



NUMPY

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

```
In [36]: arr1=np.array([1,2,3,4])
arr2=np.array([[1,2,3,4],[1,2,3,4]])
arr3=np.array([[[1,2,3,4],[2,2,3,4],[1,2,3,4]]])
arr4=np.array([4,3,2,1])
```

```
In [37]: print(arr1,arr2)
```

```
[1 2 3 4] [[1 2 3 4]
 [1 2 3 4]]
```

```
In [38]: print(np.ndim(arr1))
print(np.ndim(arr2))
print(np.ndim(arr3))
```

```
1
2
3
```

```
In [39]: print(arr3[0,1,0])
```

```
2
```

```
In [40]: print(np.unique(arr3))
```

```
[1 2 3 4]
```

```
In [41]: print(np.sort(arr1))
```

```
[1 2 3 4]
```

```
In [42]: print(arr1[2:4:1])
```

```
[3 4]
```

```
In [43]: print(np.shape(arr3))
```

```
(1, 3, 4)
```

```
In [53]: arr1=np.array([1,2,3,4])
arr2=np.array([[1,2,3,4],[1,2,3,4]])
arr3=np.array([[[1,2,3,4],[2,2,3,4],[1,2,3,4]]])
arr4=np.array([4,3,2,1])
print(np.concatenate((arr1,arr4)))
```

```
[1 2 3 4 4 3 2 1]
```

```
In [55]: arr5=np.array([[1,2,3,4],[0,9,8,7]])
arr6=np.array([[1,2,3,4],[0,9,8,7]])
print(np.concatenate((arr5,arr6)))
```

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

```
In [56]: print("YEah! I aM impRovINg")
```

```
YEah! I aM impRovINg
```

```
In [60]: print(np.array_split(arr4,5))
```

```
[array([4]), array([3]), array([2]), array([1]), array([], dtype=int64)]
```

```
In [66]: arr7=np.ravel(arr3)
print(arr7)
print(np.ndim(arr7))
print(np.shape(arr7))
```

```
[1 2 3 4 2 2 3 4 1 2 3 4]
1
(12,)
```

```
In [70]: print(np.unique(arr3, return_counts=True))
```

```
(array([1, 2, 3, 4]), array([2, 4, 3, 3]))
```

```
In [73]: arr3=np.delete(arr3,[2])
print(arr3)
```

```
[1 2 2 2 3 4 1 2 3 4]
```

```
In [74]: print(np.mean(arr3))
```

```
2.4
```

```
In [75]: print(np.median(arr3))
```

```
2.0
```

```
In [76]: print(np.std(arr3))
```

```
1.019803902718557
```

```
In [77]: print(np.sum(arr3))
```

```
24
```

```
In [78]: print(np.max(arr3))
```

```
4
```

```
In [79]: print(np.min(arr3))
```

```
1
```

```
In [85]: print(np.sort(arr1))
```

```
[1 2 3 4]
```

```
In [86]: print(arr1+arr1)
```

```
[2 4 6 8]
```

```
In [88]: print(arr2*arr2)
```

```
[[ 1  4  9 16]
 [ 1  4  9 16]]
```

```
In [90]: print(arr4-arr1)
```

```
[ 3  1 -1 -3]
```

```
In [92]: print(arr4/arr1)
```

```
[4.          1.5          0.66666667 0.25          ]
```

PANDAS

```
In [93]: import pandas as pd
```

```
In [96]: file=pd.read_csv("titanic (2).csv")
file
```

Out[96]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	211
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	175
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STC 31012
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	1138
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	3734
...	...	...	...	...	...	...	...	...	...
886	887	0	2	Montvila, Rev. Juozas	male	27.0	0	0	2115
887	888	1	1	Graham, Miss. Margaret Edith	female	19.0	0	0	1120
888	889	0	3	Johnston, Miss. Catherine Helen "Carrie"	female	NaN	1	2	W 66
889	890	1	1	Behr, Mr. Karl Howell	male	26.0	0	0	1113
890	891	0	3	Dooley, Mr. Patrick	male	32.0	0	0	3703

891 rows × 12 columns

In [97]: `file.head(10)`

Out[97]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450
5	6	0	3	Moran, Mr. James	male	NaN	0	0	330877
6	7	0	1	McCarthy, Mr. Timothy J	male	54.0	0	0	17463
7	8	0	3	Palsson, Master. Gosta Leonard	male	2.0	3	1	349909
8	9	1	3	Johnson, Mrs. Oscar W (Elisabeth Vilhelmina Berg)	female	27.0	0	2	347742
9	10	1	2	Nasser, Mrs. Nicholas (Adele Achem)	female	14.0	1	0	237736

In [98]: `file.tail(20)`

Out[98]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	
871	872	1	1	Beckwith, Mrs. Richard Leonard (Sallie Monypeny)	female	47.0	1	1	
872	873	0	1	Carlsson, Mr. Frans Olof	male	33.0	0	0	
873	874	0	3	Vander Cruyssen, Mr. Victor	male	47.0	0	0	:
874	875	1	2	Abelson, Mrs. Samuel (Hannah Witosky)	female	28.0	1	0	P/F
875	876	1	3	Najib, Miss. Adele Kiamie "Jane"	female	15.0	0	0	
876	877	0	3	Gustafsson, Mr. Alfred Ossian	male	20.0	0	0	
877	878	0	3	Petroff, Mr. Nedelio	male	19.0	0	0	:
878	879	0	3	Laleff, Mr. Kristo	male	NaN	0	0	:
879	880	1	1	Potter, Mrs. Thomas Jr (Lily Alexenia Wilson)	female	56.0	0	1	
880	881	1	2	Shelley, Mrs. William (Imanita Parrish Hall)	female	25.0	0	1	:
881	882	0	3	Markun, Mr. Johann	male	33.0	0	0	:
882	883	0	3	Dahlberg, Miss. Gerda Ulrika	female	22.0	0	0	
883	884	0	2	Banfield, Mr. Frederick	male	28.0	0	0	C.A./

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	
				James					
884	885	0	3	Sutehall, Mr. Henry Jr	male	25.0	0	0	SOT
885	886	0	3	Rice, Mrs. William (Margaret Norton)	female	39.0	0	5	:
886	887	0	2	Montvila, Rev. Juozas	male	27.0	0	0	:
887	888	1	1	Graham, Miss. Margaret Edith	female	19.0	0	0	:
888	889	0	3	Johnston, Miss. Catherine Helen "Carrie"	female	NaN	1	2	W./C
889	890	1	1	Behr, Mr. Karl Howell	male	26.0	0	0	:
890	891	0	3	Dooley, Mr. Patrick	male	32.0	0	0	:

In [100... file.info()

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 891 entries, 0 to 890
Data columns (total 12 columns):
#   Column      Non-Null Count  Dtype
---  -
0   PassengerId  891 non-null    int64
1   Survived     891 non-null    int64
2   Pclass       891 non-null    int64
3   Name         891 non-null    object
4   Sex          891 non-null    object
5   Age          714 non-null    float64
6   SibSp        891 non-null    int64
7   Parch        891 non-null    int64
8   Ticket       891 non-null    object
9   Fare         891 non-null    float64
10  Cabin        204 non-null    object
11  Embarked     889 non-null    object
dtypes: float64(2), int64(5), object(5)
memory usage: 83.7+ KB
```

In [101... file.describe()

Out[101...

	PassengerId	Survived	Pclass	Age	SibSp	Parch
count	891.000000	891.000000	891.000000	714.000000	891.000000	891.000000
mean	446.000000	0.383838	2.308642	29.699118	0.523008	0.381594
std	257.353842	0.486592	0.836071	14.526497	1.102743	0.806057
min	1.000000	0.000000	1.000000	0.420000	0.000000	0.000000
25%	223.500000	0.000000	2.000000	20.125000	0.000000	0.000000
50%	446.000000	0.000000	3.000000	28.000000	0.000000	0.000000
75%	668.500000	1.000000	3.000000	38.000000	1.000000	0.000000
max	891.000000	1.000000	3.000000	80.000000	8.000000	6.000000

In [110...

```
file.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 891 entries, 0 to 890
Data columns (total 12 columns):
#   Column      Non-Null Count  Dtype
---  -
0   PassengerId  891 non-null    int64
1   Survived     891 non-null    int64
2   Pclass       891 non-null    int64
3   Name         891 non-null    object
4   Sex          891 non-null    object
5   Age         714 non-null    float64
6   SibSp        891 non-null    int64
7   Parch        891 non-null    int64
8   Ticket       891 non-null    object
9   Fare         891 non-null    float64
10  Cabin        204 non-null    object
11  Embarked     889 non-null    object
dtypes: float64(2), int64(5), object(5)
memory usage: 83.7+ KB
```

In [114...

```
file[["Age"]]
```

Out[114...

	Age
0	22.0
1	38.0
2	26.0
3	35.0
4	35.0
...	...
886	27.0
887	19.0
888	NaN
889	26.0
890	32.0

891 rows × 1 columns

In [115...

```
file[['Age', 'Sex', 'SibSp']]
```

Out[115...

	Age	Sex	SibSp
0	22.0	male	1
1	38.0	female	1
2	26.0	female	0
3	35.0	female	1
4	35.0	male	0
...	...	...	...
886	27.0	male	0
887	19.0	female	0
888	NaN	female	1
889	26.0	male	0
890	32.0	male	0

891 rows × 3 columns

In [124...

```
pd.Series()
```

Out[124...

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

```
In [126... file.insert(loc=3, column ="ThinkNext", value="I Will")
```

```
In [127... file
```

```
Out[127...
```

	PassengerId	Survived	Pclass	ThinkNext	Name	Sex	Age	SibSp	I
0	1	0	3	I Will	Braund, Mr. Owen Harris	male	22.0	1	
1	2	1	1	I Will	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	
2	3	1	3	I Will	Heikkinen, Miss. Laina	female	26.0	0	
3	4	1	1	I Will	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	
4	5	0	3	I Will	Allen, Mr. William Henry	male	35.0	0	
...	...	...	...	...	...	...	...	...	...
886	887	0	2	I Will	Montvila, Rev. Juozas	male	27.0	0	
887	888	1	1	I Will	Graham, Miss. Margaret Edith	female	19.0	0	
888	889	0	3	I Will	Johnston, Miss. Catherine Helen "Carrie"	female	NaN	1	
889	890	1	1	I Will	Behr, Mr. Karl Howell	male	26.0	0	
890	891	0	3	I Will	Dooley, Mr. Patrick	male	32.0	0	

891 rows × 13 columns

```
In [130... file.drop("ThinkNext", axis=1, inplace=True)
```

```
In [144... lis=[1,2]
list1=(100,200)
pd.Series(list(list1), index=lis)
```

```
Out[144... 1    100
          2    200
dtype: int64
```

```
In [152... file.insert(loc=4, column ="Pendulam" ,value="i kNoW eVerYtHinG wELl")
```

```
In [153... file
```

Out[153...

	PassengerId	Survived	Pclass	Name	Pendulam	Sex	Age	SibSp	F
0	1	0	3	Braund, Mr. Owen Harris	i kNoW eVerYtHinG wEIL	male	22.0	1	
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	i kNoW eVerYtHinG wEIL	female	38.0	1	
2	3	1	3	Heikkinen, Miss. Laina	i kNoW eVerYtHinG wEIL	female	26.0	0	
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	i kNoW eVerYtHinG wEIL	female	35.0	1	
4	5	0	3	Allen, Mr. William Henry	i kNoW eVerYtHinG wEIL	male	35.0	0	
...	...	...	...	...	...	...	...	...	...
886	887	0	2	Montvila, Rev. Juozas	i kNoW eVerYtHinG wEIL	male	27.0	0	
887	888	1	1	Graham, Miss. Margaret Edith	i kNoW eVerYtHinG wEIL	female	19.0	0	
888	889	0	3	Johnston, Miss. Catherine Helen "Carrie"	i kNoW eVerYtHinG wEIL	female	NaN	1	
889	890	1	1	Behr, Mr. Karl Howell	i kNoW eVerYtHinG wEIL	male	26.0	0	
890	891	0	3	Dooley, Mr. Patrick	i kNoW eVerYtHinG wEIL	male	32.0	0	

891 rows × 13 columns

In [160...

```
file.drop("Pendulam", axis =1)
```

Out[160...

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	211536
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...)	female	38.0	1	0	17564
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/OJ 310128
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373451
...	...	...	...	...	...	...	...	...	...
886	887	0	2	Montvila, Rev. Juozas	male	27.0	0	0	211536
887	888	1	1	Graham, Miss. Margaret Edith	female	19.0	0	0	112052
888	889	0	3	Johnston, Miss. Catherine Helen "Carrie"	female	NaN	1	2	W/ 6616
889	890	1	1	Behr, Mr. Karl Howell	male	26.0	0	0	111369
890	891	0	3	Dooley, Mr. Patrick	male	32.0	0	0	370376

891 rows × 12 columns

In [203...

```
file.describe()
```

Out[203...

	PassengerId	Survived	Pclass	Age	SibSp	Parch
count	891.000000	891.000000	891.000000	714.000000	891.000000	891.000000
mean	446.000000	0.383838	2.308642	29.699118	0.523008	0.381594
std	257.353842	0.486592	0.836071	14.526497	1.102743	0.806057
min	1.000000	0.000000	1.000000	0.420000	0.000000	0.000000
25%	223.500000	0.000000	2.000000	20.125000	0.000000	0.000000
50%	446.000000	0.000000	3.000000	28.000000	0.000000	0.000000
75%	668.500000	1.000000	3.000000	38.000000	1.000000	0.000000
max	891.000000	1.000000	3.000000	80.000000	8.000000	6.000000

In [208...

```
print(type(file))
```

<class 'pandas.core.frame.DataFrame'>

In [209...

```
print(file)
```

	PassengerId	Survived	Pclass	\
0	1	0	3	
1	2	1	1	
2	3	1	3	
3	4	1	1	
4	5	0	3	
..	...	...	...	
886	887	0	2	
887	888	1	1	
888	889	0	3	
889	890	1	1	
890	891	0	3	

	Name	\
0	Braund, Mr. Owen Harris	
1	Cumings, Mrs. John Bradley (Florence Briggs Th...	
2	Heikkinen, Miss. Laina	
3	Futrelle, Mrs. Jacques Heath (Lily May Peel)	
4	Allen, Mr. William Henry	
..	...	
886	Montvila, Rev. Juozas	
887	Graham, Miss. Margaret Edith	
888	Johnston, Miss. Catherine Helen "Carrie"	
889	Behr, Mr. Karl Howell	
890	Dooley, Mr. Patrick	

	Pendulam	Sex	Age	SibSp	Parch	Ticket	\
0	i kNoW eVerYtHinG wELL	male	22.0	1	0	A/5 21171	
1	i kNoW eVerYtHinG wELL	female	38.0	1	0	PC 17599	
2	i kNoW eVerYtHinG wELL	female	26.0	0	0	STON/02. 3101282	
3	i kNoW eVerYtHinG wELL	female	35.0	1	0	113803	
4	i kNoW eVerYtHinG wELL	male	35.0	0	0	373450	
..	...	...	...	...	...	...	
886	i kNoW eVerYtHinG wELL	male	27.0	0	0	211536	
887	i kNoW eVerYtHinG wELL	female	19.0	0	0	112053	
888	i kNoW eVerYtHinG wELL	female	NaN	1	2	W./C. 6607	
889	i kNoW eVerYtHinG wELL	male	26.0	0	0	111369	
890	i kNoW eVerYtHinG wELL	male	32.0	0	0	370376	

	Fare	Cabin	Embarked
0	7.2500	NaN	S
1	71.2833	C85	C
2	7.9250	NaN	S
3	53.1000	C123	S
4	8.0500	NaN	S
..	...	...	...
886	13.0000	NaN	S
887	30.0000	B42	S
888	23.4500	NaN	S
889	30.0000	C148	C
890	7.7500	NaN	Q

[891 rows x 13 columns]

In [213... `print(file.columns)`

```
Index(['PassengerId', 'Survived', 'Pclass', 'Name', 'Pendulam', 'Sex', 'Age',
      'SibSp', 'Parch', 'Ticket', 'Fare', 'Cabin', 'Embarked'],
      dtype='object')
```

In [224... `print(file.columns)`
`file.set_index('Age', inplace=True)`
`file`

```
Index(['PassengerId', 'Survived', 'Pclass', 'Sex', 'Age', 'SibSp', 'Parch',
      'Ticket', 'Fare', 'Cabin', 'Embarked'],
      dtype='object')
```

Out[224... **PassengerId** **Survived** **Pclass** **Sex** **SibSp** **Parch** **Ticket** **Fare** **Ca**

Age

22.0	1	0	3	male	1	0	A/5 21171	7.2500	1
38.0	2	1	1	female	1	0	PC 17599	71.2833	0
26.0	3	1	3	female	0	0	STON/ O2. 3101282	7.9250	1
35.0	4	1	1	female	1	0	113803	53.1000	C
35.0	5	0	3	male	0	0	373450	8.0500	1
...	...	...	...	...	...	...	...	...	...
27.0	887	0	2	male	0	0	211536	13.0000	1
19.0	888	1	1	female	0	0	112053	30.0000	1
NaN	889	0	3	female	1	2	W./C. 6607	23.4500	1
26.0	890	1	1	male	0	0	111369	30.0000	C
32.0	891	0	3	male	0	0	370376	7.7500	1

891 rows × 10 columns

In [225... `file`

Out[225...

Age	PassengerId	Survived	Pclass	Sex	SibSp	Parch	Ticket	Fare	Ca
22.0	1	0	3	male	1	0	A/5 21171	7.2500	1
38.0	2	1	1	female	1	0	PC 17599	71.2833	0
26.0	3	1	3	female	0	0	STON/ O2. 3101282	7.9250	1
35.0	4	1	1	female	1	0	113803	53.1000	C
35.0	5	0	3	male	0	0	373450	8.0500	1
...	...	...	...	...	...	...	...	...	...
27.0	887	0	2	male	0	0	211536	13.0000	1
19.0	888	1	1	female	0	0	112053	30.0000	1
NaN	889	0	3	female	1	2	W./C. 6607	23.4500	1
26.0	890	1	1	male	0	0	111369	30.0000	C
32.0	891	0	3	male	0	0	370376	7.7500	1

891 rows × 10 columns

In [226...

```
file.dropna()
```

Out[226...

Age	PassengerId	Survived	Pclass	Sex	SibSp	Parch	Ticket	Fare	Cabin
38.0	2	1	1	female	1	0	PC 17599	71.2833	C101
35.0	4	1	1	female	1	0	113803	53.1000	C103
54.0	7	0	1	male	0	0	17463	51.8625	E46
4.0	11	1	3	female	1	1	PP 9549	16.7000	C101
58.0	12	1	1	female	0	0	113783	26.5500	C101
...	...	...	...	...	...	...	...	...	...
47.0	872	1	1	female	1	1	11751	52.5542	D101
33.0	873	0	1	male	0	0	695	5.0000	B31
56.0	880	1	1	female	0	1	11767	83.1583	C101
19.0	888	1	1	female	0	0	112053	30.0000	B31
26.0	890	1	1	male	0	0	111369	30.0000	C101

202 rows × 10 columns

In [227...

```
file.sort_index()
```

Out[227...

	PassengerId	Survived	Pclass	Sex	SibSp	Parch	Ticket	Fare	Cab
Age									
0.42	804	1	3	male	0	1	2625	8.5167	Na
0.67	756	1	2	male	1	1	250649	14.5000	Na
0.75	645	1	3	female	2	1	2666	19.2583	Na
0.75	470	1	3	female	2	1	2666	19.2583	Na
0.83	79	1	2	male	0	2	248738	29.0000	Na
...	...	...	...	...	...	...	...	...	...
NaN	860	0	3	male	0	0	2629	7.2292	Na
NaN	864	0	3	female	8	2	CA. 2343	69.5500	Na
NaN	869	0	3	male	0	0	345777	9.5000	Na
NaN	879	0	3	male	0	0	349217	7.8958	Na
NaN	889	0	3	female	1	2	W./C. 6607	23.4500	Na

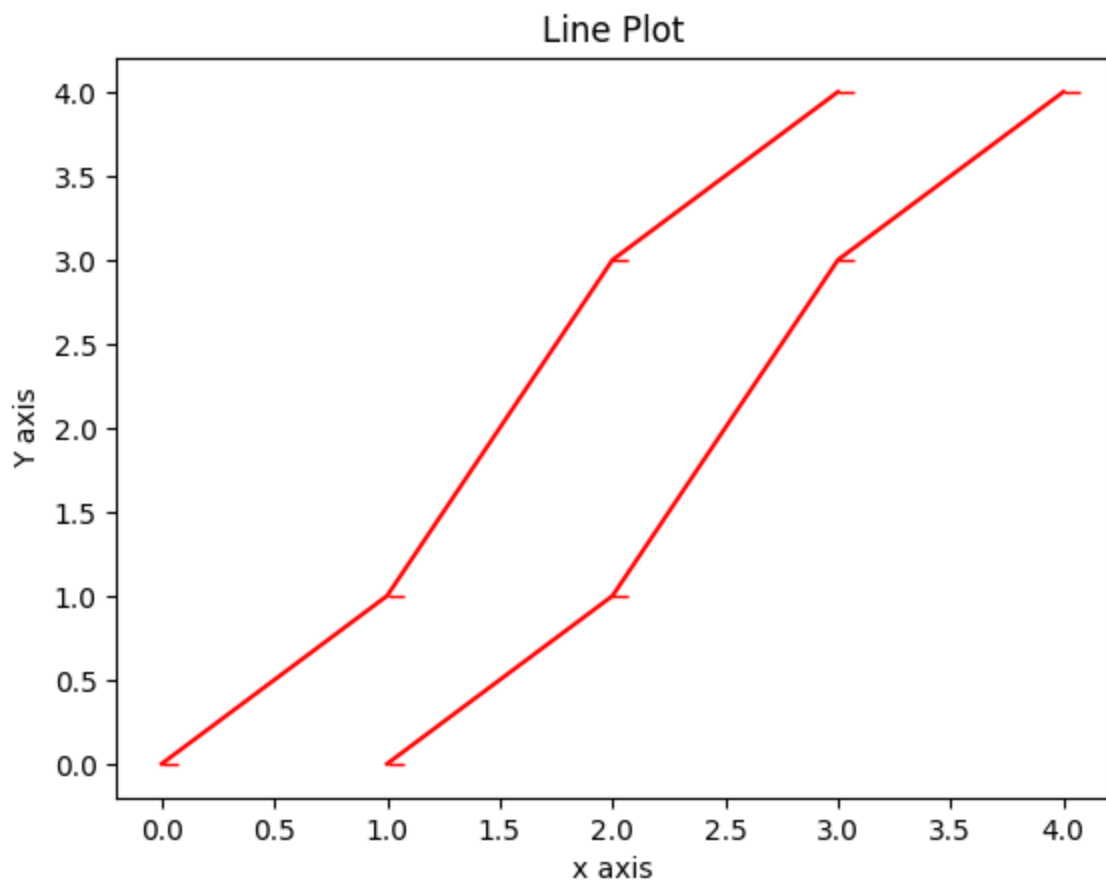
891 rows × 10 columns

In []: MATPLOTT

In [232... import matplotlib.pyplot as plt

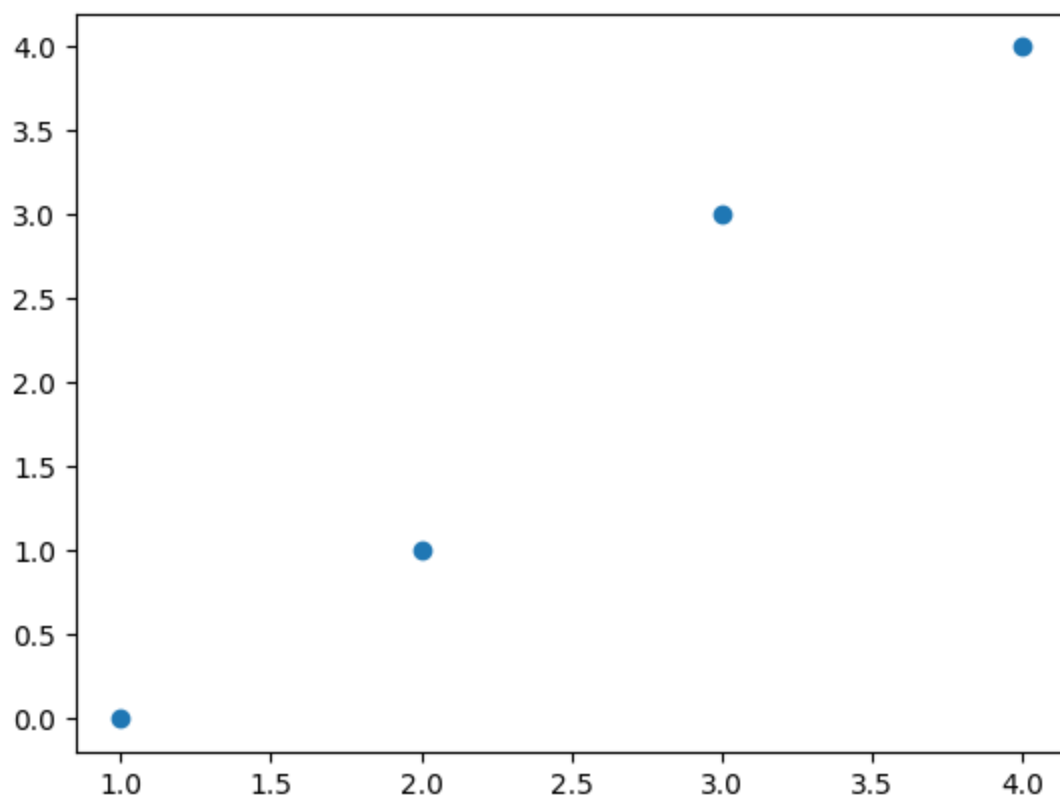
In [239...
x=[1,2,3,4]
y=[0,1,3,4]
plt.title("Line Plot")
plt.xlabel("x axis")
plt.ylabel("Y axis")
plt.plot(x,y ,z,marker=True,color='r')

Out[239... [<matplotlib.lines.Line2D at 0x1ba6ee5afd0>,
<matplotlib.lines.Line2D at 0x1ba6ee5b110>]



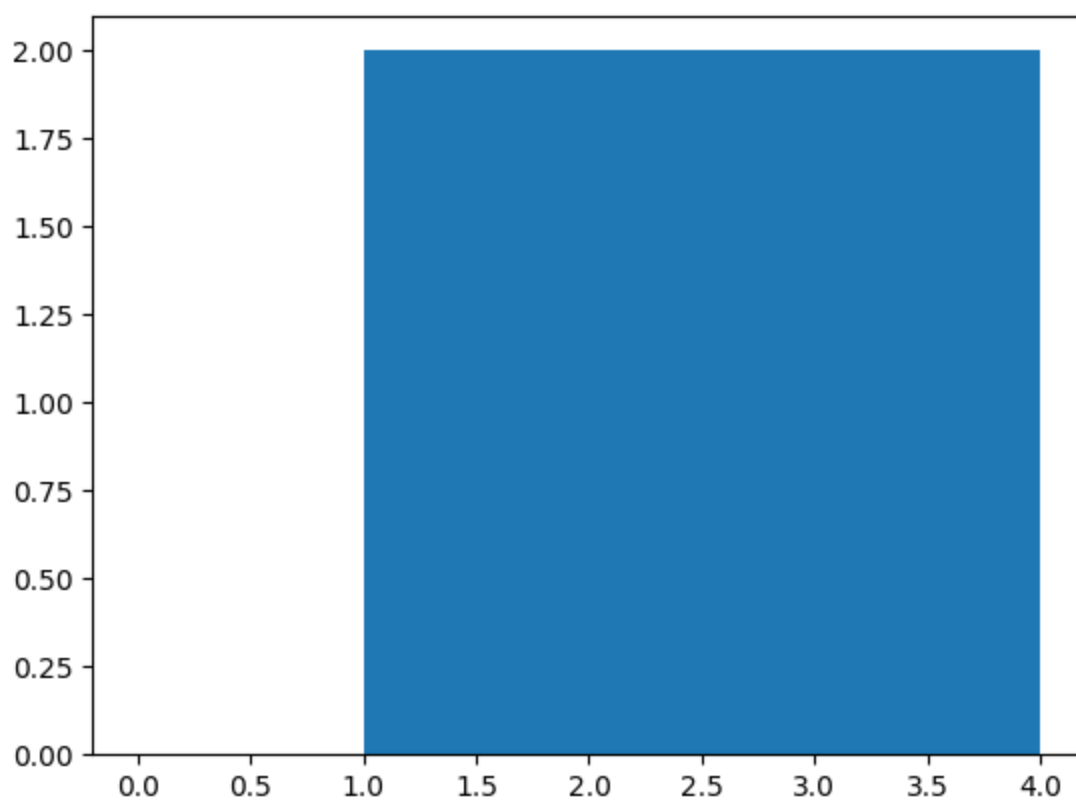
In [241... `plt.scatter(x,y)`

Out[241... `<matplotlib.collections.PathCollection at 0x1ba6eca42f0>`



```
In [242... plt.hist(x,y)
```

```
Out[242... (array([0., 2., 2.]),  
          array([0., 1., 3., 4.]),  
          <BarContainer object of 3 artists>)
```



In []: