- Saving and loading notebooks in GitHub
- Interactive forms
- Interactive widgets

Working with data

- Loading data: Drive, Sheets and Google Cloud Storage
- Charts: visualising data
- Getting started with BigQuery

Machine learning crash course

These are a few of the notebooks from Google's online machine learning course. See the full course website for more.

- Intro to Pandas DataFrame
- Linear regression with tf.keras using synthetic data

Using accelerated hardware

- TensorFlow with GPUs
- TensorFlow with TPUs

Featured examples

- NeMo voice swap: Use Nvidia NeMo conversational AI toolkit to swap a voice in an audio fragment with a computer-generated one.
- Retraining an Image Classifier: Build a Keras model on top of a pre-trained image classifier to distinguish flowers.
- Text Classification: Classify IMDB film reviews as either *positive* or *negative*.
- Style Transfer: Use deep learning to transfer style between images.
- Multilingual Universal Sentence Encoder Q&A: Use a machine-learning model to answer questions from the SQuAD dataset.
- Video Interpolation: Predict what happened in a video between the first and the last frame.

```
import numpy as np
import pandas as pd


import warnings
warnings.filterwarnings("ignore")


#series

s=pd.Series()
print(s)
```

```
Series([], dtype: object)
```

```
s = pd.Series(data=[1,2,3], index=['a','b','c'])

print(s)
```

```
a    1
b    2
c    3
dtype: int64
```

```
d={'a':1,'b':2, 'c':3}
U=pd.Series(d)  #(data=d)
print(U)
```

```
a    1
b    2
c    3
dtype: int64
```

```
d={"a":1,"b":2,"c":3}
s=pd.Series(data=d, index=["c","a","d","b"])
print(s)
```

```
c    3.0
a    1.0
d    NaN
b    2.0
dtype: float64
```

```
i=np.array(["a","b","c"])
d=np.array([1,2,3])
s=pd.Series(data=d, index=i)
print(s)
```

```
a    1
b    2
c    3
dtype: int64
```

```
s=pd.Series(data=5, index=["a","b","c"])
s
```

	0
a	5
b	5
c	5

dtype: int64

```
df=pd.DataFrame()
df
```

```
data=[1,2,3,4,5]
df=pd.DataFrame(data)
df
```

	0
0	1
1	2
2	3
3	4
4	5

```
data=[["i","ii","iii"],["alpha","beta","gama"],['a','b','c']]
df=pd.DataFrame(data, columns=["c1","c2","c3"])
df
```

	c1	c2	c3
0	i	ii	iii
1	alpha	beta	gama
2	a	b	c

```
name=["Pratik", "Purvesh", "Faizan", "Sandesh", "Madhu", "Vinayak", ]
py=[89,78,75,64,45,25]
ml=[89,57,65,78,25,350]
dic={"Name":name, "Python":py, "Machine Learning":ml}
df=pd.DataFrame(dic)
df
```

	Name	Python	Machine Learning
0	Pratik	89	89
1	Purvesh	78	57
2	Faizan	75	65
3	Sandesh	64	78
4	Madhu	45	25
5	Vinayak	25	350

```
df[df.Name=="Pratik"]
```

	Name	Python	Machine Learning
0	Pratik	89	89

```
name = ['Pratik', 'Purvesh', 'Faizan', 'Sandesh', 'Madhu', 'Vinayak']
py = [89,78,75,64,45,25]
ml = [89,57,65,78,25,35]

dic = {"Name":name, "Python":py, "Machine Learning":ml}

df=pd.DataFrame(dic, index=["Rank1", "Rank2", "Rank3","Rank4", "Rank5", "Rank6" ])
df
```

	Name	Python	Machine Learning
Rank1	Pratik	89	89
Rank2	Purvesh	78	57
Rank3	Faizan	75	65
Rank4	Sandesh	64	78
Rank5	Madhu	45	25
Rank6	Vinayak	25	35

Double-click (or enter) to edit

```
df=pd.DataFrame(np.arange(1,5).reshape(2,2), columns=["A","B"])
df
```

	A	B
0	1	2
1	3	4

```
name = pd.Series(['Pratik', 'Purvesh', 'Faizan', 'Sandesh', 'Madhu', 'Vinayak'])
py = pd.Series([89,78,75,64,45,25])
ml = pd.Series([89,57,65,78,25,35])

dic = {"Name":name, "Python":py, "Machine Learning":ml}
df=pd.DataFrame(dic)
df
```

	Name	Python	Machine Learning
0	Pratik	89	89
1	Purvesh	78	57
2	Faizan	75	65
3	Sandesh	64	78
4	Madhu	45	25
5	Vinayak	25	35

```
d= {"One": pd.Series([1,2,3], index=["a","b","c"]),
    "two" : pd.Series([1,2,3,4], index=["a","b","c","d"])}

df=pd.DataFrame(d)
df
```

	One	two
a	1.0	1
b	2.0	2
c	3.0	3
d	NaN	4

```
df=pd.DataFrame(np.random.randn(10,4),columns=["A","B","C","D"])
df
```

	A	B	C	D
0	0.406657	-1.006442	-0.451529	-0.025238
1	-0.347010	0.173467	0.499896	0.422218
2	-0.467744	0.232660	-0.394682	0.295707
3	1.447198	-0.774896	-0.575552	0.335801
4	0.936176	-0.876172	-0.470150	1.299002
5	-2.389562	-0.365573	-1.431594	1.370936
6	-0.831204	-0.101782	0.731069	-0.204984
7	2.282465	1.420874	-0.905127	-2.014094
8	-0.032677	-0.494733	-1.127373	1.049182
9	0.930396	0.711422	-0.426508	-1.223096

```
#1. TSV
df=pd.read_table("chiporders.tsv")  #sep="\t"
df.head()
```

	order_id	quantity	item_name	choice_description	item_price
0	1	1	Chips and Fresh Tomato Salsa	NaN	$2.39
1	1	1	Izze	[Clementine]	$3.39
2	1	1	Nantucket Nectar	[Apple]	$3.39
3	1	1	Chips and Tomatillo-Green Chili Salsa	NaN	$2.39
4	2	2	Chicken Bowl	[Tomatillo-Red Chili Salsa (Hot), [Black Beans...	$16.98

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 4622 entries, 0 to 4621
Data columns (total 5 columns):
 #   Column              Non-Null Count  Dtype 
---  ------              --------------  ----- 
 0   order_id            4622 non-null   int64 
 1   quantity            4622 non-null   int64 
 2   item_name           4622 non-null   object
 3   choice_description  3376 non-null   object
 4   item_price          4622 non-null   object
dtypes: int64(2), object(3)
memory usage: 180.7+ KB
```

```
df.tail()
```

	order_id	quantity	item_name	choice_description	item_price
4617	1833	1	Steak Burrito	[Fresh Tomato Salsa, [Rice, Black Beans, Sour ...	$11.75
4618	1833	1	Steak Burrito	[Fresh Tomato Salsa, [Rice, Sour Cream, Cheese...	$11.75
4619	1834	1	Chicken Salad Bowl	[Fresh Tomato Salsa, [Fajita Vegetables, Pinto...	$11.25
4620	1834	1	Chicken Salad Bowl	[Fresh Tomato Salsa, [Fajita Vegetables, Lettu...	$8.75
4621	1834	1	Chicken Salad Bowl	[Fresh Tomato Salsa, [Fajita Vegetables, Pinto...	$8.75

```
#2. CSV
df=pd.read_table("course.csv",sep=",")
df.head()
```

	1	Mumbai	PQR institute .Pvt	BI	MH	9 Months
0	2	Delhi	ABC institute .Pvt.LTD	AI	UP	18 Months
1	3	Bengaluru	MNO institute .Ltd	Data Science	TN	11 Months
2	4	Bhopal	RST institute .Pvt.LTD	ML	MP	3 Months
3	5	Mumbai	EFG institute .Pvt.LTD	DL	MH	3 Months
4	6	Hyderabad	LMN institute	Could	AP	4 Months

```
df=pd.read_csv("course.csv")
df.head()
```

	1	Mumbai	PQR institute .Pvt	BI	MH	9 Months
0	2	Delhi	ABC institute .Pvt.LTD	AI	UP	18 Months
1	3	Bengaluru	MNO institute .Ltd	Data Science	TN	11 Months
2	4	Bhopal	RST institute .Pvt.LTD	ML	MP	3 Months
3	5	Mumbai	EFG institute .Pvt.LTD	DL	MH	3 Months
4	6	Hyderabad	LMN institute	Could	AP	4 Months

```
df=pd.read_excel("exbook.xlsx", sheet_name="Sheet1")
df.head()
```

	Sr.NO	Books	Author	year	Price	Profit
0	1	The Discovery of India	Jawaharlal Nehru	1946	599.95	0.30
1	2	The Story of my Experiments with Truth	Mahatma Gandhi	1927	159.00	0.30
2	3	Glimps of World History	J.Nehru	1934	750.46	0.24
3	4	A Guide to Health	Mahatma Gandhi	1921	250.00	0.25
4	5	Ignited Minds	APJ Abdul Kalam	2002	300.00	0.10

```
df=pd.read_excel("exbook.xlsx",0)
df.head()
```

	Sr.NO	Books	Author	year	Price	Profit
0	1	The Discovery of India	Jawaharlal Nehru	1946	599.95	0.30
1	2	The Story of my Experiments with Truth	Mahatma Gandhi	1927	159.00	0.30
2	3	Glimps of World History	J.Nehru	1934	750.46	0.24
3	4	A Guide to Health	Mahatma Gandhi	1921	250.00	0.25
4	5	Ignited Minds	APJ Abdul Kalam	2002	300.00	0.10

```
df=pd.read_csv("course.csv")
df.head()
```

	1	Mumbai	PQR institute .Pvt	BI	MH	9 Months
0	2	Delhi	ABC institute .Pvt.LTD	AI	UP	18 Months
1	3	Bengaluru	MNO institute .Ltd	Data Science	TN	11 Months
2	4	Bhopal	RST institute .Pvt.LTD	ML	MP	3 Months
3	5	Mumbai	EFG institute .Pvt.LTD	DL	MH	3 Months
4	6	Hyderabad	LMN institute	Could	AP	4 Months

```
#1. Adding Columns Name / Header

col=["Sr no", "City", "Coaching Center", "Courses", "State", "Course Duration"]
df=pd.read_csv("course.csv", header=None, names=col)
df.head()
```

	Sr no	City	Coaching Center	Courses	State	Course Duration
0	1	Mumbai	PQR institute .Pvt	BI	MH	9 Months
1	2	Delhi	ABC institute .Pvt.LTD	AI	UP	18 Months
2	3	Bengaluru	MNO institute .Ltd	Data Science	TN	11 Months
3	4	Bhopal	RST institute .Pvt.LTD	ML	MP	3 Months
4	5	Mumbai	EFG institute .Pvt.LTD	DL	MH	3 Months

```
df.City
```

	City
0	Mumbai
1	Delhi
2	Bengaluru
3	Bhopal
4	Mumbai
5	Hyderabad
6	Patna
7	Channai
8	Kolkata
9	Hyderabad
10	Bhopal
11	Pune
12	Delhi
13	Mumbai
14	Patna
15	Surat
16	Delhi
17	Mumbai
18	Pune
19	Bengaluru
20	Surat
21	Hyderabad
22	Mumbai
23	Channai
24	Patna

dtype: object

```
df.city
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
<ipython-input-33-3becfd86b043> in <cell line: 0>()
----> 1 df.city

/usr/local/lib/python3.11/dist-packages/pandas/core/generic.py in __getattr__(self, name)
   6297         ):
   6298             return self[name]
-> 6299         return object.__getattribute__(self, name)
   6300
   6301     @final

AttributeError: 'DataFrame' object has no attribute 'city'
```

```
df["Coaching Center"]
```

	Coaching Center
0	PQR institute .Pvt
1	ABC institute .Pvt.LTD
2	MNO institute .Ltd
3	RST institute .Pvt.LTD
4	EFG institute .Pvt.LTD
5	LMN institute
6	DEF institute .Ltd
7	PQR institute .Pvt.LTD
8	UVW institute .Ltd
9	GHI institute .Ltd
10	IJK institute
11	KLM institute .Ltd
12	STU institute .Ltd
13	XYZ institute .Pvt.LTD
14	NOP institute .Ltd
15	QRS institute .Ltd
16	WXY institute
17	ZAB institute
18	CDE institute .Ltd
19	JKL institute .Pvt.LTD
20	INS institute
21	ZAP institute .Ltd
22	XCAD institute .Pvt.LTD
23	MTK institute
24	BST institute .Ltd

dtype: object

```
df.City+","+df.State
```

	0
0	Mumbai,MH
1	Delhi,UP
2	Bengaluru,TN
3	Bhopal,MP
4	Mumbai,MH
5	Hyderabad,AP
6	Patna,BH
7	Channai,KT
8	Kolkata,WB
9	Hyderabad,AP
10	Bhopal,MP
11	Pune,MH
12	Delhi,UP
13	Mumbai,MH
14	Patna,BH
15	Surat,GJ
16	Delhi,UP
17	Mumbai,MH
18	Pune,MH
19	Bengaluru,TN
20	Surat,Gj
21	Hyderabad,AP
22	Mumbai,MH
23	Channai,KT
24	Patna,BH

dtype: object

```
df["Location"] = df['City']+", " + df.State
```

```
df.head()
```

	Sr no	City	Coaching Center	Courses	State	Course Duration	Location
0	1	Mumbai	PQR institute .Pvt	BI	MH	9 Months	Mumbai, MH
1	2	Delhi	ABC institute .Pvt.LTD	AI	UP	18 Months	Delhi, UP
2	3	Bengaluru	MNO institute .Ltd	Data Science	TN	11 Months	Bengaluru, TN
3	4	Bhopal	RST institute .Pvt.LTD	ML	MP	3 Months	Bhopal, MP
4	5	Mumbai	EFG institute .Pvt.LTD	DL	MH	3 Months	Mumbai, MH

```
#Deleting Column
df.drop("City", axis=1)
```

	Sr no	Coaching Center	Courses	State	Course Duration	Location
0	1	PQR institute .Pvt	BI	MH	9 Months	Mumbai, MH
1	2	ABC institute .Pvt.LTD	AI	UP	18 Months	Delhi, UP
2	3	MNO institute .Ltd	Data Science	TN	11 Months	Bengaluru, TN
3	4	RST institute .Pvt.LTD	ML	MP	3 Months	Bhopal, MP
4	5	EFG institute .Pvt.LTD	DL	MH	3 Months	Mumbai, MH
5	6	LMN institute	Could	AP	4 Months	Hyderabad, AP
6	7	DEF institute .Ltd	Web Serv	BH	4 Months	Patna, BH
7	8	PQR institute .Pvt.LTD	AWS	KT	3 Months	Channai, KT
8	9	UVW institute .Ltd	Networking	WB	3 Months	Kolkata, WB
9	10	GHI institute .Ltd	AI	AP	18 Months	Hyderabad, AP
10	11	IJK institute	DL	MP	3 Months	Bhopal, MP
11	12	KLM institute .Ltd	Data Science	MH	11 Months	Pune, MH
12	13	STU institute .Ltd	BI	UP	6 Months	Delhi, UP
13	14	XYZ institute .Pvt.LTD	Could	MH	3 Months	Mumbai, MH
14	15	NOP institute .Ltd	AWS	BH	3 Months	Patna, BH
15	16	QRS institute .Ltd	ML	GJ	3 Months	Surat, GJ
16	17	WXY institute	AWS	UP	3 Months	Delhi, UP
17	18	ZAB institute	Web Serv	MH	4 Months	Mumbai, MH
18	19	CDE institute .Ltd	Data Science	MH	11 Months	Pune, MH
19	20	JKL institute .Pvt.LTD	AI	TN	18 Months	Bengaluru, TN
20	21	INS institute	Data Science	Gj	11 Months	Surat, Gj
21	22	ZAP institute .Ltd	ML	AP	3 Months	Hyderabad, AP
22	23	XCAD institute .Pvt.LTD	DL	MH	3 Months	Mumbai, MH
23	24	MTK institute	Could	KT	4 Months	Channai, KT
24	25	BST institute .Ltd	Web Serv	BH	4 Months	Patna, BH

```
df
```

	Sr no	City	Coaching Center	Courses	State	Course Duration	Location
0	1	Mumbai	PQR institute .Pvt	BI	MH	9 Months	Mumbai, MH
1	2	Delhi	ABC institute .Pvt.LTD	AI	UP	18 Months	Delhi, UP
2	3	Bengaluru	MNO institute .Ltd	Data Science	TN	11 Months	Bengaluru, TN
3	4	Bhopal	RST institute .Pvt.LTD	ML	MP	3 Months	Bhopal, MP
4	5	Mumbai	EFG institute .Pvt.LTD	DL	MH	3 Months	Mumbai, MH
5	6	Hyderabad	LMN institute	Could	AP	4 Months	Hyderabad, AP
6	7	Patna	DEF institute .Ltd	Web Serv	BH	4 Months	Patna, BH
7	8	Channai	PQR institute .Pvt.LTD	AWS	KT	3 Months	Channai, KT
8	9	Kolkata	UVW institute .Ltd	Networking	WB	3 Months	Kolkata, WB
9	10	Hyderabad	GHI institute .Ltd	AI	AP	18 Months	Hyderabad, AP
10	11	Bhopal	IJK institute	DL	MP	3 Months	Bhopal, MP
11	12	Pune	KLM institute .Ltd	Data Science	MH	11 Months	Pune, MH
12	13	Delhi	STU institute .Ltd	BI	UP	6 Months	Delhi, UP
13	14	Mumbai	XYZ institute .Pvt.LTD	Could	MH	3 Months	Mumbai, MH
14	15	Patna	NOP institute .Ltd	AWS	BH	3 Months	Patna, BH
15	16	Surat	QRS institute .Ltd	ML	GJ	3 Months	Surat, GJ
16	17	Delhi	WXY institute	AWS	UP	3 Months	Delhi, UP
17	18	Mumbai	ZAB institute	Web Serv	MH	4 Months	Mumbai, MH
18	19	Pune	CDE institute .Ltd	Data Science	MH	11 Months	Pune, MH
19	20	Bengaluru	JKL institute .Pvt.LTD	AI	TN	18 Months	Bengaluru, TN
20	21	Surat	INS institute	Data Science	Gj	11 Months	Surat, Gj
21	22	Hyderabad	ZAP institute .Ltd	ML	AP	3 Months	Hyderabad, AP
22	23	Mumbai	XCAD institute .Pvt.LTD	DL	MH	3 Months	Mumbai, MH
23	24	Channai	MTK institute	Could	KT	4 Months	Channai, KT
24	25	Patna	BST institute .Ltd	Web Serv	BH	4 Months	Patna, BH

```
df
```

	Sr no	City	Coaching Center	Courses	State	Course Duration	Location
0	1	Mumbai	PQR institute .Pvt	BI	MH	9 Months	Mumbai, MH
1	2	Delhi	ABC institute .Pvt.LTD	AI	UP	18 Months	Delhi, UP
2	3	Bengaluru	MNO institute .Ltd	Data Science	TN	11 Months	Bengaluru, TN
3	4	Bhopal	RST institute .Pvt.LTD	ML	MP	3 Months	Bhopal, MP
4	5	Mumbai	EFG institute .Pvt.LTD	DL	MH	3 Months	Mumbai, MH
5	6	Hyderabad	LMN institute	Could	AP	4 Months	Hyderabad, AP
6	7	Patna	DEF institute .Ltd	Web Serv	BH	4 Months	Patna, BH
7	8	Channai	PQR institute .Pvt.LTD	AWS	KT	3 Months	Channai, KT
8	9	Kolkata	UVW institute .Ltd	Networking	WB	3 Months	Kolkata, WB
9	10	Hyderabad	GHI institute .Ltd	AI	AP	18 Months	Hyderabad, AP
10	11	Bhopal	IJK institute	DL	MP	3 Months	Bhopal, MP
11	12	Pune	KLM institute .Ltd	Data Science	MH	11 Months	Pune, MH
12	13	Delhi	STU institute .Ltd	BI	UP	6 Months	Delhi, UP
13	14	Mumbai	XYZ institute .Pvt.LTD	Could	MH	3 Months	Mumbai, MH
14	15	Patna	NOP institute .Ltd	AWS	BH	3 Months	Patna, BH
15	16	Surat	QRS institute .Ltd	ML	GJ	3 Months	Surat, GJ
16	17	Delhi	WXY institute	AWS	UP	3 Months	Delhi, UP
17	18	Mumbai	ZAB institute	Web Serv	MH	4 Months	Mumbai, MH
18	19	Pune	CDE institute .Ltd	Data Science	MH	11 Months	Pune, MH
19	20	Bengaluru	JKL institute .Pvt.LTD	AI	TN	18 Months	Bengaluru, TN
20	21	Surat	INS institute	Data Science	Gj	11 Months	Surat, Gj
21	22	Hyderabad	ZAP institute .Ltd	ML	AP	3 Months	Hyderabad, AP
22	23	Mumbai	XCAD institute .Pvt.LTD	DL	MH	3 Months	Mumbai, MH
23	24	Channai	MTK institute	Could	KT	4 Months	Channai, KT
24	25	Patna	BST institute .Ltd	Web Serv	BH	4 Months	Patna, BH

```
df.drop("City", axis=1, inplace=True)
df.head()
```

	Sr no	Coaching Center	Courses	State	Course Duration	Location
0	1	PQR institute .Pvt	BI	MH	9 Months	Mumbai, MH
1	2	ABC institute .Pvt.LTD	AI	UP	18 Months	Delhi, UP
2	3	MNO institute .Ltd	Data Science	TN	11 Months	Bengaluru, TN
3	4	RST institute .Pvt.LTD	ML	MP	3 Months	Bhopal, MP
4	5	EFG institute .Pvt.LTD	DL	MH	3 Months	Mumbai, MH

```
df.drop(["Courses", "State"], axis=1, inplace=True)
df.head()
```

	Sr no	Coaching Center	Course Duration	Location
0	1	PQR institute .Pvt	9 Months	Mumbai, MH
1	2	ABC institute .Pvt.LTD	18 Months	Delhi, UP
2	3	MNO institute .Ltd	11 Months	Bengaluru, TN
3	4	RST institute .Pvt.LTD	3 Months	Bhopal, MP
4	5	EFG institute .Pvt.LTD	3 Months	Mumbai, MH

```
#Deleting Rows

df.drop(2, axis=0, inplace=True)
df.head()
```

	Sr no	Coaching Center	Course Duration	Location
0	1	PQR institute .Pvt	9 Months	Mumbai, MH
1	2	ABC institute .Pvt.LTD	18 Months	Delhi, UP
3	4	RST institute .Pvt.LTD	3 Months	Bhopal, MP
4	5	EFG institute .Pvt.LTD	3 Months	Mumbai, MH
5	6	LMN institute	4 Months	Hyderabad, AP

```
df.drop([1,4,7,9], axis=0, inplace=True)
df.head(10)
```

	Sr no	Coaching Center	Course Duration	Location
0	1	PQR institute .Pvt	9 Months	Mumbai, MH
3	4	RST institute .Pvt.LTD	3 Months	Bhopal, MP
5	6	LMN institute	4 Months	Hyderabad, AP
6	7	DEF institute .Ltd	4 Months	Patna, BH
8	9	UVW institute .Ltd	3 Months	Kolkata, WB
10	11	IJK institute	3 Months	Bhopal, MP
11	12	KLM institute .Ltd	11 Months	Pune, MH
12	13	STU institute .Ltd	6 Months	Delhi, UP
13	14	XYZ institute .Pvt.LTD	3 Months	Mumbai, MH
14	15	NOP institute .Ltd	3 Months	Patna, BH

```
#Setting New Index

col=["Sr no", "City", "Coaching Center", "Courses", "State", "Course Duration"]
df=pd.read_csv("course.csv", header=None, names=col)
df.head()
```

	Sr no	City	Coaching Center	Courses	State	Course Duration
0	1	Mumbai	PQR institute .Pvt	BI	MH	9 Months
1	2	Delhi	ABC institute .Pvt.LTD	AI	UP	18 Months
2	3	Bengaluru	MNO institute .Ltd	Data Science	TN	11 Months
3	4	Bhopal	RST institute .Pvt.LTD	ML	MP	3 Months
4	5	Mumbai	EFG institute .Pvt.LTD	DL	MH	3 Months

```
df.set_index("Courses", inplace=True)
df.head()
```

Courses	Sr no	City	Coaching Center	State	Course Duration
BI	1	Mumbai	PQR institute .Pvt	MH	9 Months
AI	2	Delhi	ABC institute .Pvt.LTD	UP	18 Months
Data Science	3	Bengaluru	MNO institute .Ltd	TN	11 Months
ML	4	Bhopal	RST institute .Pvt.LTD	MP	3 Months
DL	5	Mumbai	EFG institute .Pvt.LTD	MH	3 Months

```
#Reseting the index

df.index.name = "Courses"
df.reset_index(inplace=True)
df.head()
```

	Courses	Sr no	City	Coaching Center	State	Course Duration
0	BI	1	Mumbai	PQR institute .Pvt	MH	9 Months
1	AI	2	Delhi	ABC institute .Pvt.LTD	UP	18 Months
2	Data Science	3	Bengaluru	MNO institute .Ltd	TN	11 Months
3	ML	4	Bhopal	RST institute .Pvt.LTD	MP	3 Months
4	DL	5	Mumbai	EFG institute .Pvt.LTD	MH	3 Months

```
type(df)
```

```
pandas.core.frame.DataFrame
def __init__(data=None, index: Axes | None=None, columns: Axes | None=None, dtype: Dtype |
None=None, copy: bool | None=None) -> None

Two-dimensional, size-mutable, potentially heterogeneous tabular data.

Data structure also contains labeled axes (rows and columns).
Arithmetic operations align on both row and column labels. Can be
thought of as a dict-like container for Series objects. The primary
pandas data structure.
```

```
pandas.core.frame.DataFrame
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-57-b52f2614ce3b> in <cell line: 0>()
----> 1 pandas.core.frame.DataFrame

NameError: name 'pandas' is not defined
```

```
type(df.City)
```

```
pandas.core.series.Series
def __init__(data=None, index=None, dtype: Dtype | None=None, name=None, copy: bool | None=None,
fastpath: bool | lib.NoDefault=lib.no_default) -> None

One-dimensional ndarray with axis labels (including time series).

Labels need not be unique but must be a hashable type. The object
supports both integer- and label-based indexing and provides a host of
methods for performing operations involving the index. Statistical
methods from ndarray have been overridden to automatically exclude
```

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

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-59-27567c86db69> in <cell line: 0>()
----> 1 pandas.core.series.Series

NameError: name 'pandas' is not defined
```

```
Start coding or generate with AI.
```

```
#Methods & Attributes in Pandas

df=pd.read_csv("movies.csv")
df.head()
```

	star_rating	title	content_rating	genre	duration	actors_list
0	9.3	The Shawshank Redemption	R	Crime	142	[u'Tim Robbins', u'Morgan Freeman', u'Bob Gunt...
1	9.2	The Godfather	R	Crime	175	[u'Marlon Brando', u'Al Pacino', u'James Caan']
2	9.1	The Godfather: Part II	R	Crime	200	[u'Al Pacino', u'Robert De Niro', u'Robert Duv...
3	9.0	The Dark Knight	PG-13	Action	152	[u'Christian Bale', u'Heath Ledger', u'Aaron E...
4	8.9	Pulp Fiction	R	Crime	154	[u'John Travolta', u'Uma Thurman', u'Samuel L....

```
df.tail()
```

	star_rating	title	content_rating	genre	duration	actors_list
974	7.4	Tootsie	PG	Comedy	116	[u'Dustin Hoffman', u'Jessica Lange', u'Teri G...
975	7.4	Back to the Future Part III	PG	Adventure	118	[u'Michael J. Fox', u'Christopher Lloyd', u'Ma...
976	7.4	Master and Commander: The Far Side of the World	PG-13	Action	138	[u'Russell Crowe', u'Paul Bettany', u'Billy Bo...

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 979 entries, 0 to 978
Data columns (total 6 columns):
 #   Column          Non-Null Count  Dtype  
---  ------          --------------  -----  
 0   star_rating     979 non-null    float64
 1   title           979 non-null    object 
 2   content_rating  976 non-null    object 
 3   genre           979 non-null    object 
 4   duration        979 non-null    int64  
 5   actors_list     979 non-null    object 
dtypes: float64(1), int64(1), object(4)
memory usage: 46.0+ KB
```

```
df.dtypes
```

	0
star_rating	float64
title	object
content_rating	object
genre	object
duration	int64
actors_list	object

dtype: object

```
df.shape
```

```
(979, 6)
```

```
df.columns
```

```
Index(['star_rating', 'title', 'content_rating', 'genre', 'duration',
       'actors_list'],
      dtype='object')
```

```
df.star_rating.mean()
```

```
7.889785495403474
```

```
df.star_rating.median()
```

```
7.8
```

```
df.star_rating.mode()
```

	star_rating
0	7.6

dtype: float64

```
df.star_rating.std()
```

```
0.336069326147959
```

```
df.star_rating.min()
```

```
7.4
```

```
df.star_rating.max()
```

```
9.3
```

```
df.describe()
```

	star_rating	duration
count	979.000000	979.000000
mean	7.889785	120.979571
std	0.336069	26.218010
min	7.400000	64.000000
25%	7.600000	102.000000
50%	7.800000	117.000000
75%	8.100000	134.000000
max	9.300000	242.000000

```
df.describe(include=["object"])
```

	title	content_rating	genre	actors_list
count	979	976	979	979
unique	975	12	16	969
top	Dracula	R	Drama	[u'Daniel Radcliffe', u'Emma Watson', u'Rupert...
freq	2	460	278	6

```
df.title.value_counts()
```

title	count
Dracula	2
The Girl with the Dragon Tattoo	2
Les Miserables	2
True Grit	2
The Shawshank Redemption	1
...	...
In the Heat of the Night	1
Nosferatu	1
Black Swan	1
Ratatouille	1
Wall Street	1

975 rows × 1 columns

dtype: int64

```
#Soring
```

```
df.head()
```

	star_rating	title	content_rating	genre	duration	actors_list
0	9.3	The Shawshank Redemption	R	Crime	142	[u'Tim Robbins', u'Morgan Freeman', u'Bob Gunt...
1	9.2	The Godfather	R	Crime	175	[u'Marlon Brando', u'Al Pacino', u'James Caan']
2	9.1	The Godfather: Part II	R	Crime	200	[u'Al Pacino', u'Robert De Niro', u'Robert Duv...
3	9.0	The Dark Knight	PG-13	Action	152	[u'Christian Bale', u'Heath Ledger', u'Aaron E...
4	8.9	Pulp Fiction	R	Crime	154	[u'John Travolta', u'Uma Thurman', u'Samuel L....

```
df.title.sort_values().head(20)
```

	title
542	(500) Days of Summer
5	12 Angry Men
201	12 Years a Slave
698	127 Hours
110	2001: A Space Odyssey
910	2046
596	21 Grams
624	25th Hour
708	28 Days Later...
60	3 Idiots
225	3-Iron
570	300
555	3:10 to Yuma
427	4 Months, 3 Weeks and 2 Days
824	42
597	50/50
203	8 1/2
170	A Beautiful Mind
941	A Bridge Too Far
571	A Bronx Tale

dtype: object

```
df.title.sort_values(ascending=False).head(20)
```

	title
864	[Rec]
526	Zulu
615	Zombieland
677	Zodiac
955	Zero Dark Thirty
535	Zelig
280	Young Frankenstein
96	Yojimbo
235	Yip Man
403	Ying xiong
695	Y Tu Mama Tambien
871	X2
532	X-Men: First Class
248	X-Men: Days of Future Past
954	X-Men
518	Wreck-It Ralph
970	Wonder Boys
65	Witness for the Prosecution
920	Witness
483	Withnail & I

dtype: object

```
df.sort_values("title").head(20)
```

	star_rating	title	content_rating	genre	duration	actors_list
542	7.8	(500) Days of Summer	PG-13	Comedy	95	[u'Zooey Deschanel', u'Joseph Gordon-Levitt', ...
5	8.9	12 Angry Men	NOT RATED	Drama	96	[u'Henry Fonda', u'Lee J. Cobb', u'Martin Bals...
201	8.1	12 Years a Slave	R	Biography	134	[u'Chiwetel Ejiofor', u'Michael Kenneth Willia...
698	7.6	127 Hours	R	Adventure	94	[u'James Franco', u'Amber Tamblyn', u'Kate Mara']
110	8.3	2001: A Space Odyssey	G	Mystery	160	[u'Keir Dullea', u'Gary Lockwood', u'William S...
910	7.5	2046	R	Drama	129	[u'Tony Chiu Wai Leung', u'Ziyi Zhang', u'Faye...
596	7.7	21 Grams	R	Crime	124	[u'Sean Penn', u'Benicio Del Toro', u'Naomi Wa...
624	7.7	25th Hour	R	Crime	135	[u'Edward Norton', u'Barry Pepper', u'Philip S...
708	7.6	28 Days Later	R	Horror	113	[u'Cillian Murphy', u'Naomie Harris', u'Christ...