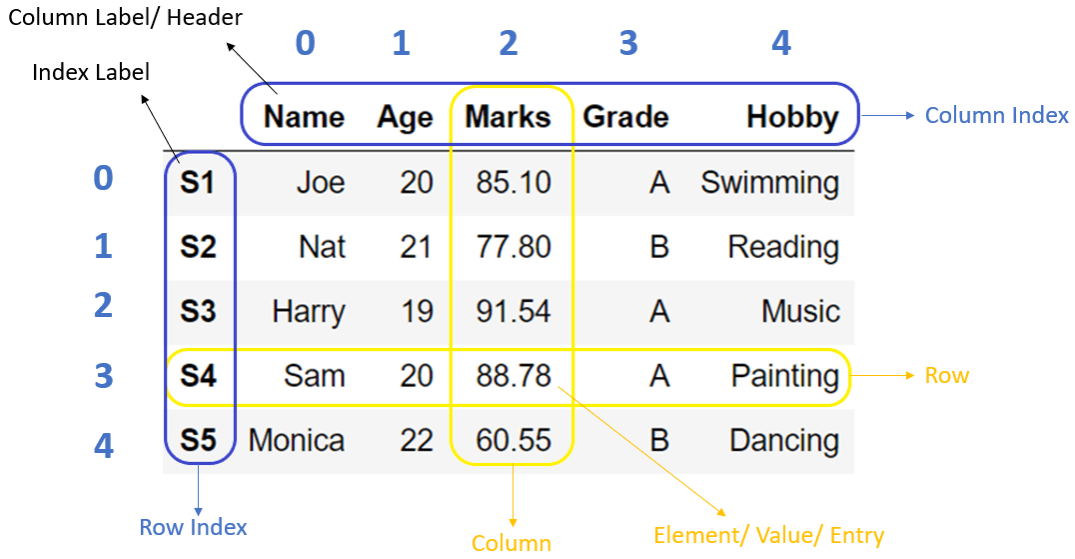
Pandas dataframe

- when data in the form of tables is load in the pandas then pandas will recognise it as a dataframe
- whole table will be called as dataframe
- single row or single column will be called series



In [1]:

```
import numpy as np
import pandas as pd
```

Creating a dataframe

using a list

In [2]:

```
student_data = [
    [100,80,10],
    [90,70,7],
    [120,100,14],
    [80,50,2]
]
student_data
```

Out[2]:

```
[[100, 80, 10], [90, 70, 7], [120, 100, 14], [80, 50, 2]]
```

In [3]:

```
pd.DataFrame(student_data)
# index will be generated automatically
```

Out[3]:

	0	1	2
0	100	80	10
1	90	70	7
2	120	100	14
3	80	50	2

In [4]:

```
pd.DataFrame(student_data,columns=['iq','marks','package'])
```

Out[4]:

	iq	marks	package
0	100	80	10
1	90	70	7
2	120	100	14
3	80	50	2

using dictionary

In [5]:

```
student_dict = {
    'name':['nitish','ankit','rupesh','rishabh','amit','disha'],
    'iq':[100,90,120,80,0,0],
    'marks':[80,70,100,50,0,0],
    'package':[10,7,14,2,0,0]
}

students = pd.DataFrame(student_dict)
students
```

Out[5]:

	name	iq	marks	package
0	nitish	100	80	10
1	ankit	90	70	7
2	rupesh	120	100	14
3	rishabh	80	50	2
4	amit	0	0	0
5	disha	0	0	0

In [6]:

```
students.set_index('name', inplace=True)
students
```

Out[6]:

name	iq	marks	package
nitish	100	80	10
ankit	90	70	7
rupesh	120	100	14
rishabh	80	50	2
amit	0	0	0
disha	0	0	0

using read_csv()

In [7]:

```
movies = pd.read_csv('movies.csv')
movies
```

Out[7]:

	title_x	imdb_id	poster_path	
0	Uri: The Surgical Strike	tt8291224	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/Uri:_The
1	Battalion 609	tt9472208	NaN	https://en.wikipedia.org/wiki/Ba
2	The Accidental Prime Minister (film)	tt6986710	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/The_Acc

In [8]:

```
ipl = pd.read_csv('ipl-matches.csv')
ipl
```

Out[8]:

	ID	City	Date	Season	MatchNumber	Team1	Team2	Venue	TossWinn
0	1312200	Ahmedabad	2022-05-29	2022	Final	Rajasthan Royals	Gujarat Titans	Narendra Modi Stadium, Ahmedabad	Rajasth Roya
1	1312199	Ahmedabad	2022-05-27	2022	Qualifier 2	Royal Challengers Bangalore	Rajasthan Royals	Narendra Modi Stadium, Ahmedabad	Rajasth Roya
2	1312198	Kolkata	2022-05-25	2022	Eliminator	Royal Challengers Bangalore	Lucknow Super Giants	Eden Gardens, Kolkata	Luckn Sup Giar
			2022-			Rajasthan	Gujarat	Eden	Guja

DataFrame Attributes and Methods

shape

In [9]:

```
movies.shape
# returns in tuple form
```

Out[9]:

```
(1629, 18)
```

In [10]:

```
ipl.shape
```

Out[10]:

```
(950, 20)
```

dtypes

In [11]:

```
movies.dtypes
# here you will get whole series for each attribute
```

Out[11]:

```
title_x              object
imdb_id              object
poster_path          object
wiki_link            object
title_y              object
original_title       object
is_adult              int64
year_of_release       int64
runtime              object
genres               object
imdb_rating         float64
imdb_votes            int64
story                object
summary              object
tagline              object
actors               object
wins_nominations     object
release_date         object
dtype: object
```

In [12]:

```
ipl.dtypes
```

Out[12]:

```
ID                  int64
City               object
Date               object
Season             object
MatchNumber        object
Team1              object
Team2              object
Venue              object
TossWinner         object
TossDecision       object
SuperOver          object
WinningTeam        object
WonBy              object
Margin            float64
method             object
Player_of_Match    object
Team1Players       object
Team2Players       object
```

index

In [13]:

```
1 movies.index
```

Out[13]:

```
RangeIndex(start=0, stop=1629, step=1)
```

In [14]:

```
1 ipl.index
```

Out[14]:

```
RangeIndex(start=0, stop=950, step=1)
```

columns

In [15]:

```
1 movies.columns
```

Out[15]:

```
Index(['title_x', 'imdb_id', 'poster_path', 'wiki_link', 'title_y',
       'original_title', 'is_adult', 'year_of_release', 'runtime', 'genre
s',
       'imdb_rating', 'imdb_votes', 'story', 'summary', 'tagline', 'actor
s',
       'wins_nominations', 'release_date'],
      dtype='object')
```

In [16]:

```
1 ipl.columns
```

Out[16]:

```
Index(['ID', 'City', 'Date', 'Season', 'MatchNumber', 'Team1', 'Team2',
       'Venue', 'TossWinner', 'TossDecision', 'SuperOver', 'WinningTeam',
       'WonBy', 'Margin', 'method', 'Player_of_Match', 'Team1Players',
       'Team2Players', 'Umpire1', 'Umpire2'],
      dtype='object')
```

values

In [17]:

```
movies.values
# we will get 2D numpy array
```

```
       '4 wins', '11 January 2019 (USA)'],
      ['Battalion 609', 'tt9472208', nan, ...,
       'Vicky Ahuja|Shoaib Ibrahim|Shrikant Kamat|Elena Kazan|Vishwas
Kini|Major Kishore|Jashn Kohli|Rammy C. Pandey|Manish Sharma|Sparsh Sha
rma|Farnaz Shetty|Vikas Shrivastav|Chandraprakash Thakur|Brajesh Tiwari
|',
       nan, '11 January 2019 (India)'],
      ['The Accidental Prime Minister (film)', 'tt6986710',
       'https://upload.wikimedia.org/wikipedia/en/thumb/a/a1/The_Accid
ental_Prime_Minister_film.jpg/220px-The_Accidental_Prime_Minister_film.
jpg',
       ...,
       'Anupam Kher|Akshaye Khanna|Aahana Kumra|Atul Sharma|Manoj Anan
d|Arjun Mathur|Suzanne Bernert|Abdul Quadir Amin|Bharat Mistri|Divya Se
th|Anil Rastogi|Ramesh Bhatkar|Parrgash Kaur|Jess Kaur|',
       nan, '11 January 2019 (USA)'],
      ...,
      ['Sabse Bada Sukh', 'tt0069204', nan, ...,
       'Vijay Arora|Asrani|Rajni Bala|Kumud Damle|Utpal Dutt|Meeta Fai
yyaz|Rabi Ghosh|Tarun Ghosh|Sanjeev Kumar|Keshto Mukherjee|Meena Rai|',
```

In [18]:

```
student_dict = {
    'name':['nitish','ankit','rupesh','rishabh','amit','disha'],
    'iq':[100,90,120,80,0,0],
    'marks':[80,70,100,50,0,0],
    'package':[10,7,14,2,0,0]
}

students = pd.DataFrame(student_dict)
students

students.set_index('name', inplace=True)
students
```

Out[18]:

name	iq	marks	package
nitish	100	80	10
ankit	90	70	7
rupesh	120	100	14
rishabh	80	50	2
amit	0	0	0
disha	0	0	0

In [19]:

```
1 students.values
```

Out[19]:

```
array([[100,  80,  10],
       [ 90,  70,   7],
       [120, 100,  14],
       [ 80,  50,   2],
       [  0,   0,   0],
       [  0,   0,   0]], dtype=int64)
```

head and tail

In [20]:

```
1 movies.head()
2 # we will get top five rows by default
```

Out[20]:

	title_x	imdb_id	poster_path	wiki_
0	Uri: The Surgical Strike	tt8291224	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/Uri:_The_Surg
1	Battalion 609	tt9472208	NaN	https://en.wikipedia.org/wiki/Battalion_
2	The Accidental Prime Minister (film)	tt6986710	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/The_Accidenta

In [21]:

```
1 movies.head(3)
```

Out[21]:

	title_x	imdb_id	poster_path	
0	Uri: The Surgical Strike	tt8291224	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki
1	Battalion 609	tt9472208	NaN	https://en.wikipedia.or
2	The Accidental Prime Minister (film)	tt6986710	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/

In [22]:

```
1 ipl.tail()
2 # we will get last five rows by default
```

Out[22]:

	ID	City	Date	Season	MatchNumber	Team1	Team2	Venue	TossWinne
945	335986	Kolkata	2008-04-20	2007/08	4	Kolkata Knight Riders	Deccan Chargers	Eden Gardens	Deccar Charger
946	335985	Mumbai	2008-04-20	2007/08	5	Mumbai Indians	Royal Challengers Bangalore	Wankhede Stadium	Mumba Indian
947	335984	Delhi	2008-04-19	2007/08	3	Delhi Daredevils	Rajasthan Royals	Feroz Shah Kotla	Rajasthar Royal
								Punjab	

In [23]:

```
1 ipl.tail(4)
```

Out[23]:

	ID	City	Date	Season	MatchNumber	Team1	Team2	Venue	TossWinne
946	335985	Mumbai	2008-04-20	2007/08	5	Mumbai Indians	Royal Challengers Bangalore	Wankhede Stadium	Mumba Indians
947	335984	Delhi	2008-04-19	2007/08	3	Delhi Daredevils	Rajasthan Royals	Feroz Shah Kotla	Rajasthar Royals
948	335983	Chandigarh	2008-04-19	2007/08	2	Kings XI Punjab	Chennai Super Kings	Punjab Cricket Association Stadium, Mohali	Chenna Super Kings

sample

- we can use this to fetch items from the data frame when there is a bias in the data

In [24]:

```
1 ipl.sample()
2 # it randomly picks any single row
```

Out[24]:

	ID	City	Date	Season	MatchNumber	Team1	Team2	Venue	TossWinner	T
604	598020	Delhi	2013-04-18	2013	24	Delhi Daredevils	Chennai Super Kings	Feroz Shah Kotla	Chennai Super Kings	

In [27]:

```
1 ipl.sample(3)
```

Out[27]:

	ID	City	Date	Season	MatchNumber	Team1	Team2	Venue	T
376	981013	Bangalore	2016-05-24	2016	Qualifier 1	Gujarat Lions	Royal Challengers Bangalore	M Chinnaswamy Stadium	(
452	829761	Kolkata	2015-05-07	2015	42	Kolkata Knight Riders	Delhi Daredevils	Eden Gardens	
862	392212	Centurion	2009-05-06	2009	32	Deccan Chargers	Mumbai Indians	SuperSport Park	

In [28]:

```
1 movies.sample(5)
```

Out[28]:

	title_x	imdb_id	poster_path	w
65	Bypass Road (film)	tt9176260	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/Bypass_Roa
1534	Kyaa Dil Ne Kahaa	tt0327005	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/Kyaa_Dil_Ne
1238	Chehraa	tt0449870	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/Chehraa_(20

info

In [29]:

```
1 movies.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1629 entries, 0 to 1628
Data columns (total 18 columns):
 #   Column            Non-Null Count  Dtype
---  ------            --------------  -----
 0   title_x           1629 non-null   object
 1   imdb_id           1629 non-null   object
 2   poster_path       1526 non-null   object
 3   wiki_link         1629 non-null   object
 4   title_y           1629 non-null   object
 5   original_title    1629 non-null   object
 6   is_adult          1629 non-null   int64
 7   year_of_release   1629 non-null   int64
 8   runtime           1629 non-null   object
 9   genres            1629 non-null   object
 10  imdb_rating       1629 non-null   float64
 11  imdb_votes        1629 non-null   int64
 12  story             1609 non-null   object
 13  summary           1629 non-null   object
```

In [30]:

```
1 ipl.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 950 entries, 0 to 949
Data columns (total 20 columns):
 #   Column           Non-Null Count  Dtype
---  ------           --------------  -----
 0   ID               950 non-null    int64
 1   City             899 non-null    object
 2   Date             950 non-null    object
 3   Season           950 non-null    object
 4   MatchNumber      950 non-null    object
 5   Team1            950 non-null    object
 6   Team2            950 non-null    object
 7   Venue            950 non-null    object
 8   TossWinner       950 non-null    object
 9   TossDecision     950 non-null    object
 10  SuperOver        946 non-null    object
 11  WinningTeam      946 non-null    object
 12  WonBy            950 non-null    object
 13  Margin           932 non-null    float64
```

describe

- provides mathematical summary on the numerical values present in the data

In [31]:

```
1 ipl.describe()
```

Out[31]:

	ID	Margin
count	9.500000e+02	932.000000
mean	8.304852e+05	17.056867
std	3.375678e+05	21.633109
min	3.359820e+05	1.000000
25%	5.012612e+05	6.000000
50%	8.297380e+05	8.000000
75%	1.175372e+06	19.000000
max	1.312200e+06	146.000000

In [32]:

```
1 movies.describe()
```

Out[32]:

	is_adult	year_of_release	imdb_rating	imdb_votes
count	1629.0	1629.000000	1629.000000	1629.000000
mean	0.0	2010.263966	5.557459	5384.263352
std	0.0	5.381542	1.567609	14552.103231
min	0.0	2001.000000	0.000000	0.000000
25%	0.0	2005.000000	4.400000	233.000000
50%	0.0	2011.000000	5.600000	1000.000000
75%	0.0	2015.000000	6.800000	4287.000000
max	0.0	2019.000000	9.400000	310481.000000

isnull

- it checks the presence of null values
- it gives boolean dataframe

In [33]:

```
1 ipl.isnull()
```

Out[33]:

	ID	City	Date	Season	MatchNumber	Team1	Team2	Venue	TossWinner	TossDecision	Super
0	False	False	False	False	False	False	False	False	False	False	F
1	False	False	False	False	False	False	False	False	False	False	F
2	False	False	False	False	False	False	False	False	False	False	F
3	False	False	False	False	False	False	False	False	False	False	F
4	False	False	False	False	False	False	False	False	False	False	F
...	...	...	...	...	...	...	...	...	...	...	
945	False	False	False	False	False	False	False	False	False	False	F
946	False	False	False	False	False	False	False	False	False	False	F
947	False	False	False	False	False	False	False	False	False	False	F
948	False	False	False	False	False	False	False	False	False	False	F

In [35]:

```
1 # to get the number of null values we will add .sum()
2 ipl.isnull().sum()
```

Out[35]:

```
ID                  0
City               51
Date                0
Season              0
MatchNumber         0
Team1               0
Team2               0
Venue               0
TossWinner          0
TossDecision        0
SuperOver           4
WinningTeam         4
WonBy               0
Margin             18
method            931
Player_of_Match     4
Team1Players        0
Team2Players        0
```

In [36]:

```
1 movies.isnull()
```

Out[36]:

	title_x	imdb_id	poster_path	wiki_link	title_y	original_title	is_adult	year_of_release
0	False	False	False	False	False	False	False	False
1	False	False	True	False	False	False	False	False
2	False	False	False	False	False	False	False	False
3	False	False	False	False	False	False	False	False
4	False	False	True	False	False	False	False	False
...	...	...	...	...	...	...	...	...
1624	False	False	False	False	False	False	False	False
1625	False	False	False	False	False	False	False	False
1626	False	False	True	False	False	False	False	False
1627	False	False	False	False	False	False	False	False
1628	False	False	False	False	False	False	False	False

1629 rows × 18 columns

In [38]:

```
1 movies.isnull().sum()
```

Out[38]:

```
title_x               0
imdb_id               0
poster_path         103
wiki_link             0
title_y               0
original_title        0
is_adult              0
year_of_release       0
runtime               0
genres                0
imdb_rating           0
imdb_votes            0
story                20
summary               0
tagline            1072
actors                5
wins_nominations    922
release_date        107
dtype: int64
```

duplicated

In [39]:

```
1 ipl.duplicated()
```

Out[39]:

```
0      False
1      False
2      False
3      False
4      False
       ...
945    False
946    False
947    False
948    False
949    False
Length: 950, dtype: bool
```

In [40]:

```
1 ipl.duplicated().sum()
```

Out[40]:

```
0
```

In [41]:

```
1 movies.duplicated()
```

Out[41]:

```
0       False
1       False
2       False
3       False
4       False
        ...
1624    False
1625    False
1626    False
1627    False
1628    False
Length: 1629, dtype: bool
```

In [42]:

```
1 movies.duplicated().sum()
2 # to get the total number of duplicated rows
```

Out[42]:

```
0
```

In [43]:

```
student_dict = {
    'iq':[100,90,120,80,0,0],
    'marks':[80,70,100,50,0,0],
    'package':[10,7,14,2,0,0]
}

students = pd.DataFrame(student_dict)
students
```

Out[43]:

	iq	marks	package
0	100	80	10
1	90	70	7
2	120	100	14
3	80	50	2
4	0	0	0
5	0	0	0

In [44]:

```
students.duplicated().sum()
```

Out[44]:

1

rename

- help us to rename the column name of the dataframe

In [45]:

```
students
# we want percentage instead of marks
# and instead of package we want LPA
```

Out[45]:

	iq	marks	package
0	100	80	10
1	90	70	7
2	120	100	14
3	80	50	2
4	0	0	0
5	0	0	0

In [46]:

```
students.rename(columns={"marks":"percent","package":"LPA"})
# we are passing the dictionary using columns parameter inside rename
# this is not permanent change
# for permanent change use inplace=True parameter
```

Out[46]:

	iq	percent	LPA
0	100	80	10
1	90	70	7
2	120	100	14
3	80	50	2
4	0	0	0
5	0	0	0

In [47]:

```
students.rename(index={0:"zero",1:"first",2:"second",
                       3:"third",4:"fourth",5:"fifth"})
```

Out[47]:

	iq	marks	package
zero	100	80	10
first	90	70	7
second	120	100	14
third	80	50	2
fourth	0	0	0
fifth	0	0	0

Math Methods

In [48]:

```
student_dict = {
    'iq':[100,90,120,80,0,0],
    'marks':[80,70,100,50,0,0],
    'package':[10,7,14,2,0,0]
}

students = pd.DataFrame(student_dict)
students
```

Out[48]:

	iq	marks	package
0	100	80	10
1	90	70	7
2	120	100	14
3	80	50	2
4	0	0	0
5	0	0	0

sum

In [49]:

```
'''this function will automatically apply sum on the
columns of the dataframe'''
students.sum()
```

Out[49]:

```
iq         390
marks      300
package     33
dtype: int64
```

In [50]:

```
# we can apply sum on rows also by using axis parameter
students.sum(axis=1)
```

Out[50]:

```
0    190
1    167
2    234
3    132
4      0
5      0
dtype: int64
```

In [51]:

```
'''even if string is present in the data, it will add them
and concatination will happen'''
movies.sum()
```

```
C:\Users\gadha\AppData\Local\Temp\ipykernel_2036\3281507241.py:3: FutureWa
rning: Dropping of nuisance columns in DataFrame reductions (with 'numeric
_only=None') is deprecated; in a future version this will raise TypeError.
Select only valid columns before calling the reduction.
  movies.sum()
```

Out[51]:

```
title_x           Uri: The Surgical StrikeBattalion 609The Accid...
imdb_id           tt8291224tt9472208tt6986710tt8108208tt6028796t...
wiki_link         https://en.wikipedia.org/wiki/Uri:_The_Surgica... (http
s://en.wikipedia.org/wiki/Uri:_The_Surgica...)
title_y           Uri: The Surgical StrikeBattalion 609The Accid...
original_title    Uri: The Surgical StrikeBattalion 609The Accid...
is_adult                                                          0
year_of_release                                             3274720
runtime           13813111212110297109104148120134153143130143 11...
genres            Action|Drama|WarWarBiography|DramaCrime|DramaD...
imdb_rating                                                  9053.1
imdb_votes                                                  8770965
summary           Indian army special forces execute a covert op...
dtype: object
```

In [48]:

```
ipl.sum()
```

```
C:\Users\gadha\AppData\Local\Temp\ipykernel_4404\599940423.py:1: Future
Warning: Dropping of nuisance columns in DataFrame reductions (with 'nu
meric_only=None') is deprecated; in a future version this will raise Ty
peError.  Select only valid columns before calling the reduction.
  ipl.sum()
```

Out[48]:

```
ID                                                    788960985
Date            2022-05-292022-05-272022-05-252022-05-242022-0...
Season          2022202220222022202220222022202220222022202220...
MatchNumber     FinalQualifier 2EliminatorQualifier 1706968676...
Team1           Rajasthan RoyalsRoyal Challengers BangaloreRoy...
Team2           Gujarat TitansRajasthan RoyalsLucknow Super Gi...
Venue           Narendra Modi Stadium, AhmedabadNarendra Modi ...
TossWinner      Rajasthan RoyalsRajasthan RoyalsLucknow Super ...
TossDecision    batfieldfieldfieldbatfieldbatbatbatfieldfieldb...
WonBy           WicketsWicketsRunsWicketsWicketsWicketsWickets...
Margin                                                  15897.0
Team1Players    ['YBK Jaiswal', 'JC Buttler', 'SV Samson', 'D ...
```

In [49]:

```
ipl.sum(axis=1)
# row wise
```

```
C:\Users\gadha\AppData\Local\Temp\ipykernel_4404\3452818570.py:1: FutureWa
rning: Dropping of nuisance columns in DataFrame reductions (with 'numeric
_only=None') is deprecated; in a future version this will raise TypeError.
Select only valid columns before calling the reduction.
  ipl.sum(axis=1)
```

Out[49]:

```
0      1312207.0
1      1312206.0
2      1312212.0
3      1312204.0
4      1304121.0
         ...
945     335991.0
946     335990.0
947     335993.0
948     336016.0
949     336122.0
Length: 950, dtype: float64
```

mean

In [50]:

```
students.mean()
```

Out[50]:

```
iq         65.0
marks      50.0
package     5.5
dtype: float64
```

In [51]:

```
students.mean(axis=1)
# for row wise mean
```

Out[51]:

```
0    63.333333
1    55.666667
2    78.000000
3    44.000000
4     0.000000
5     0.000000
dtype: float64
```

median

In [52]:

```
students.median()
```

Out[52]:

```
iq         85.0
marks      60.0
package     4.5
dtype: float64
```

var

In [55]:

```
students.var()
```

Out[55]:

```
iq         2710.0
marks      1760.0
package      33.5
dtype: float64
```

In [56]:

```
students.var(axis=1)
# row wise variance
```

Out[56]:

```
0    2233.333333
1    1876.333333
2    3172.000000
3    1548.000000
4       0.000000
5       0.000000
dtype: float64
```

std

In [57]:

```
students.std()
```

Out[57]:

```
iq         52.057660
marks      41.952354
package     5.787918
dtype: float64
```

min

In [58]:

```
1 students.min()
```

Out[58]:

```
iq         0
marks      0
package    0
dtype: int64
```

In [59]:

```
1 students.min(axis=1)
```

Out[59]:

```
0    10
1     7
2    14
3     2
4     0
5     0
dtype: int64
```

max

In [60]:

```
1 students.max()
```

Out[60]:

```
iq         120
marks      100
package     14
dtype: int64
```

In [61]:

```
1 students.max(axis=1)
```

Out[61]:

```
0    100
1     90
2    120
3     80
4      0
5      0
dtype: int64
```

Selecting cols from a DataFrame

single column

In [62]:

```
1 movies.head(2)
```

Out[62]:

	title_x	imdb_id	poster_path	
0	Uri: The Surgical Strike	tt8291224	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/U
1	Battalion 609	tt9472208	NaN	https://en.wikipedia.org/

In [63]:

```
1 movies['title_x']
```

Out[63]:

```
0                   Uri: The Surgical Strike
1                             Battalion 609
2       The Accidental Prime Minister (film)
3                           Why Cheat India
4                           Evening Shadows
                        ...
1624                   Tera Mera Saath Rahen
1625                    Yeh Zindagi Ka Safar
1626                         Sabse Bada Sukh
1627                                  Daaka
1628                                Humsafar
Name: title_x, Length: 1629, dtype: object
```

In [64]:

```
1 type(movies['title_x'])
2 # fetched single column will be of series datatype
```

Out[64]:

```
pandas.core.series.Series
```

multiple columns

In [65]:

```
movies[['title_x','year_of_release','actors']]
# we will get dataframe because multiple columns are there
```

Out[65]:

	title_x	year_of_release	actors
0	Uri: The Surgical Strike	2019	Vicky Kaushal|Paresh Rawal|Mohit Raina|Yami Ga...
1	Battalion 609	2019	Vicky Ahuja|Shoaib Ibrahim|Shrikant Kamat|Elen...
2	The Accidental Prime Minister (film)	2019	Anupam Kher|Akshaye Khanna|Aahana Kumra|Atul S...
3	Why Cheat India	2019	Emraan Hashmi|Shreya Dhanwanthary|Snighdadeep ...
4	Evening Shadows	2018	Mona Ambegaonkar|Ananth Narayan Mahadevan|Deva...
...	...	...	...
1624	Tera Mera Saath Rahen	2001	Ajay Devgn|Sonali Bendre|Namrata Shirodkar|Pre...
1625	Yeh Zindagi Ka Safar	2001	Ameesha Patel|Jimmy Sheirgill|Nafisa Ali|Gulsh...
1626	Sabse Bada Sukh	2018	Vijay Arora|Asrani|Rajni Bala|Kumud Damle|Utpa...
1627	Daaka	2019	Gippy Grewal|Zareen Khan|
1628	Humsafar	2011	Fawad Khan|

1629 rows × 3 columns

In [66]:

```
# we can give the order for getting columns
movies[['year_of_release','actors','title_x']]
```

Out[66]:

	year_of_release	actors	title_x
0	2019	Vicky Kaushal|Paresh Rawal|Mohit Raina|Yami Ga...	Uri: The Surgical Strike
1	2019	Vicky Ahuja|Shoaib Ibrahim|Shrikant Kamat|Elen...	Battalion 609
2	2019	Anupam Kher|Akshaye Khanna|Aahana Kumra|Atul S...	The Accidental Prime Minister (film)
3	2019	Emraan Hashmi|Shreya Dhanwanthary|Snighdadeep ...	Why Cheat India
4	2018	Mona Ambegaonkar|Ananth Narayan Mahadevan|Deva...	Evening Shadows
...	...	...	...
1624	2001	Ajay Devgn|Sonali Bendre|Namrata Shirodkar|Pre...	Tera Mera Saath Rahen
1625	2001	Ameesha Patel|Jimmy Sheirgill|Nafisa Ali|Gulsh...	Yeh Zindagi Ka Safar
1626	2018	Vijay Arora|Asrani|Rajni Bala|Kumud Damle|Utpa...	Sabse Bada Sukh
1627	2019	Gippy Grewal|Zareen Khan|	Daaka
1628	2011	Fawad Khan|	Humsafar

1629 rows × 3 columns

In [67]:

```
ipl.head(2)
```

Out[67]:

	ID	City	Date	Season	MatchNumber	Team1	Team2	Venue	T
0	1312200	Ahmedabad	2022-05-29	2022	Final	Rajasthan Royals	Gujarat Titans	Narendra Modi Stadium, Ahmedabad	
1	1312199	Ahmedabad	2022-05-27	2022	Qualifier 2	Royal Challengers Bangalore	Rajasthan Royals	Narendra Modi Stadium, Ahmedabad	

In [70]:

```
1 ipl[['Team1','Team2','WinningTeam']]
```

Out[70]:

	Team1	Team2	WinningTeam
0	Rajasthan Royals	Gujarat Titans	Gujarat Titans
1	Royal Challengers Bangalore	Rajasthan Royals	Rajasthan Royals
2	Royal Challengers Bangalore	Lucknow Super Giants	Royal Challengers Bangalore
3	Rajasthan Royals	Gujarat Titans	Gujarat Titans
4	Sunrisers Hyderabad	Punjab Kings	Punjab Kings
...	...	...	...
945	Kolkata Knight Riders	Deccan Chargers	Kolkata Knight Riders
946	Mumbai Indians	Royal Challengers Bangalore	Royal Challengers Bangalore
947	Delhi Daredevils	Rajasthan Royals	Delhi Daredevils
948	Kings XI Punjab	Chennai Super Kings	Chennai Super Kings
949	Royal Challengers Bangalore	Kolkata Knight Riders	Kolkata Knight Riders

950 rows × 3 columns

Selecting rows from a DataFrame

- **iloc** - searches using index positions
- **loc** - searches using index labels

1. iloc

single row

In [71]:

```
1 movies.head(3)
```

Out[71]:

	title_x	imdb_id	poster_path	
0	Uri: The Surgical Strike	tt8291224	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki
1	Battalion 609	tt9472208	NaN	https://en.wikipedia.or
2	The Accidental Prime Minister (film)	tt6986710	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/

In [72]:

```
1 # suppose we want first row
2 movies.iloc[0]
3 # it will be a series because it's a single row
```

Out[72]:

```
title_x                                    Uri: The Surgical Strike
imdb_id                                                  tt8291224
poster_path         https://upload.wikimedia.org/wikipedia/en/thum... (htt
ps://upload.wikimedia.org/wikipedia/en/thum...)
wiki_link           https://en.wikipedia.org/wiki/Uri:_The_Surgica... (htt
ps://en.wikipedia.org/wiki/Uri:_The_Surgica...)
title_y                                    Uri: The Surgical Strike
original_title                             Uri: The Surgical Strike
is_adult                                                          0
year_of_release                                                2019
runtime                                                         138
genres                                            Action|Drama|War
imdb_rating                                                     8.4
imdb_votes                                                    35112
story               Divided over five chapters  the film chronicle...
summary             Indian army special forces execute a covert op...
tagline                                                         NaN
actors              Vicky Kaushal|Paresh Rawal|Mohit Raina|Yami Ga...
wins_nominations                                              4 wins
release_date                                  11 January 2019 (USA)
Name: 0, dtype: object
```

In [73]:

```
type(movies.iloc[0])
```

Out[73]:

```
pandas.core.series.Series
```

multiple row

In [74]:

```
movies.iloc[0:5]
# this will be dataframe data type
```

Out[74]:

	title_x	imdb_id	poster_path	wiki_
0	Uri: The Surgical Strike	tt8291224	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/Uri:_The_Surg
1	Battalion 609	tt9472208	NaN	https://en.wikipedia.org/wiki/Battalion_
2	The Accidental Prime Minister (film)	tt6986710	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/The_Accidenta

In [75]:

```
# we want alternate movies between 5 to 15
movies.iloc[5:15:2]
```

Out[75]:

	title_x	imdb_id	poster_path	wiki_
5	Soni (film)	tt6078866	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/Soni_(f
7	Bombairiya	tt4971258	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/Bombai
9	Thackeray (film)	tt7777196	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/Thackeray_(f

fancy indexing

In [76]:

```
movies.iloc[[0,4,7,8]]
# we are passing list of items we want
```

Out[76]:

	title_x	imdb_id	poster_path	wi
0	Uri: The Surgical Strike	tt8291224	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/Uri:_The_Su
4	Evening Shadows	tt6028796	NaN	https://en.wikipedia.org/wiki/Evening_Sh
7	Bombairiya	tt4971258	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/Bom

2. loc

- when we provide range for fetching multiple items then the last number of given range will be included where as in iloc the last number is not included

In [77]:

```
student_dict = {
    'name':['nitish','ankit','rupesh','rishabh','amit','himanshu'],
    'iq':[100,90,120,80,0,0],
    'marks':[80,70,100,50,0,0],
    'package':[10,7,14,2,0,0]
}

students = pd.DataFrame(student_dict)
students.set_index('name',inplace=True)
# we are setting name columns as our index
students
```

Out[77]:

name	iq	marks	package
nitish	100	80	10
ankit	90	70	7
rupesh	120	100	14
rishabh	80	50	2
amit	0	0	0
himanshu	0	0	0

single row

In [78]:

```
students.loc['rupesh']
```

Out[78]:

```
iq         120
marks      100
package     14
Name: rupesh, dtype: int64
```

multiple rows

In [79]:

```
students.loc['nitish':'rishabh']
```

Out[79]:

name	iq	marks	package
nitish	100	80	10
ankit	90	70	7
rupesh	120	100	14
rishabh	80	50	2

In [80]:

```
students.loc['nitish':'rishabh':2]
# it will print alternare rows because step value is 2
```

Out[80]:

name	iq	marks	package
nitish	100	80	10
rupesh	120	100	14

fancy indexing

In [81]:

```
students.loc[['nitish','rupesh','himanshu']]
```

Out[81]:

name	iq	marks	package
nitish	100	80	10
rupesh	120	100	14
himanshu	0	0	0

- **Note :** we can also use iloc on the students data though we have name column as index, because there is default index by pandas so here 0 and nitish will point out on same row positon

In [82]:

```
students.iloc[[1,3,5]]
```

Out[82]:

name	iq	marks	package
ankit	90	70	7
rishabh	80	50	2
himanshu	0	0	0

Selecting both rows and columns

In [83]:

```
movies.iloc[0:3,0:3]
```

Out[83]:

	title_x	imdb_id	poster_path
0	Uri: The Surgical Strike	tt8291224	https://upload.wikimedia.org/wikipedia/en/thum...
1	Battalion 609	tt9472208	NaN
2	The Accidental Prime Minister (film)	tt6986710	https://upload.wikimedia.org/wikipedia/en/thum...

In [84]:

```
movies.loc[0:2,'title_x':'poster_path']
```

Out[84]:

	title_x	imdb_id	poster_path
0	Uri: The Surgical Strike	tt8291224	https://upload.wikimedia.org/wikipedia/en/thum...
1	Battalion 609	tt9472208	NaN
2	The Accidental Prime Minister (film)	tt6986710	https://upload.wikimedia.org/wikipedia/en/thum...

Filtering a DataFrame

In [85]:

```
1 ipl.head()
```

Out[85]:

	ID	City	Date	Season	MatchNumber	Team1	Team2	Venue	TossWinner	To
0	1312200	Ahmedabad	2022-05-29	2022	Final	Rajasthan Royals	Gujarat Titans	Narendra Modi Stadium, Ahmedabad	Rajasthan Royals	
1	1312199	Ahmedabad	2022-05-27	2022	Qualifier 2	Royal Challengers Bangalore	Rajasthan Royals	Narendra Modi Stadium, Ahmedabad	Rajasthan Royals	
2	1312198	Kolkata	2022-05-25	2022	Eliminator	Royal Challengers Bangalore	Lucknow Super Giants	Eden Gardens, Kolkata	Lucknow Super Giants	
			2022-			Rajasthan	Gujarat	Eden	Gujarat	

- Find all the final winners

In [86]:

```
1 '''we can see in the data that the Final match of each season
2 is labeled, so we will fetch that first'''
3
4 ipl["MatchNumber"] == "Final"
5 # with this code we will get the boolean series
```

Out[86]:

```
0       True
1      False
2      False
3      False
4      False
       ...
945    False
946    False
947    False
948    False
949    False
Name: MatchNumber, Length: 950, dtype: bool
```

In [87]:

```
ipl[ipl["MatchNumber"] == "Final"]
# we will get the data of final matches only
```

Out[87]:

	ID	City	Date	Season	MatchNumber	Team1	Team2	Venue	TossWi
0	1312200	Ahmedabad	2022-05-29	2022	Final	Rajasthan Royals	Gujarat Titans	Narendra Modi Stadium, Ahmedabad	Rajas Rc
74	1254117	Dubai	2021-10-15	2021	Final	Chennai Super Kings	Kolkata Knight Riders	Dubai International Cricket Stadium	Ko Ki Ri
134	1237181	NaN	2020-11-10	2020/21	Final	Delhi Capitals	Mumbai Indians	Dubai International Cricket Stadium	Cap
194	1181768	Hyderabad	2019-	2019	Final	Mumbai	Chennai Super	Rajiv Gandhi International	Mu

In [88]:

```
# storing this result in new dataframe
new_df = ipl[ipl["MatchNumber"] == "Final"]
```

In [89]:

```
new_df[["Season","WinningTeam"]]
# we are doing fancy indexing by passing a list
```

Out[89]:

	Season	WinningTeam
0	2022	Gujarat Titans
74	2021	Chennai Super Kings
134	2020/21	Mumbai Indians
194	2019	Mumbai Indians
254	2018	Chennai Super Kings
314	2017	Mumbai Indians
373	2016	Sunrisers Hyderabad
433	2015	Mumbai Indians
492	2014	Kolkata Knight Riders
552	2013	Mumbai Indians
628	2012	Kolkata Knight Riders

In [90]:

```
# we can do that in one line also
ipl[ipl["MatchNumber"] == "Final"][["Season","WinningTeam"]]
```

Out[90]:

	Season	WinningTeam
0	2022	Gujarat Titans
74	2021	Chennai Super Kings
134	2020/21	Mumbai Indians
194	2019	Mumbai Indians
254	2018	Chennai Super Kings
314	2017	Mumbai Indians
373	2016	Sunrisers Hyderabad
433	2015	Mumbai Indians
492	2014	Kolkata Knight Riders
552	2013	Mumbai Indians
628	2012	Kolkata Knight Riders

- how many super over finishes have occured

In [91]:

```
ipl["SuperOver"] == "Y"
```

Out[91]:

```
0      False
1      False
2      False
3      False
4      False
       ...
945    False
946    False
947    False
948    False
949    False
Name: SuperOver, Length: 950, dtype: bool
```

In [92]:

```
1 ipl[ipl["SuperOver"] == "Y"]
```

Out[92]:

	ID	City	Date	Season	MatchNumber	Team1	Team2	Venue	TossWinn
114	1254077	Chennai	2021-04-25	2021	20	Delhi Capitals	Sunrisers Hyderabad	MA Chidambaram Stadium, Chepauk, Chennai	De Capita
158	1216512	Abu Dhabi	2020-10-18	2020/21	35	Kolkata Knight Riders	Sunrisers Hyderabad	Sheikh Zayed Stadium	Sunrise Hyderab
159	1216517	NaN	2020-10-18	2020/21	36	Mumbai Indians	Kings XI Punjab	Dubai International Cricket Stadium	Mumb India
184	1216547	NaN	2020-	2020/21	10	Royal Challengers	Mumbai	Dubai International	Mumb

In [93]:

```
1 ipl[ipl["SuperOver"] == "Y"].shape[0]
2 # so far 14 matches had a superover
```

Out[93]:

14

- how many matches has csk won in kolkata

In [94]:

```
1 ipl.head()
```

Out[94]:

	ID	City	Date	Season	MatchNumber	Team1	Team2	Venue	TossWinner	To
0	1312200	Ahmedabad	2022-05-29	2022	Final	Rajasthan Royals	Gujarat Titans	Narendra Modi Stadium, Ahmedabad	Rajasthan Royals	
1	1312199	Ahmedabad	2022-05-27	2022	Qualifier 2	Royal Challengers Bangalore	Rajasthan Royals	Narendra Modi Stadium, Ahmedabad	Rajasthan Royals	
2	1312198	Kolkata	2022-05-25	2022	Eliminator	Royal Challengers Bangalore	Lucknow Super Giants	Eden Gardens, Kolkata	Lucknow Super Giants	
			2022-			Rajasthan	Gujarat	Eden	Gujarat	

In [95]:

```
1 ipl[ipl["City"] == "Kolkata"]
2 # this are matches played in kolkata vanue
```

Out[95]:

	ID	City	Date	Season	MatchNumber	Team1	Team2	Venue	TossWinner	Toss
2	1312198	Kolkata	2022-05-25	2022	Eliminator	Royal Challengers Bangalore	Lucknow Super Giants	Eden Gardens, Kolkata	Lucknow Super Giants	
3	1312197	Kolkata	2022-05-24	2022	Qualifier 1	Rajasthan Royals	Gujarat Titans	Eden Gardens, Kolkata	Gujarat Titans	
207	1178422	Kolkata	2019-04-28	2019	47	Kolkata Knight Riders	Mumbai Indians	Eden Gardens	Mumbai Indians	
211	1178418	Kolkata	2019-	2019	43	Kolkata Knight	Rajasthan	Eden	Rajasthan	

In [100]:

```
(ipl['City'] =='Kolkata') & (ipl['WinningTeam'] ==  'Chennai Super Kings')
```

Out[100]:

```
0      False
1      False
2      False
3      False
4      False
       ...
945    False
946    False
947    False
948    False
949    False
Length: 950, dtype: bool
```

In [101]:

```
ipl[(ipl['City'] =='Kolkata') & (ipl['WinningTeam'] == 'Chennai Super Kings')]
```

Out[101]:

	ID	City	Date	Season	MatchNumber	Team1	Team2	Venue	TossWinner	TossDecisior
224	1178404	Kolkata	2019-04-14	2019	29	Kolkata Knight Riders	Chennai Super Kings	Eden Gardens	Chennai Super Kings	fiel
602	598022	Kolkata	2013-04-20	2013	26	Kolkata Knight Riders	Chennai Super Kings	Eden Gardens	Kolkata Knight Riders	ba
641	548368	Kolkata	2012-05-14	2012	63	Kolkata Knight Riders	Chennai Super Kings	Eden Gardens	Chennai Super Kings	fiel
						Kolkata	Chennai			

In [102]:

```
ipl[(ipl['City'] =='Kolkata') &
    (ipl['WinningTeam'] == 'Chennai Super Kings')].shape[0]
```

Out[102]:

```
5
```

- toss winner is match winner in percentage

In [103]:

```
1 ipl.head(1)
```

Out[103]:

	ID	City	Date	Season	MatchNumber	Team1	Team2	Venue	TossV
0	1312200	Ahmedabad	2022-05-29	2022	Final	Rajasthan Royals	Gujarat Titans	Narendra Modi Stadium, Ahmedabad	Raj I

In [104]:

```
1 ipl['TossWinner'] == ipl['WinningTeam']
2 # we are doing compariosion for this two column
```

Out[104]:

```
0      False
1       True
2      False
3       True
4      False
       ...
945    False
946    False
947    False
948     True
949    False
Length: 950, dtype: bool
```

In [105]:

```
1 ipl[ipl['TossWinner'] == ipl['WinningTeam']]
```

Out[105]:

	ID	City	Date	Season	MatchNumber	Team1	Team2	Venue	TossWinner
1	1312199	Ahmedabad	2022-05-27	2022	Qualifier 2	Royal Challengers Bangalore	Rajasthan Royals	Narendra Modi Stadium, Ahmedabad	Rajasthan Royals
3	1312197	Kolkata	2022-05-24	2022	Qualifier 1	Rajasthan Royals	Gujarat Titans	Eden Gardens, Kolkata	Gujarat Titans
5	1304115	Mumbai	2022-05-21	2022	69	Delhi Capitals	Mumbai Indians	Wankhede Stadium, Mumbai	Mumbai Indians
8	1304112	Navi	2022-	2022	66	Lucknow Super	Kolkata Knight	Dr DY Patil Sports	Lucknow Supe

In [106]:

```
ipl[ipl['TossWinner'] == ipl['WinningTeam']].shape[0]
```

Out[106]:

```
489
```

In [107]:

```
ipl.shape[0]
```

Out[107]:

```
950
```

In [108]:

```
a = ipl[ipl['TossWinner'] == ipl['WinningTeam']].shape[0]
b = ipl.shape[0]

percentage = (a/b)*100

percentage
```

Out[108]:

```
51.473684210526315
```

- movies with rating higher than 8 and votes>10000

In [109]:

```
movies
```

Out[109]:

	title_x	imdb_id	poster_path	
0	Uri: The Surgical Strike	tt8291224	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/Uri:_The
1	Battalion 609	tt9472208	NaN	https://en.wikipedia.org/wiki/Ba
2	The Accidental Prime Minister (film)	tt6986710	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/The_Acc

In [110]:

```
movies[(movies['imdb_rating'] > 8) & (movies['imdb_votes'] > 10000 )]
```

Out[110]:

	title_x	imdb_id	poster_path	
0	Uri: The Surgical Strike	tt8291224	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/Ur
11	Gully Boy	tt2395469	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.o
37	Article 15 (film)	tt10324144	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wik
40	Super 30 (film)	tt7485048	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wik

In [111]:

```
(movies['imdb_rating'] > 8) & (movies['imdb_votes'] > 10000 )
```

Out[111]:

```
0        True
1       False
2       False
3       False
4       False
        ...
1624    False
1625    False
1626    False
1627    False
1628    False
Length: 1629, dtype: bool
```

In [113]:

```
movies[(movies['imdb_rating'] > 8) & (
    movies['imdb_votes'] > 10000 )].shape[0]
```

Out[113]:

```
43
```

- Action movies with rating higher than 7.5

In [114]:

```
movies.head()
'''here in data if we look in to genres,
there is combination of genres in that column'''
```

Out[114]:

```
'here in data if we look in to genres,\nthere is combination of genres in
that column'
```

In [115]:

```
movies['genres']
```

Out[115]:

```
0       Action|Drama|War
1                    War
2         Biography|Drama
3             Crime|Drama
4                   Drama
               ...
1624                Drama
1625                Drama
1626         Comedy|Drama
1627               Action
1628        Drama|Romance
Name: genres, Length: 1629, dtype: object
```

In [116]:

```
'''in the above column that data type is string,
now we want only action movies out of that,
if we directly apply split(|) on that Series then
it will throw an error,
so we need to convert it in string object method'''

movies['genres'].str.split('|')
```

Out[116]:

```
0       [Action, Drama, War]
1                    [War]
2          [Biography, Drama]
3              [Crime, Drama]
4                    [Drama]
                ...
1624                 [Drama]
1625                 [Drama]
1626          [Comedy, Drama]
1627                [Action]
1628         [Drama, Romance]
Name: genres, Length: 1629, dtype: object
```

In [117]:

```
movies['genres'].str.split('|').apply(lambda x:'Action' in x)
# here we are checking if action genre is present or not
```

Out[117]:

```
0        True
1       False
2       False
3       False
4       False
        ...
1624    False
1625    False
1626    False
1627     True
1628    False
Name: genres, Length: 1629, dtype: bool
```

In [119]:

```
mask1 = movies['genres'].str.split('|').apply(lambda x:'Action' in x)

# now we want movies with rating > 7.5

mask2 = movies['imdb_rating'] > 7.5
```

In [120]:

```
movies[mask1 & mask2].head()
```

Out[120]:

	title_x	imdb_id	poster_path	
0	Uri: The Surgical Strike	tt8291224	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/Uri:_The_
41	Family of Thakurganj	tt8897986	https://upload.wikimedia.org/wikipedia/en/9/99...	https://en.wikipedia.org/wiki/Family_of_
84	Mukkabaaz	tt7180544	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/M

In [121]:

```
# using containg function

mask1 = movies['genres'].str.contains('Action')

'''now we want movies with rating > 7.5'''

mask2 = movies['imdb_rating'] > 7.5

movies[mask1 & mask2].head()
```

Out[121]:

	title_x	imdb_id	poster_path	
0	Uri: The Surgical Strike	tt8291224	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/Uri:_The_
41	Family of Thakurganj	tt8897986	https://upload.wikimedia.org/wikipedia/en/9/99...	https://en.wikipedia.org/wiki/Family_of_
84	Mukkabaaz	tt7180544	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/M

- write a function that can return the track record of 2 teams against each other

In [ ]:

```
1
```

Adding new cols

In [122]:

```
1 movies.head()
```

Out[122]:

	title_x	imdb_id	poster_path	wiki_
0	Uri: The Surgical Strike	tt8291224	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/Uri:_The_Surg
1	Battalion 609	tt9472208	NaN	https://en.wikipedia.org/wiki/Battalion_
2	The Accidental Prime Minister (film)	tt6986710	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/The_Accidenta

In [123]:

```
1 movies['Country'] = "India"
```

In [124]:

```
1 movies.head()
2 # new country column will be added in the dataframe
```

Out[124]:

	title_x	imdb_id	poster_path	wiki_
0	Uri: The Surgical Strike	tt8291224	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/Uri:_The_Surg
1	Battalion 609	tt9472208	NaN	https://en.wikipedia.org/wiki/Battalion_
2	The Accidental Prime Minister (film)	tt6986710	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/The_Accidenta

- we want to make new column lead actor and here value will come from Actors column. The first name in the Actors column will be the lead actor of that particular movies, so we want that.

In [125]:

```
1 movies['actors'].head()
```

Out[125]:

```
0    Vicky Kaushal|Paresh Rawal|Mohit Raina|Yami Ga...
1    Vicky Ahuja|Shoaib Ibrahim|Shrikant Kamat|Elen...
2    Anupam Kher|Akshaye Khanna|Aahana Kumra|Atul S...
3    Emraan Hashmi|Shreya Dhanwanthary|Snighdadeep ...
4    Mona Ambegaonkar|Ananth Narayan Mahadevan|Deva...
Name: actors, dtype: object
```

In [126]:

```
1 movies['actors'].str.split('|')
```

Out[126]:

```
0       [Vicky Kaushal, Paresh Rawal, Mohit Raina, Yam...
1       [Vicky Ahuja, Shoaib Ibrahim, Shrikant Kamat, ...
2       [Anupam Kher, Akshaye Khanna, Aahana Kumra, At...
3       [Emraan Hashmi, Shreya Dhanwanthary, Snighdade...
4       [Mona Ambegaonkar, Ananth Narayan Mahadevan, D...
                              ...
1624    [Ajay Devgn, Sonali Bendre, Namrata Shirodkar,...
1625    [Ameesha Patel, Jimmy Sheirgill, Nafisa Ali, G...
1626    [Vijay Arora, Asrani, Rajni Bala, Kumud Damle,...
1627                        [Gippy Grewal, Zareen Khan, ]
1628                                      [Fawad Khan, ]
Name: actors, Length: 1629, dtype: object
```

In [127]:

```
movies['actors'].str.split('|').apply(lambda x:x[0])
'''here this code will show an error because
there are some missing values in actors column

Pandas treat missing values as float values
so the logic we wrote in the code will throw an error

so here first we have to remove the missing value'''
```

```
---------------------------------------------------------------------
----
TypeError                                 Traceback (most recent call l
ast)
~\AppData\Local\Temp\ipykernel_4404\3178307672.py in <module>
----> 1 movies['actors'].str.split('|').apply(lambda x:x[0])
      2 '''here this code will show an error because
      3 there are some missing values in actors column
      4
      5 Pandas treat missing values as float values

~\anaconda3\lib\site-packages\pandas\core\series.py in apply(self, fun
c, convert_dtype, args, **kwargs)
   4431         dtype: float64
   4432         """
-> 4433         return SeriesApply(self, func, convert_dtype, args, kwa
rgs).apply()
   4434
   4435     def _reduce(
```

In [128]:

```
movies.dropna(inplace=True)
```

In [129]:

```
movies.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 298 entries, 11 to 1623
Data columns (total 19 columns):
 #   Column            Non-Null Count  Dtype
---  ------            --------------  -----
 0   title_x           298 non-null    object
 1   imdb_id           298 non-null    object
 2   poster_path       298 non-null    object
 3   wiki_link         298 non-null    object
 4   title_y           298 non-null    object
 5   original_title    298 non-null    object
 6   is_adult          298 non-null    int64
 7   year_of_release   298 non-null    int64
 8   runtime           298 non-null    object
 9   genres            298 non-null    object
 10  imdb_rating       298 non-null    float64
 11  imdb_votes        298 non-null    int64
 12  story             298 non-null    object
 13  summary           298 non-null    object
```

In [130]:

```
movies['actors'].str.split('|').apply(lambda x:x[0])
```

Out[130]:

```
11             Ranveer Singh
34              Gavie Chahal
37         Ayushmann Khurrana
87          Sidharth Malhotra
96                  Ajay Devgn
                  ...
1600             Divya Dutta
1601               Anant Nag
1607             Anil Kapoor
1621    Priyanshu Chatterjee
1623          Karisma Kapoor
Name: actors, Length: 298, dtype: object
```

In [131]:

```
movies['lead actor'] = movies['actors'].str.split('|').apply(lambda x:x[0])
```

In [132]:

```
movies.head()
# lead actors column is added in the last in the data frame
```

Out[132]:

	title_x	imdb_id	poster_path	wiki_lin
11	Gully Boy	tt2395469	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/Gully_Bo
34	Yeh Hai India	tt5525846	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/Yeh_Hai_Ind
37	Article 15 (film)	tt10324144	https://upload.wikimedia.org/wikipedia/en/thum...	https://en.wikipedia.org/wiki/Article_15_(filn

Important DataFrame Functions

astype

- it changes the data type of the given column

In [133]:

```
ipl.info()
# here memory occupied by ipl dataset is 148.6 kb
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 950 entries, 0 to 949
Data columns (total 20 columns):
 #   Column           Non-Null Count  Dtype
---  ------           --------------  -----
 0   ID               950 non-null    int64
 1   City             899 non-null    object
 2   Date             950 non-null    object
 3   Season           950 non-null    object
 4   MatchNumber      950 non-null    object
 5   Team1            950 non-null    object
 6   Team2            950 non-null    object
 7   Venue            950 non-null    object
 8   TossWinner       950 non-null    object
 9   TossDecision     950 non-null    object
 10  SuperOver        946 non-null    object
 11  WinningTeam      946 non-null    object
 12  WonBy            950 non-null    object
 13  Margin           932 non-null    float64
```

In [134]:

```
ipl['ID'].astype('int32')
# we changed the data type of ID column to int32
```

Out[134]:

```
0      1312200
1      1312199
2      1312198
3      1312197
4      1304116
        ...
945     335986
946     335985
947     335984
948     335983
949     335982
Name: ID, Length: 950, dtype: int32
```

In [135]:

```
ipl['ID'] = ipl['ID'].astype('int32')
```

In [136]:

```
ipl.info()
# now memory occcupied by ipl dataset is 144.9 kb
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 950 entries, 0 to 949
Data columns (total 20 columns):
 #   Column           Non-Null Count  Dtype
---  ------           --------------  -----
 0   ID               950 non-null    int32
 1   City             899 non-null    object
 2   Date             950 non-null    object
 3   Season           950 non-null    object
 4   MatchNumber      950 non-null    object
 5   Team1            950 non-null    object
 6   Team2            950 non-null    object
 7   Venue            950 non-null    object
 8   TossWinner       950 non-null    object
 9   TossDecision     950 non-null    object
 10  SuperOver        946 non-null    object
 11  WinningTeam      946 non-null    object
 12  WonBy            950 non-null    object
 13  Margin           932 non-null    float64
```

In [137]:

```
# we will convert season datatype to category data type
# this will further reduce the occupied memory size

ipl['Season'] = ipl['Season'].astype('category')
```

In [139]:

```
ipl.info()
# here memory occupied is 139.0 KB
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 950 entries, 0 to 949
Data columns (total 20 columns):
 #   Column           Non-Null Count  Dtype
---  ------           --------------  -----
 0   ID               950 non-null    int32
 1   City             899 non-null    object
 2   Date             950 non-null    object
 3   Season           950 non-null    category
 4   MatchNumber      950 non-null    object
 5   Team1            950 non-null    object
 6   Team2            950 non-null    object
 7   Venue            950 non-null    object
 8   TossWinner       950 non-null    object
 9   TossDecision     950 non-null    object
 10  SuperOver        946 non-null    object
 11  WinningTeam      946 non-null    object
 12  WonBy            950 non-null    object
 13  Margin           932 non-null    float64
```