(df)
10
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
190905494@V310Z-000:~/Documents/DS/Week 3$ python3 q2.py
      a    b  Row_Total
0     10  100         110
1     20  200         220
Column_Total  30  300         330
190905494@V310Z-000:~/Documents/DS/Week 3$
```


Q3)

```
q3.py  X
Week 3 > q3.py > ...
1  import numpy as np
2
3  # a
4  initialArray = ["1.1", "2.2", "3.3", "4.4"]
5  sampleArray = np.array(initialArray)
6  convertedArray = sampleArray.astype(np.float)
7  print("Our final array: ", str(convertedArray))
8  print("Final type: " + str(type(convertedArray[0])))
9
10 # b
11 tup = (11, 21, 19, 18, 46, 29)
12 arr = np.asarray(tup)
13 print(arr)
14
15 # c
16 b = np.zeros([3, 4], dtype = int)
17 print("\nMatrix b : \n", b)
18 print()
19
20 # d
21 for i in range(0,20,5):
22     print(i, end=" ")
23 print()
24
25 # e
26 arr = np.ones([3, 4])
27 arr = arr[:, :, np.newaxis]
28 print(arr.shape)
29 new = np.reshape(arr, (2, 2, 3))
30 print(new.shape)
31
```

```
32 # f
33 lst = np.array([[1, 2, 3], [4, 5, 6], [7, 8, 9]])
34
35 print("\nMAX : \n", lst.max())
36 print(lst.max(axis=0))
37 print(lst.max(axis=1))
38
39 print("\nMIN : \n", lst.min())
40 print(lst.min(axis=0))
41 print(lst.min(axis=1))
42
43 print("\nSUM : \n", lst.sum())
44 print(lst.sum(axis=0))
45 print(lst.sum(axis=1))
46
47
```



```

190905494@V310Z-000:~/Documents/DS/Week 3$ python3 q3.py
Our final array: [1.1 2.2 3.3 4.4]
Final type: <class 'numpy.float64'>
[11 21 19 18 46 29]

Matrix b :
[[0 0 0 0]
 [0 0 0 0]
 [0 0 0 0]]

0 5 10 15
(3, 4, 1)
(2, 2, 3)

MAX :
9
[7 8 9]
[3 6 9]

MIN :
1
[1 2 3]
[1 4 7]

SUM :
45
[12 15 18]
[ 6 15 24]
190905494@V310Z-000:~/Documents/DS/Week 3$ █

```

Q4)

```

q4.py x
Week 3 > q4.py > ...
1  import numpy as np
2
3  arr = np.array([[1, 2, 3], [4, 5, 6]])
4
5  print("Numpy array :")
6  print(arr)
7  print
8  print("Transposed array : ")
9  print(arr.T)

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL
190905494@V310Z-000:~/Documents/DS/Week 3$ python3 q4.py
Numpy array :
[[1 2 3]
 [4 5 6]]
Transposed array :
[[1 4]
 [2 5]
 [3 6]]
190905494@V310Z-000:~/Documents/DS/Week 3$ █

```

Q5)

```
q5.py x
Week 3 > q5.py > ...
1 import numpy as np
2
3 a = np.array([[1, 2], [4, 5]])
4 b = np.array([[1, 2], [4, 5]])
5
6 print("Numpy arrays :")
7 print(a)
8 print
9 print(b)
10 print
11 print("Added array : ")
12 print(a+b)

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
190905494@V310Z-000:~/Documents/DS/Week 3$ python3 q5.py
Numpy arrays :
[[1 2]
 [4 5]]
[[1 2]
 [4 5]]
Added array :
[[ 2  4]
 [ 8 10]]
190905494@V310Z-000:~/Documents/DS/Week 3$
```

Q6)

```
q6.py x
Week 3 > q6.py > ...
1 import numpy as np
2
3 a = np.array([[1, 2], [4, 5]])
4 b = np.array([[1, 2], [4, 5]])
5
6 print("Numpy arrays :")
7 print(a)
8 print(b)
9 print("\nElement-wise multiplied array : ")
10 print(a*b)

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
190905494@V310Z-000:~/Documents/DS/Week 3$ python3 q6.py
Numpy arrays :
[[1 2]
 [4 5]]
[[1 2]
 [4 5]]

Element-wise multiplied array :
[[ 1  4]
 [16 25]]
190905494@V310Z-000:~/Documents/DS/Week 3$
```