

NUMPY

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

In [3]: arr = np.array([[1,2,3],[4,5,6]])
print(arr)

[[1 2 3]
 [4 5 6]]

In [4]: #copying array
copy_arr = arr.copy() #copying array
print("Copying array : ",copy_arr)

copy_arr[0][0] = 0
print("After updating copy array ",copy_arr)
print("After updating copy array ",arr)

Copying array :  [[1 2 3]
 [4 5 6]]
After updating copy array  [[0 2 3]
 [4 5 6]]
After updating copy array  [[1 2 3]
 [4 5 6]]

In [6]: #casting
print(arr.dtype)

arr = arr.astype(np.float32)

print("After updating : ",arr.dtype)

int64
After updating :  float32

In [9]: #Ranged data
arr1 = np.arange(10)
print(arr1)

arr2 = np.arange(10.2)
print(arr2)

arr3 = np.arange(-10,10,2)
print(arr3)

[0 1 2 3 4 5 6 7 8 9]
[0. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10.]
[-10 -8 -6 -4 -2 0 2 4 6 8]

In [12]: #linspace - to specify no of elements in output array
arr4 = np.linspace(10,20,num=5)
print(arr4)

arr5 = np.linspace(10,20,num=5,dtype=np.int32)
print(arr5)

[10. 12.5 15. 17.5 20. ]
[10 12 15 17 20]

In [16]: #shape
print(arr.shape)

#Reshape
arr6 = np.reshape(arr,(3,2))
print("Reshaped array ",arr6)

(2, 3)
Reshaped array  [[1. 2.]
 [3. 4.]
 [5. 6.]]

In [17]: #flatten - to convert to 1D array
arr7 = arr6.flatten()
print(arr7)

[1. 2. 3. 4. 5. 6.]

In [18]: #Transpose
arr8 = arr6.transpose()
print(arr8)

[[1. 3. 5.]
 [2. 4. 6.]]

In [20]: #zeros and ones
arr9 = np.zeros(4)
print(arr9)

arr10 = np.ones((3,4))
print(arr10)

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

In [22]: #Matrix multiplication
arr11 = np.matmul(arr,arr10)
print(arr11)

[[ 6. 6. 6. 6.]
 [15. 15. 15. 15]]

In [24]: #Random
print(np.random.randint(30))

9

In [26]: #Mathematical Functions
print("Maximum : ",arr.max())
print("Minimum : ",arr.min())

print("Maximum in each column : ",arr.max(axis=0))
print("Minimum in each row : ",arr.min(axis=1))

Maximum :  6.0
Minimum :  1.0
Maximum in each column :  [4. 5. 6.]
Minimum in each row :  [1. 4.]

In [27]: #Statistical methods
print("Mean : ",np.mean(arr))
print("Median : ",np.median(arr))
print("Variance : ",np.var(arr))

Mean :  3.5
Median :  3.5
Variance : 2.9166667
```

PANDAS

```
In [28]: import pandas as pd

In [30]: dict_1={"car":["city","ignis","800","Verna","Venue","Punto"],"brand":["Honda","maruti","Maru
ti"],"Hyundia","Hyundai","Fiat"],
"cost": [900000, 600000, 100000, 800000, 950000, 750000], "year": [5, 7, 10, 4, 2, 6]}
print(dict_1)

{'car': ['city', 'ignis', '800', 'Verna', 'Venue', 'Punto'], 'brand': ['Honda', 'maruti', 'Ma
ruti', 'Hyundia', 'Hyundai', 'Fiat'], 'cost': [900000, 600000, 100000, 800000, 950000, 7500
0], 'year': [5, 7, 10, 4, 2, 6]}

In [35]: df = pd.DataFrame(dict_1)
df

Out[35]:
   car  brand  cost  year
0  city  Honda  900000    5
1  ignis  maruti  600000    7
2   800  Maruti  100000   10
3  Verna  Hyundia  800000    4
4  Venue  Hyundai  950000    2
5  Punto   Fiat  750000    6

In [38]: data = pd.read_csv("netflix_titles.csv")
data.head()

Out[38]:
   show_id  type  title  director  cast  country  date_added  release_year  rating  duration  listed_in_descri
0         s1  Movie  Dick Johnson Is Dead  Kirsten Johnson  NaN  United States  September 25, 2021  2020  PG-13  90 min  Documentaries  father the e
1         s2  TV Show  Blood & Water  NaN  Ama Qamata, Khosi Ngema, Gail Mababane, Thabani...  South Africa  September 24, 2021  2021  TV-MA  Seasons  2  International TV Shows, TV Dramas, TV Mysteries  cros pathe
2         s3  TV Show  Ganglands  Julien Leclercq  Sami Bouajila, Tracy Golioas, Samuel Jooy, Nabil...  NaN  September 24, 2021  2021  TV-MA  Season  1  Crime TV Shows, International TV Shows, TV Act...  To pr his f
3         s4  TV Show  Jailbirds New Orleans  NaN  NaN  NaN  September 24, 2021  2021  TV-MA  Season  1  Docuseries, Reality TV  Fc firta and
4         s5  TV Show  Kota Factory  NaN  Mayur More, Jitendra Kumar, Ranjan Raj, Alan K...  India  September 24, 2021  2021  TV-MA  Seasons  2  International TV Shows, TV Horror, TV Romantic TV Shows, TV ...  In a c
In [47]: data.head(10)

Out[47]:
   show_id  type  title  director  cast  country  date_added  release_year  rating  duration  listed_in_de
0         s1  Movie  Dick Johnson Is Dead  Kirsten Johnson  NaN  United States  September 25, 2021  2020  PG-13  90 min  Documentaries  fal
1         s2  TV Show  Blood & Water  NaN  Ama Qamata, Khosi Ngema, Gail Mababane, Thabani...  South Africa  September 24, 2021  2021  TV-MA  Seasons  2  International TV Shows, TV Dramas, TV Mysteries  C
2         s3  TV Show  Ganglands  Julien Leclercq  Sami Bouajila, Tracy Golioas, Samuel Jooy, Nabil...  NaN  September 24, 2021  2021  TV-MA  Season  1  Crime TV Shows, International TV Shows, TV Act...
3         s4  TV Show  Jailbirds New Orleans  NaN  NaN  NaN  September 24, 2021  2021  TV-MA  Season  1  Docuseries, Reality TV
4         s5  TV Show  Kota Factory  NaN  Mayur More, Jitendra Kumar, Ranjan Raj, Alan K...  India  September 24, 2021  2021  TV-MA  Seasons  2  International TV Shows, TV Horror, TV Romantic TV Shows, TV ...
5         s6  TV Show  Midnight Mass  Mike Flanagan  Kate Siegel, Zach Gilford, Hamish Linklater, H...  NaN  September 24, 2021  2021  TV-MA  Season  1  TV Dramas, TV Horror, TV Mysteries  1
6         s7  Movie  My Little Pony: A New Generation  Robert Cullen, José Luis Ucha  Vanessa Hudgens, Glenm, Chevy Chase, Marsden...  NaN  September 24, 2021  2021  PG  91 min  Children & Family Movies  E
7         s8  Movie  Sankofa  Haile Gerima  Kofi Channab, Oyulumeke Ogunlana, Alexandra D...  United States, Ghana, Burkina Faso, United Kin...  September 24, 2021  1993  TV-MA  125 min  Dramas, Independent Movies, International Movies  C
8         s9  TV Show  The Great British Baking Show  Andy Devonshire  Mel Giedroyc, Sue Perkins, Mary Berry, Paul Ho...  United Kingdom  September 24, 2021  2021  TV-14  Seasons  9  British TV Shows, Reality TV  ,
9         s10  Movie  The Stairing  Theodore Mell  Melissa McCarthy, Chris O'Dowd, Kevin Kline, T...  United States  September 24, 2021  2021  PG-13  104 min  Comedies, Dramas  BK
In [39]: data.tail()

Out[39]:
   show_id  type  title  director  cast  country  date_added  release_year  rating  duration  listed_in_des
8802      s803  Movie  Zodiac  David Fincher  Mark Ruffalo, Jake Gyllenhaal, Robert Downey J...  United States  November 20, 2019  2007  R  158 min  Cult Movies, Thrillers  a
8803      s804  TV Show  Zombie Dumb  NaN  NaN  NaN  July 1, 2019  2018  TV-Y7  Seasons  2  Kids' TV Shows, TV Dramas, TV Comedies  wh
8804      s805  Movie  Zombieland  Ruben Fleischer  Jesse Eisenberg, Woody from Toy Story, Emma Stone,...  United States  November 1, 2019  2009  R  88 min  Comedies, Horror Movies  Lo
8805      s806  Movie  Zoom  Peter Hewitt  Tim Allen, Courtney Cox, Chevy Chase, Kate Ma...  United States  January 11, 2020  2006  PG  88 min  Children & Family Movies, Comedies  f
8806      s807  Movie  Zubaan  Mozez Singh  Vidya Kaushal, Sarah-Jane Dias, Raaghav Chanan...  India  March 2, 2019  2015  TV-14  111 min  Dramas, International Movies, Music & Musicals  i
In [40]: data.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 8807 entries, 0 to 8806
Data columns (total 12 columns):
 #   Column                Non-Null Count  Dtype
---  --
 0  show_id                8807 non-null    object
 1  type                  8807 non-null    object
 2  title                 8807 non-null    object
 3  director              6173 non-null    object
 4  cast                  7982 non-null    object
 5  country               7978 non-null    object
 6  date_added            8797 non-null    object
 7  release_year          8807 non-null    int64
 8  rating                8803 non-null    object
 9  duration              8804 non-null    object
10  listed_in             8807 non-null    object
11  description            8807 non-null    object
dtypes: int64(1), object(11)
memory usage: 825.8+ KB

In [41]: data.shape

Out[41]: (8807, 12)

In [42]: data.columns

Out[42]: Index(['show_id', 'type', 'title', 'director', 'cast', 'country', 'date_added', 'release_year', 'rating', 'duration', 'listed_in', 'description'], dtype='object')

In [43]: data['rating'].unique()

Out[43]: array(['PG-13', 'TV-MA', 'PG', 'TV-14', 'TV-PG', 'TV-Y', 'TV-Y7', 'TV-Y7-FV', 'R', 'TV-G', 'G', 'NC-17', '74 min', '84 min', '86 min', 'NR', nan, 'TV-Y7-FV', 'UR'], dtype=object)

In [44]: data['country'].value_counts()

Out[44]:
United States    2818
India             972
United Kingdom   419
Japan             245
South Korea      199
Romania, Bulgaria, Hungary    1
Uruguay, Guatemala    1
France, Senegal, Belgium    1
Mexico, United States, Spain, Colombia    1
United Arab Emirates, Jordan    1
Name: country, Length: 748, dtype: int64

In [45]: data['title']

Out[45]:
0      Dick Johnson Is Dead
1      Blood & Water
2      Ganglands
3      Jailbirds New Orleans
4      Kota Factory
...
8802      Zodiac
8803      Zombie Dumb
8804      Zombieland
8805      Zoom
8806      Zubaan
Name: title, Length: 8807, dtype: object

In [46]: data[['title','director']]

Out[46]:
   title  director
0  Dick Johnson Is Dead  Kirsten Johnson
1  Blood & Water  NaN
2  Ganglands  Julien Leclercq
3  Jailbirds New Orleans  NaN
4  Kota Factory  NaN
...
8802  Zodiac  David Fincher
8803  Zombie Dumb  NaN
8804  Zombieland  Ruben Fleischer
8805  Zoom  Peter Hewitt
8806  Zubaan  Mozez Singh

8807 rows x 2 columns

In [49]: filter = data["country"]=="India"
filter

Out[49]:
0      False
1      False
2      False
3      False
4      True
...
8802     False
8803     False
8804     False
8805     False
8806     False
8807     True
Name: country, Length: 8807, dtype: bool

In [51]: data.loc[filter]

Out[51]:
   show_id  type  title  director  cast  country  date_added  release_year  rating  duration  listed_in
4         s5  TV Show  Kota Factory  NaN  Mayur More, Jitendra Kumar, Ranjan Raj, Alan K...  India  September 24, 2021  2021  TV-MA  Seasons  2  International TV Shows, TV Horror, TV Romantic TV Shows, TV ...
24        s25  Movie  Jeans  S. Shankar  Prashanth, Aishwarya Rai Bachchan, Sri Lakshmi...  India  September 21, 2021  1998  TV-14  166 min  Comedies, International Movies
39        s40  TV Show  Chhota Bheem  NaN  Vatsal Dubey, Julie Tejwani, Rupa Bhimani, Jig...  India  September 16, 2021  2021  TV-Y7  Seasons  3  Kids' TV
50        s51  TV Show  Dharmakshetra  NaN  Kashmira Irani, Chandan Ramesh, Dinesh Mehta, A...  India  September 15, 2021  2014  TV-PG  Season  1  International TV Shows, TV Sci-Fi & Fantasy TV Shows
66        s67  TV Show  Raja Rasoi Aur Anya Kahaniyan  NaN  NaN  India  September 15, 2021  2014  TV-G  Season  1  Docuseries, International TV Shows
...  ...  ...  ...  ...  ...  ...  ...  ...  ...  ...  ...
8773      s8774  Movie  Yanda Aithe  Kodar Sridas  Ankoosh Choudhary, Smriti Shewale, Mohan Joshi, ...  India  January 1, 2018  2006  TV-PG  151 min  Comedies, Dramas, International Movies
8775      s8776  TV Show  Yeh Meri Family  NaN  Vivesh Bansal, Mona Singh, Akash Khurana, Ah...  India  August 31, 2018  2018  TV-PG  Season  1  TV Shows, TV Comedies
8798      s8799  Movie  Zed Plus  Chandria Prakash Dawood  Adil Hussain, Mona Singh, K.K. Raina, Sanjay M...  India  December 31, 2019  2014  TV-MA  131 min  Comedies, Dramas, International Movies
8799      s8800  Movie  Zenda  Avadhoot Gupte  Santosh Juvekar, Siddharth Chandekar, Sachin P...  India  February 15, 2018  2009  TV-14  120 min  Dramas, International Movies
8806      s8807  Movie  Zubaan  Mozez Singh  Vidya Kaushal, Sarah-Jane Dias, Raaghav Chanan...  India  March 2, 2019  2015  TV-14  111 min  Dramas, International Movies, Music & Musicals

972 rows x 12 columns

In [60]: df.columns = [x.capitalize() for x in df.columns]
df

Out[60]:
   Car  Brand  Cost  Year
0  city  Honda  900000    5
1  ignis  maruti  600000    7
2   800  Maruti  100000   10
3  Verna  Hyundia  800000    4
4  Venue  Hyundai  950000    2
5  Punto   Fiat  750000    6

In [61]: df.sort_values("Cost")
df

Out[61]:
   Car  Brand  Cost  Year
0  city  Honda  900000    5
1  ignis  maruti  600000    7
2   800  Maruti  100000   10
3  Verna  Hyundia  800000    4
4  Venue  Hyundai  950000    2
5  Punto   Fiat  750000    6

In [63]: groups = data.groupby(["rating"])

In [64]: groups.size()

Out[64]:
rating
66 min    1
74 min    1
84 min    1
G         41
NC-17     3
NR         80
PG        287
PG-13     490
R          799
TV-14    2160
TV-G      220
TV-MA    3287
TV-PG     863
TV-Y      387
TV-Y7     334
TV-Y7-FV  6
UR         3
dtype: int64

In [65]: groups.count()

Out[65]:
   show_id  type  title  director  cast  country  date_added  release_year  duration  listed_in  description
rating
66 min    1  1  1  1  1  1  1  1  1  0  1  1
74 min    1  1  1  1  1  1  1  1  1  0  1  1
84 min    1  1  1  1  1  1  1  1  1  0  1  1
G         41  41  41  41  41  40  41  41  41  0  1  41
NC-17     3  3  3  3  3  3  3  3  3  3  3  3
NR        80  80  80  75  63  80  79  80  80  80  80  80
```

[illegible]