

pandas

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```
[68]: import pandas as pd  
import matplotlib.pyplot as plt
```

```
[69]: print(pd.__version__)#print version
```

2.2.0

```
[70]: #create a series with index  
a=[1,2,3,4,5,6]  
s1=pd.Series(a,index=['i1','i2','i3','i4','i5','i6'])#print within a index  
s2=pd.Series(a)#print without index  
print(s1)  
print(s2)
```

```
i1    1  
i2    2  
i3    3  
i4    4  
i5    5  
i6    6  
dtype: int64  
0     1  
1     2  
2     3  
3     4  
4     5  
5     6  
dtype: int64
```

```
[71]: print(s1['i1'])#print the series as a index
```

1

```
[72]: #print the series in keyvalue pair  
keyvalue={"tej":85,"smitt":86,"xyz":1,"abc":23}  
newkey=pd.Series(keyvalue)  
print(newkey)
```

```
tej      85
smitt    86
xyz       1
abc      23
dtype: int64
```

```
[73]: #example of the Dataframe
student={'subject':['aiml','ccn','ws','cs'],
'marks':[90,89,70,99]}
Sstude=pd.DataFrame(student)
print(Sstude)
```

```
  subject  marks
0    aiml     90
1     ccn     89
2      ws     70
3      cs     99
```

```
[74]: #fetch sigle row in dataframe
print(Sstude.loc[3])
```

```
subject    cs
marks      99
Name: 3, dtype: object
```

```
[75]: #read the data from the csv file
studData=pd.read_csv('stdata.csv')
print(studData)
```

```
   sr  s_name birthdate   course  percentage
0   1   digu  15/11/02    MSCIT      81.0
1   2   smit  15/11/03      mca      86.0
2   3  navin  30/10/02      bba      85.0
3   4 jayesh  03/15/98    MSCIT      90.0
4   5  viral  20/04/99  electrical      70.0
5   6 sandip   24654      NaN       NaN
```

```
[76]: #print the first five record from the file
print(studData.head())
```

```
   sr  s_name birthdate   course  percentage
0   1   digu  15/11/02    MSCIT      81.0
1   2   smit  15/11/03      mca      86.0
2   3  navin  30/10/02      bba      85.0
3   4 jayesh  03/15/98    MSCIT      90.0
4   5  viral  20/04/99  electrical      70.0
```

```
[77]: #print the last five records from file
print(studData.tail())
```

	sr	s_name	birthdate	course	percentage
1	2	smit	15/11/03	mca	86.0
2	3	navin	30/10/02	bba	85.0
3	4	jayesh	03/15/98	MSCIT	90.0
4	5	viral	20/04/99	electrical	70.0
5	6	sandip	24654	NaN	NaN

```
[78]: #print the second number / location of the record
print(studData.loc[2])
```

```
sr          3
s_name      navin
birthdate   30/10/02
course      bba
percentage  85.0
Name: 2, dtype: object
```

```
[79]: # show the null, non-null values , datatypes and memory usage
print(studData.info())
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 6 entries, 0 to 5
Data columns (total 5 columns):
#   Column      Non-Null Count  Dtype
---  -
0   sr          6 non-null      int64
1   s_name      6 non-null      Object
2   birthdate   6 non-null      Object
3   course      5 non-null      Object
4   percentage  5 non-null      float64
dtypes: float64(1), int64(1), object(3)
memory usage: 368.0+ bytes
None
```

```
[80]: #drop a null value data from the records
newStudData=studData.dropna()
print(newStudData)
```

	sr	s_name	birthdate	course	percentage
0	1	digu	15/11/02	MSCIT	81.0
1	2	smit	15/11/03	mca	86.0
2	3	navin	30/10/02	bba	85.0
3	4	jayesh	03/15/98	MSCIT	90.0
4	5	viral	20/04/99	electrical	70.0

```
[81]: #replace value to the null values
filledStud=studData.fillna(30)
print(filledStud)
```

	sr	s_name	birthdate	course	percentage
0	1	digu	15/11/02	MSCIT	81.0
1	2	smit	15/11/03	mca	86.0
2	3	navin	30/10/02	bba	85.0
3	4	jayesh	03/15/98	MSCIT	90.0
4	5	viral	20/04/99	electrical	70.0
5	6	sandip	24654	30	30.0

```
[82]: #replace the null value according to the column
new=studData['course'].fillna('mca')
print(new)
```

```
0      MSCIT
1         mca
2         bba
3      MSCIT
4  electrical
5         mca
Name: course, dtype: object
```

```
[83]: # update the null record from the file with respect to the column
studData['course'].fillna('mca',inplace=True)
print(studData)
```

	sr	s_name	birthdate	course	percentage
0	1	digu	15/11/02	MSCIT	81.0
1	2	smit	15/11/03	mca	86.0
2	3	navin	30/10/02	bba	85.0
3	4	jayesh	03/15/98	MSCIT	90.0
4	5	viral	20/04/99	electrical	70.0
5	6	sandip	24654	mca	NaN

C:\Users\Sandy\AppData\Local\Temp\ipykernel_9464\2610228800.py:2: FutureWarning:
A value is trying to be set on a copy of a DataFrame or Series through chained
assignment using an inplace method.

The behavior will change in pandas 3.0. This inplace method will never work
because the intermediate object on which we are setting values always behaves as
a copy.

For example, when doing 'df[col].method(value, inplace=True)', try using
'df.method({col: value}, inplace=True)' or df[col] = df[col].method(value)
instead, to perform the operation inplace on the original object.

```
studData['course'].fillna('mca',inplace=True)
```

```
[84]: #mean.....
mean=studData["percentage"].mean()
print(f'mean:{mean}')
```

```
mean:82.4
```

```
[85]: #median.....
median=studData['percentage'].median()
print(f'median:{median}')
```

```
median:85.0
```

```
[86]: #mode.....
mode=studData['percentage'].mode()
print(f'mode:{mode}')
```

```
mode:0    70.0
```

```
1    81.0
```

```
2    85.0
```

```
3    86.0
```

```
4    90.0
```

```
Name: percentage, dtype: float64
```

```
[87]: #read a data from the csv file
pokemon = pd.read_csv('pokemon.csv')
print(pokemon)
```

	#	Name	Type 1	Type 2	Total	HP	Attack	Defense	\
0	1	Bulbasaur	Grass	Poison	318	45	49	49	
1	2	Ivysaur	Grass	Poison	405	60	62	63	
2	3	Venusaur	Grass	Poison	525	80	82	83	
3	3	VenusaurMega Venusaur	Grass	Poison	625	80	100	123	
4	4	Charmander	Fire	NaN	309	39	52	43	
--	
795	719	Diancie	Rock	Fairy	600	50	100	150	
796	719	DiancieMega Diancie	Rock	Fairy	700	50	160	110	
797	720	HoopaHoopa Confined	Psychic	Ghost	600	80	110	60	
798	720	HoopaHoopa Unbound	Psychic	Dark	680	80	160	60	
799	721	Volcanion	Fire	Water	600	80	110	120	

	Sp. Atk	Sp. Def	Speed	Generation	Legendary
0	65	65	45	1	False
1	80	80	60	1	False
2	100	100	80	1	False
3	122	120	80	1	False
4	60	50	65	1	False

795	100	150	50	6	True
796	160	110	110	6	True
797	150	130	70	6	True
798	170	130	80	6	True
799	130	90	70	6	True

[800 rows x 13 columns]

```
[88]: #sum the all column
pokemon["Totals"] = pokemon['HP']+pokemon['Attack']+pokemon['Defense']
pokemon.head(10)
```

```
[88]:  #      Name Type 1 Type 2 Total HP Attack Defense \
0  1      Bulbasaur Grass Poison 318 45 49 49
1  2      Ivysaur Grass Poison 405 60 62 63
2  3      Venusaur Grass Poison 525 80 82 83
3  3      VenusaurMega Venusaur Grass Poison 625 80 100 123
4  4      Charmander Fire NaN 309 39 52 43
5  5      Charmeleon Fire NaN 405 58 64 58
6  6      Charizard Fire Flying 534 78 84 78
7  6  CharizardMega Charizard X Fire Dragon 634 78 130 111
8  6  CharizardMega Charizard Y Fire Flying 634 78 104 78
9  7      Squirtle Water NaN 314 44 48 65
```

	Sp. Atk	Sp. Def	Speed	Generation	Legendary	Totals
0	65	65	45	1	False	143
1	80	80	60	1	False	185
2	100	100	80	1	False	245
3	122	120	80	1	False	303
4	60	50	65	1	False	134
5	80	65	80	1	False	180
6	109	85	100	1	False	240
7	130	85	100	1	False	319
8	159	115	100	1	False	260
9	50	64	43	1	False	157

```
[89]: #fetch the record from the csv file
print(pokemon.loc[323])
```

#	299
Name	Nosepass
Type 1	Rock
Type 2	NaN
Total	375
HP	30
Attack	45
Defense	135

```

Sp. Atk      45
Sp. Def      90
Speed        30
Generation   3
Legendary    False
Totals       210
Name: 323, dtype: object

```

```

[90]: #print the sepecific column from the csv file
print(pokemon['Name'])

```

```

0          Bulbasaur
1          Ivysaur
2          Venusaur
3  VenusaurMega Venusaur
4          Charmander

...

795          Diancie
796  DiancieMega Diancie
797  HoopaHoopa Confined
798  HoopaHoopa Unbound
799          Volcanion
Name: Name, Length: 800, dtype: object

```

```

[91]: #create a new column name avg in csv file
pokemon['Avg']=pokemon['Total']/4
print(pokemon)

```

	#	Name	Type 1	Type 2	Total	HP	Attack	Defense	\
0	1	Bulbasaur	Grass	Poison	318	45	49	49	
1	2	Ivysaur	Grass	Poison	405	60	62	63	
2	3	Venusaur	Grass	Poison	525	80	82	83	
3	3	VenusaurMega Venusaur	Grass	Poison	625	80	100	123	
4	4	Charmander	Fire	NaN	309	39	52	43	
..	
795	719	Diancie	Rock	Fairy	600	50	100	150	
796	719	DiancieMega Diancie	Rock	Fairy	700	50	160	110	
797	720	HoopaHoopa Confined	Psychic	Ghost	600	80	110	60	
798	720	HoopaHoopa Unbound	Psychic	Dark	680	80	160	60	
799	721	Volcanion	Fire	Water	600	80	110	120	

	Sp. Atk	Sp. Def	Speed	Generation	Legendary	Totals	Avg
0	65	65	45	1	False	143	79.50
1	80	80	60	1	False	185	101.25
2	100	100	80	1	False	245	131.25
3	122	120	80	1	False	303	156.25
4	60	50	65	1	False	134	77.25
..

795	100	150	50	6	True	300	150.00
796	160	110	110	6	True	320	175.00
797	150	130	70	6	True	250	150.00
798	170	130	80	6	True	300	170.00
799	130	90	70	6	True	310	150.00

[800 rows x 15 columns]

```
[92]: #create a new csv file
pokemon.to_csv('pokemon2.csv')
```

```
[93]: #fetch data from new csv file
pokemon=pd.read_csv('pokemon2.csv')
pokemon
```

```
[93]:
```

	Unnamed: 0	#	Name	Type 1	Type 2	Total	HP	\
0	0	1	Bulbasaur	Grass	Poison	318	45	
1	1	2	Ivysaur	Grass	Poison	405	60	
2	2	3	Venusaur	Grass	Poison	525	80	
3	3	3	VenusaurMega Venusaur	Grass	Poison	625	80	
4	4	4	Charmander	Fire	NaN	309	39	
--
795	795	719	Diancie	Rock	Fairy	600	50	
796	796	719	DiancieMega Diancie	Rock	Fairy	700	50	
797	797	720	HoopaHoop Confined	Psychic	Ghost	600	80	
798	798	720	HoopaHoop Unbound	Psychic	Dark	680	80	
799	799	721	Volcanion	Fire	Water	600	80	

	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation	Legendary	Totals	\
0	49	49	65	65	45	1	False	143	
1	62	63	80	80	60	1	False	185	
2	82	83	100	100	80	1	False	245	
3	100	123	122	120	80	1	False	303	
4	52	43	60	50	65	1	False	134	
--
795	100	150	100	150	50	6	True	300	
796	160	110	160	110	110	6	True	320	
797	110	60	150	130	70	6	True	250	
798	160	60	170	130	80	6	True	300	
799	110	120	130	90	70	6	True	310	

	Avg
0	79.50
1	101.25
2	131.25
3	156.25
4	77.25


```
-- ...
795 150.00
796 175.00
797 150.00
798 170.00
799 150.00
```

[800 rows x 16 columns]

```
[94]: #sort the data in csv file
pokemon.sort_values(['Avg'],ascending=1)
```

```
[94]: Unnamed: 0  # Name Type 1 Type 2 Total HP \
206 206 191 Sunkern Grass NaN 180 30
322 322 298 Azurill Normal Fairy 190 50
446 446 401 Kricketot Bug NaN 194 37
288 288 265 Wurmple Bug NaN 195 45
16 16 13 Weedle Bug Poison 195 40
-- ...
424 424 383 GroudonPrimal Groudon Ground Fire 770 100
422 422 382 KyogrePrimal Kyogre Water NaN 770 100
164 164 150 MewtwoMega Mewtwo Y Psychic NaN 780 106
426 426 384 RayquazaMega Rayquaza Dragon Flying 780 105
163 163 150 MewtwoMega Mewtwo X Psychic Fighting 780 106

Attack Defense Sp. Atk Sp. Def Speed Generation Legendary Totals \
206 30 30 30 30 30 2 False 90
322 20 40 20 40 20 3 False 110
446 25 41 25 41 25 4 False 103
288 45 35 20 30 20 3 False 125
16 35 30 20 20 50 1 False 105
-- ...
424 180 160 150 90 90 3 True 440
422 150 90 180 160 90 3 True 340
164 150 70 194 120 140 1 True 326
426 180 100 180 100 115 3 True 385
163 190 100 154 100 130 1 True 396

Avg
206 45.00
322 47.50
446 48.50
288 48.75
16 48.75
-- ...
424 192.50
422 192.50
```

```
164 195.00
426 195.00
163 195.00
```

[800 rows x 16 columns]

```
[95]: #first five record from csv file
pokemon.head(5)
```

```
[95]: Unnamed: 0  # Name Type 1 Type 2 Total HP Attack \
0 0 1 Bulbasaur Grass Poison 318 45 49
1 1 2 Ivysaur Grass Poison 405 60 62
2 2 3 Venusaur Grass Poison 525 80 82
3 3 3 VenusaurMega Venusaur Grass Poison 625 80 100
4 4 4 Charmander Fire NaN 309 39 52
```

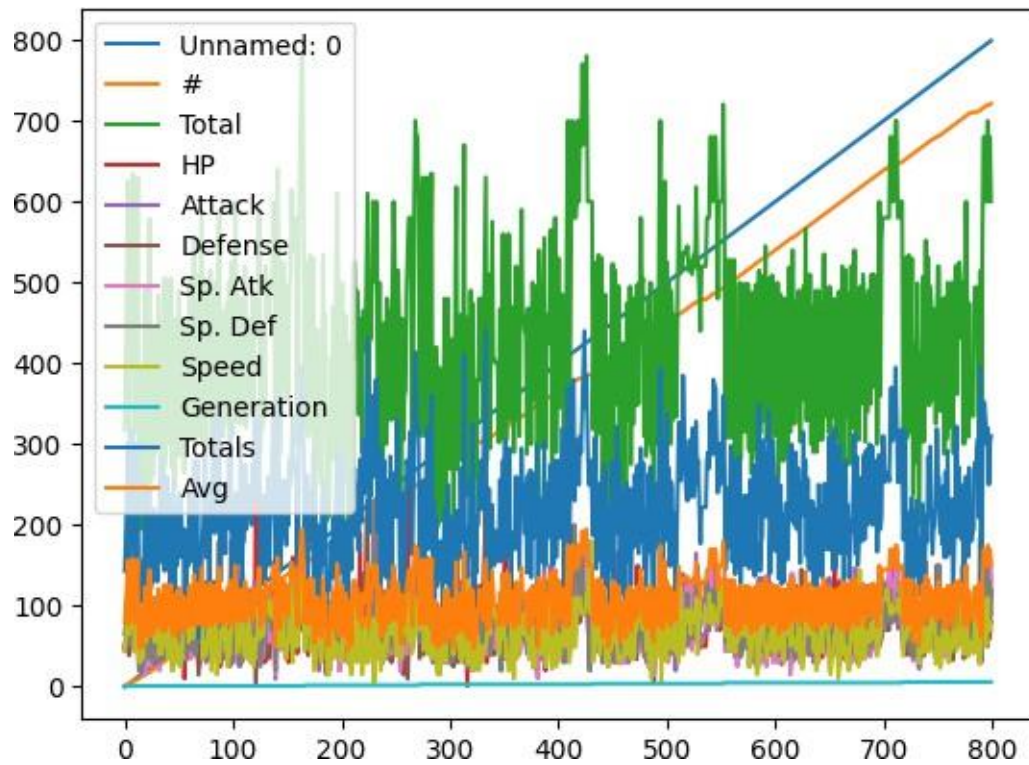
	Defense	Sp. Atk	Sp. Def	Speed	Generation	Legendary	Totals	Avg
0	49	65	65	45	1	False	143	79.50
1	63	80	80	60	1	False	185	101.25
2	83	100	100	80	1	False	245	131.25
3	123	122	120	80	1	False	303	156.25
4	43	60	50	65	1	False	134	77.25

```
[96]: #last five record from csv file
pokemon.tail(5)
```

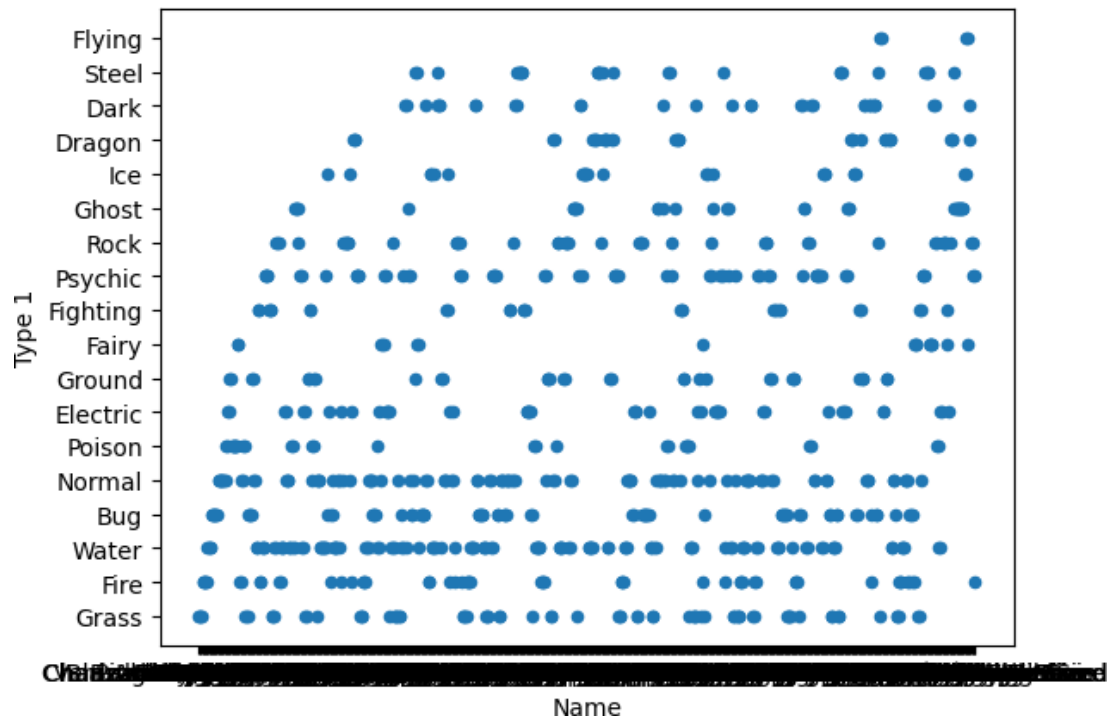
```
[96]: Unnamed: 0  # Name Type 1 Type 2 Total HP Attack \
795 795 719 Diancie Rock Fairy 600 50 100
796 796 719 DiancieMega Diancie Rock Fairy 700 50 160
797 797 720 HoopaHoopa Confined Psychic Ghost 600 80 110
798 798 720 HoopaHoopa Unbound Psychic Dark 680 80 160
799 799 721 Volcanion Fire Water 600 80 110
```

	Defense	Sp. Atk	Sp. Def	Speed	Generation	Legendary	Totals	Avg
795	150	100	150	50	6	True	300	150.0
796	110	160	110	110	6	True	320	175.0
797	60	150	130	70	6	True	250	150.0
798	60	170	130	80	6	True	300	170.0
799	120	130	90	70	6	True	310	150.0

```
[97]: pokemon.plot()
plt.show()
```

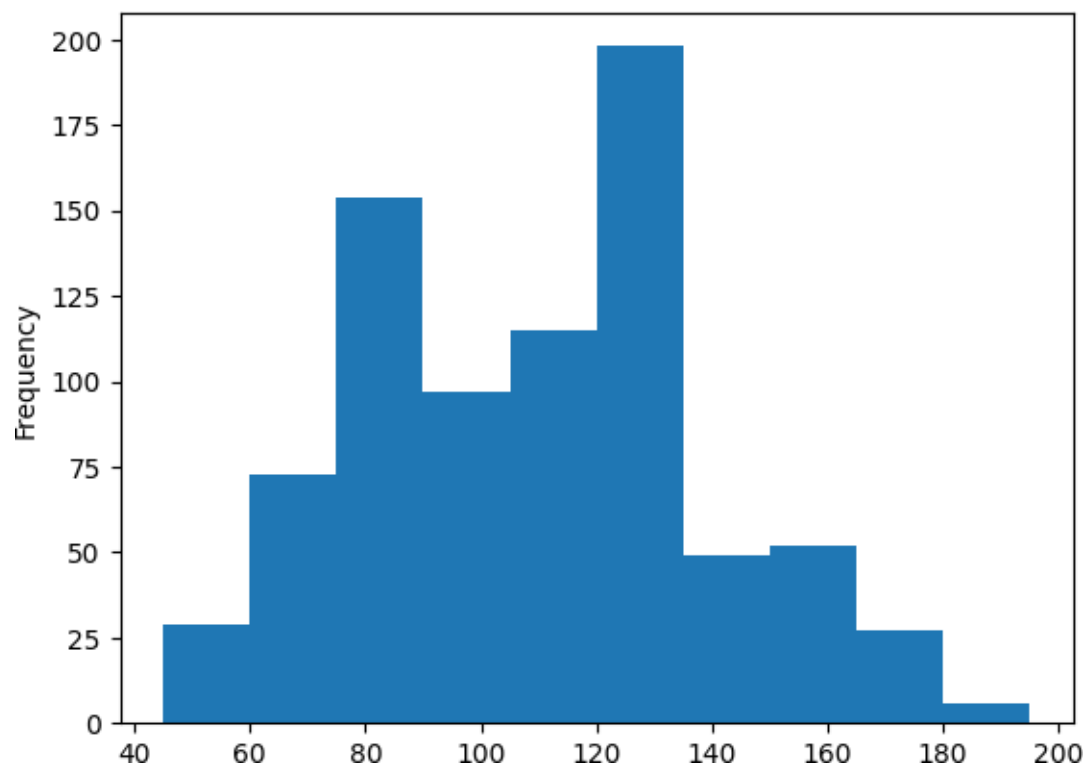


```
[98]: pokemon.plot(kind='scatter',x='Name',y='Type 1')
plt.show()
```



```
[99]: pokemon['Avg'].plot(kind='hist')
```

```
[99]: <Axes: ylabel='Frequency'>
```



[]: