panda

February 12, 2024

[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 withhin 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 keysvalue 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 dattaframe
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    HoopaHoopa Confined  Psychic   Ghost    600  80
798         798  720     HoopaHoopa 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]
```

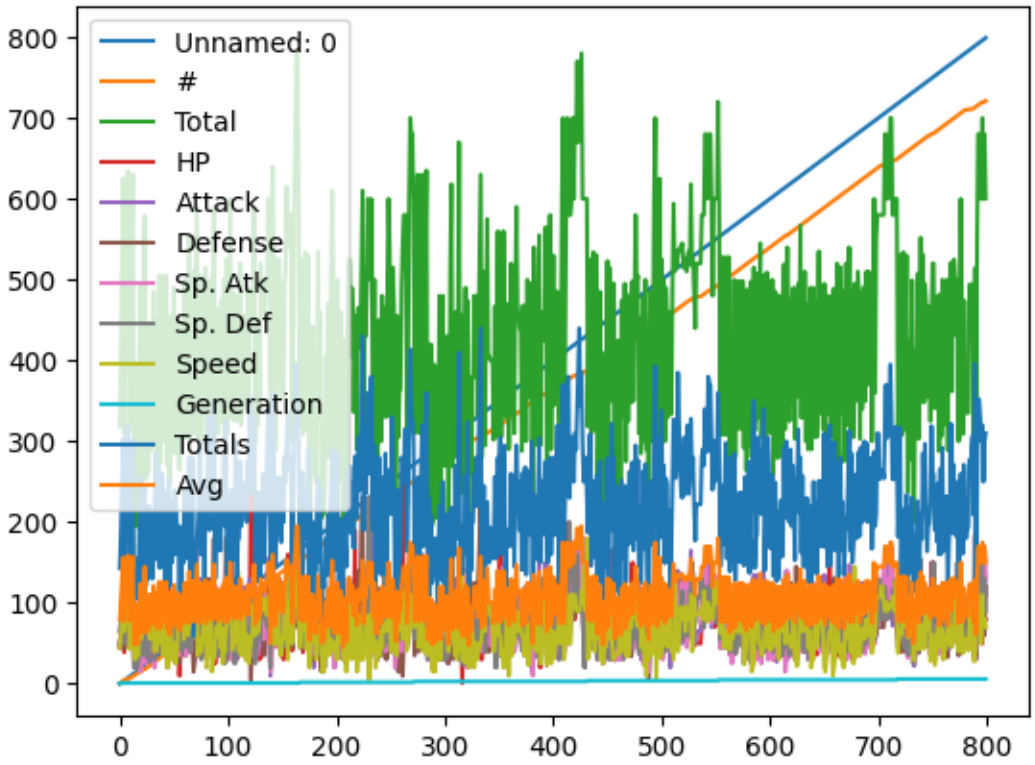
[95]:
```
#first five record from csv file
pokemon.head(5)
```

[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
```

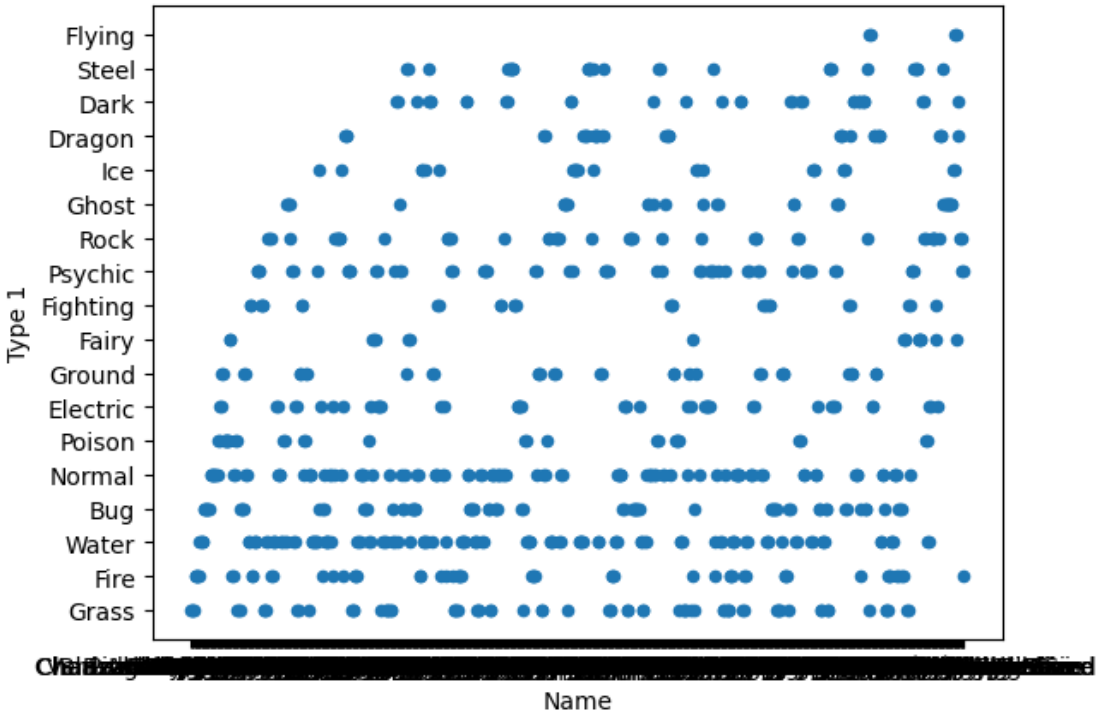
[96]:
```
#last five record from csv file
pokemon.tail(5)
```

[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()
```

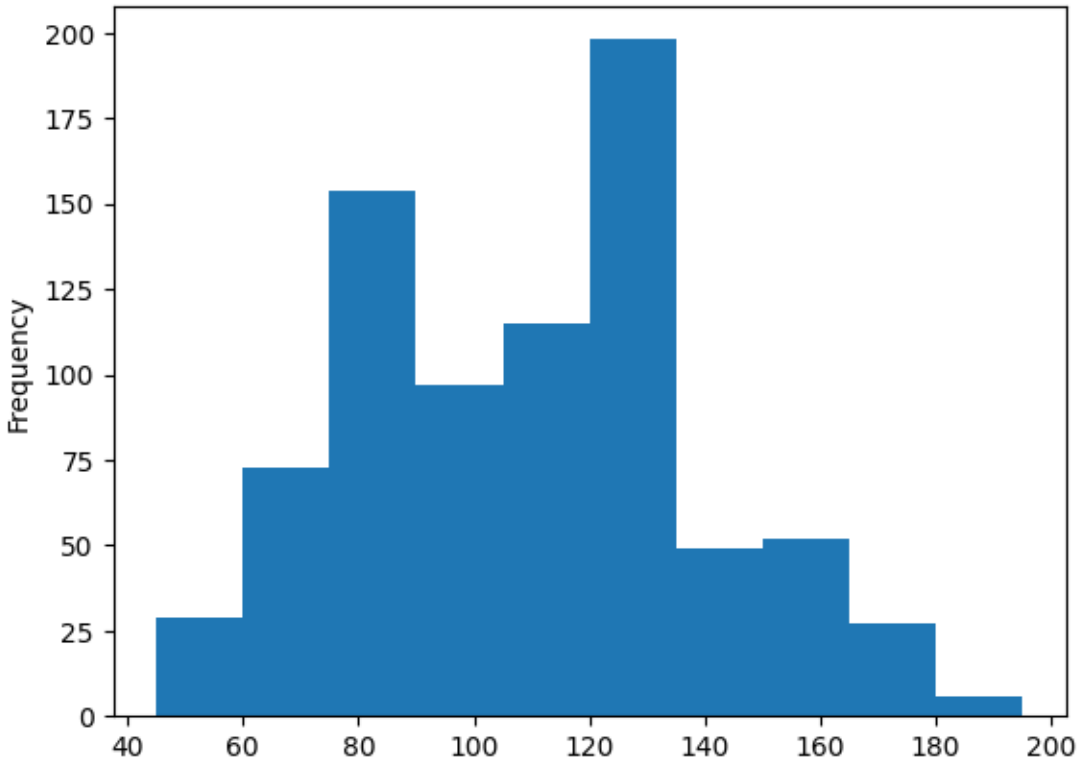


[98]:
```
pokemon.plot(kind='scatter',x='Name',y='Type 1')
plt.show()
```



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

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


Frequency
200
175
150
125
100
75
50
25
0
40
60
80
100
120
140
160
180
200

[ ]: