

1. Import numpy as np and print the version number.
2. Create a 1D array of numbers from 0 to 9.
3. Create a 3×3 numpy array of all True's.

```
arr = np.array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])
```

4. Extract all odd numbers from arr.
5. Replace all odd numbers in arr with -1.
6. Replace all odd numbers in arr with -1 without changing arr. (where function)

```
np.arange(10)
```

7. Convert a 1D array to a 2D array with 2 rows.

```
a = np.arange(10).reshape(2,-1)
b = np.repeat(1, 10).reshape(2,-1)
```

8. Stack arrays a and b vertically.
9. Stack the arrays a and b horizontally.
10. Create the following pattern without hardcoding. Use only numpy functions and the below input array a. (np.repeat, np.tile)

```
a = np.array([1,2,3])
#> array([1, 1, 1, 2, 2, 2, 3, 3, 3, 1, 2, 3, 1, 2, 3, 1, 2, 3])
```

11. Get the common items between a and b.

```
a = np.array([1,2,3,2,3,4,3,4,5,6])
b = np.array([7,2,10,2,7,4,9,4,9,8])
```

12. From array a remove all items present in array b.

```
a = np.array([1,2,3,4,5])
b = np.array([5,6,7,8,9])
```

13. Get the positions where elements of a and b match.

```
a = np.array([1,2,3,2,3,4,3,4,5,6])
b = np.array([7,2,10,2,7,4,9,4,9,8])
```

14. Get all items between 5 and 10 from a.

```
a = np.array([2, 6, 1, 9, 10, 3, 27])
```

15. Swap columns 1 and 2 in the array arr.

```
arr = np.arange(9).reshape(3,3)
```

16. Swap rows 1 and 2 in the array arr.
17. Reverse the rows of a 2D array arr.
18. Reverse the columns of a 2D array arr.
19. Create a 2D array of shape 5x3 to contain random decimal numbers between 5 and 10.
20. Print or show only 3 decimal places of the numpy array rand_arr.

```
rand_arr = np.random.random((5,3))
```

21. Pretty print rand_arr by suppressing the scientific notation (like 1e10).
22. Limit the number of items printed in python numpy array a to a maximum of 6 elements.
23. Print the full numpy array a without truncating.

```
np.set_printoptions(threshold=6)
a = np.arange(15)
```

24. Import the [iris dataset](#) keeping the text intact.

```
url = 'https://archive.ics.uci.edu/ml/machine-learning-databases/iris/iris.data'
iris = np.genfromtxt(url, delimiter=',', dtype='object')
names = ('sepallength', 'sepalwidth', 'petallength', 'petalwidth', 'species')
```

25. Extract the text column species from the 1D iris imported in previous question.
26. Convert the 1D iris to 2D array iris_2d by omitting the species text field.
27. Find the mean, median, standard deviation of iris's sepallength (1st column).
28. Create a normalized form of iris's sepallength whose values range exactly between 0 and 1 so that the minimum has value 0 and maximum has value 1.
29. Find the 5th and 95th percentile of iris's sepallength.
30. Insert np.nan values at 20 random positions in iris_2d dataset.
31. Find the number and position of missing values in iris_2d's sepallength.
32. Filter the rows of iris_2d that has petallength (3rd column) > 1.5 and sepallength (1st column) < 5.0.
33. Select the rows of iris_2d that does not have any nan value.
34. Find the correlation between SepalLength(1st column) and PetalLength(3rd column) in iris_2d.
35. Find out if iris_2d has any missing values.
36. Replace all occurrences of nan with 0 in numpy array.
37. Find the unique values and the count of unique values in iris's species.