Numpy_Assignment_2::

Question:1

Convert a 1D array to a 2D array with 2 rows?

Desired output::

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

```
In [4]: import numpy as np
```

```
In [5]: array = np.arange(0,10)
        print(array)
```

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

```
In [6]: array.reshape(2,5)
```

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

Question:2

How to stack two arrays vertically?

Desired Output::

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

```
In [8]: import numpy as np
```

```
In [12]: array1 = np.arange(10)
         array2 = array1.reshape(2,5)
         print(array2)
```

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

```
In [21]: array3 = np.ones(10, dtype = int)
         array4 = array3.reshape(2,5)
         print(array4)
```

```
[[1 1 1 1 1]
 [1 1 1 1 1]]
```

In [22]:
```
print(array2,array4)
np.vstack((array2,array4))
```

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

Out[22]:
```
array([[0, 1, 2, 3, 4],
       [5, 6, 7, 8, 9],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1]])
```

Question:3

In [ ]:
```
```

How to stack two arrays horizontally?

Desired Output::

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

In [23]:
```
import numpy as np
```

In [24]:
```
array1 = np.arange(0,10)
array2 = array1.reshape(2,5)
array3 = np.ones(10 , dtype = int)
array4 = array3.reshape(2,5)
print(array2,array4)
np.hstack((array2,array4))
```

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

Out[24]:
```
array([[0, 1, 2, 3, 4, 1, 1, 1, 1, 1],
       [5, 6, 7, 8, 9, 1, 1, 1, 1, 1]])
```

Question:4

In [ ]:
```
```

How to convert an array of arrays into a flat 1d array?

Desired Output::

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

In [25]:
```
import numpy as np
```

In [26]:
```
array2 = np.array([[0,1,2,3,4],[5,6,7,8,9]])
print(array2)
array2.flatten()
```

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

Out[26]:
```
array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])
```

Question:5

How to Convert higher dimension into one dimension?

Desired Output::

array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14])

In [3]:
```
import numpy as np
```

In [5]:
```
array1 = np.asarray([[0,1,2,3,4],[5,6,7,8,9]])
array1.ravel()
```

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

Question:6

Convert one dimension to higher dimension?

Desired Output::

array([[0, 1, 2], [3, 4, 5], [6, 7, 8], [9, 10, 11], [12, 13, 14]])

In [30]:
```
import numpy as np
```

In [31]:
```
array1 = np.arange(15)
array2 = array1.reshape(-1,3)
print(array2)
```

```
[[ 0  1  2]
 [ 3  4  5]
 [ 6  7  8]
 [ 9 10 11]
 [12 13 14]]
```

Question:7

Create 5x5 an array and find the square of an array?

In [32]:
```
import numpy as np
```

In [33]:
```
array1 = np.arange(25)
array2 = array1.reshape(5,5)
print(array2)
np.square(array2)
```

```
[[ 0  1  2  3  4]
 [ 5  6  7  8  9]
 [10 11 12 13 14]
 [15 16 17 18 19]
 [20 21 22 23 24]]
```

Out[33]:
```
array([[  0,   1,   4,   9,  16],
       [ 25,  36,  49,  64,  81],
       [100, 121, 144, 169, 196],
       [225, 256, 289, 324, 361],
       [400, 441, 484, 529, 576]], dtype=int32)
```

Question:8

Create 5x6 an array and find the mean?

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

In [34]:
```
np.random.seed(789)
array1=np.random.randint(30, size= (5,6))
print(array1)
array1.mean()
```

```
[[19 14 18  1 12 26]
 [ 3 20 24 27 20 17]
 [ 8 16  1  1 25 24]
 [25 15  4  1  4 17]
 [ 3 24  1 20 25  6]]
```

Out[34]:
```
14.033333333333333
```

Question:9

Find the standard deviation of the previous array in Q8?

In [35]:
```
import numpy as np
```

In [36]:
```
np.random.seed(789)
array1=np.random.randint(30, size= (5,6))
print(array1)
```

```
[[19 14 18  1 12 26]
```

```
[[19 14 18  1 12 26]
 [ 3 20 24 27 20 17]
 [ 8 16  1  1 25 24]
 [25 15  4  1  4 17]
 [ 3 24  1 20 25  6]]
```

In [37]:
```
np.std(array1)
```

Out[37]: 9.199577284974685

Question:10

Find the median of the previous array in Q8?

In [38]:
```
import numpy as np
```

In [39]:
```
np.random.seed(789)
array1=np.random.randint(30, size= (5,6))
print(array1)
```

```
[[19 14 18  1 12 26]
 [ 3 20 24 27 20 17]
 [ 8 16  1  1 25 24]
 [25 15  4  1  4 17]
 [ 3 24  1 20 25  6]]
```

In [40]:
```
np.median(array1)
```

Out[40]: 16.5

Question:11

Find the transpose of the previous array in Q8?

In [41]:
```
import numpy as np
```

In [42]:
```
np.random.seed(789)
array1=np.random.randint(30, size= (5,6))
print(array1)
```

```
[[19 14 18  1 12 26]
 [ 3 20 24 27 20 17]
 [ 8 16  1  1 25 24]
 [25 15  4  1  4 17]
 [ 3 24  1 20 25  6]]
```

In [44]:
```
array1.T
```

Out[44]:
```
array([[19,  3,  8, 25,  3],
       [14, 20, 16, 15, 24],
       [18, 24,  1,  4,  1],
```

```
[ 1, 27,  1,  1, 20],
[12, 20, 25,  4, 25],
[26, 17, 24, 17,  6]])
```

Question:12

Create a 4x4 an array and find the sum of diagonal elements?

In [46]:
```
import numpy as np
```

In [49]:
```
array1 = np.arange(16)
array2 = array1.reshape(4,4)
print(array2)
```

```
[[ 0  1  2  3]
 [ 4  5  6  7]
 [ 8  9 10 11]
 [12 13 14 15]]
```

In [51]:
```
np.diagonal(array2)
```

Out[51]:
```
array([ 0,  5, 10, 15])
```

Question:13

Find the determinant of the previous array in Q12?

In [53]:
```
import numpy as np
```

In [55]:
```
array1 = np.arange(16)
array2 = array1.reshape(4,4)
print(array2)
```

```
[[ 0  1  2  3]
 [ 4  5  6  7]
 [ 8  9 10 11]
 [12 13 14 15]]
```

In [54]:
```
np.linalg.det(array2)
```

Out[54]:
```
0.0
```

Question:14

Find the 5th and 95th percentile of an array?

In [56]:
```
import numpy as np
```

In [61]:
```
array= np.arange(10)
print(array)
```

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

In [62]:
```
print(np.percentile(array,5)  )
print(np.percentile(array,95) )
```

```
0.45
8.549999999999999
```

Question:15

How to find if a given array has any null values?

In [63]:
```
import numpy as np
```