

Loading data into Pandas

In [335]:

```
import pandas as pd
```

In [336]:

```
df = pd.read_csv('pokemon_data.csv')
```

In [337]:

```
df.head(3)
```

Out[337]:

	#	Name	Type 1	Type 2	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation	Legendary
0	1	Bulbasaur	Grass	Poison	45	49	49	65	65	45	1	False
1	2	Ivysaur	Grass	Poison	60	62	63	80	80	60	1	False
2	3	Venusaur	Grass	Poison	80	82	83	100	100	80	1	False

In [338]:

```
df.tail(3)
```

Out[338]:

	#	Name	Type 1	Type 2	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation	Le
797	720	HoopaHoopa Confined	Psychic	Ghost	80	110	60	150	130	70	6	
798	720	HoopaHoopa Unbound	Psychic	Dark	80	160	60	170	130	80	6	
799	721	Volcanion	Fire	Water	80	110	120	130	90	70	6	

In [339]:

```
# df_xlsx = pd.read_excel('pokemon_data.xlsx')
# df_xlsx.head(3)
```

In [340]:

```
# df_txt = pd.read_csv('pokemon_data.txt', delimiter='\t')
# df_txt.head(5)
```

Reading data in Pandas

In [341]:

```
## Reading headers  
df.columns
```

Out[341]:

```
Index(['#', 'Name', 'Type 1', 'Type 2', 'HP', 'Attack', 'Defense', 'S  
p. Atk',  
      'Sp. Def', 'Speed', 'Generation', 'Legendary'],  
      dtype='object')
```

In [342]:

```
## Reading a specific column  
df['Name']
```

Out[342]:

```
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
```

In [343]:

```
df['Name'][0:5]
```

Out[343]:

```
0          Bulbasaur  
1          Ivysaur  
2          Venusaur  
3  VenusaurMega Venusaur  
4          Charmander  
Name: Name, dtype: object
```

In [344]:

```
df.Name
```

Out[344]:

```
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
```

In [345]:

```
df[['Name', 'Type 1', 'HP']]
```

Out[345]:

	Name	Type 1	HP
0	Bulbasaur	Grass	45
1	Ivysaur	Grass	60
2	Venusaur	Grass	80
3	VenusaurMega Venusaur	Grass	80
4	Charmander	Fire	39
...
795	Diancie	Rock	50
796	DiancieMega Diancie	Rock	50
797	HoopaHoopa Confined	Psychic	80
798	HoopaHoopa Unbound	Psychic	80
799	Volcanion	Fire	80

800 rows × 3 columns

In [346]:

```
# Reading rows
# first 5 rows
df.head(5)
```

Out[346]:

#	Name	Type 1	Type 2	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation	Legend	
0	1	Bulbasaur	Grass	Poison	45	49	49	65	65	45	1	F
1	2	Ivysaur	Grass	Poison	60	62	63	80	80	60	1	F
2	3	Venusaur	Grass	Poison	80	82	83	100	100	80	1	F
3	3	VenusaurMega Venusaur	Grass	Poison	80	100	123	122	120	80	1	F
4	4	Charmander	Fire	NaN	39	52	43	60	50	65	1	F

In [347]:

```
# Reading specific rows with indexing
df.iloc[1]
```

Out[347]:

```
#          2
Name      Ivysaur
Type 1    Grass
Type 2    Poison
HP        60
Attack    62
Defense   63
Sp. Atk   80
Sp. Def   80
Speed     60
Generation 1
Legendary  False
Name: 1, dtype: object
```

In [348]:

```
df.iloc[1:4]
```

Out[348]:

#	Name	Type 1	Type 2	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation	Legend
1 2	Ivysaur	Grass	Poison	60	62	63	80	80	60	1	F
2 3	Venusaur	Grass	Poison	80	82	83	100	100	80	1	F
3 3	VenusaurMega Venusaur	Grass	Poison	80	100	123	122	120	80	1	F

In [349]:

```
df.iloc[0:4]
```

Out[349]:

	#	Name	Type 1	Type 2	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation	Legend
0	1	Bulbasaur	Grass	Poison	45	49	49	65	65	45	1	F
1	2	Ivysaur	Grass	Poison	60	62	63	80	80	60	1	F
2	3	Venusaur	Grass	Poison	80	82	83	100	100	80	1	F
3	3	VenusaurMega Venusaur	Grass	Poison	80	100	123	122	120	80	1	F

In [350]:

```
# Reading a specing position
df.iloc[2, 1]
```

Out[350]:

'Venusaur'

In [351]:

```
df.iloc[2, 5]
```

Out[351]:

82

In [352]:

```
# Read each row
for index, row in df.iterrows():
    print(index, row)
```

```
0 # 1
Name Bulbasaur
Type 1 Grass
Type 2 Poison
HP 45
Attack 49
Defense 49
Sp. Atk 65
Sp. Def 65
Speed 45
Generation 1
Legendary False
Name: 0, dtype: object
1 # 2
Name Ivysaur
Type 1 Grass
Type 2 Poison
HP 60
Attack 62
Defense 63
```

In [353]:

```
for index, row in df.iterrows():  
    print(index, row['Name'])
```

```
0 Bulbasaur  
1 Ivysaur  
2 Venusaur  
3 VenusaurMega Venusaur  
4 Charmander  
5 Charmeleon  
6 Charizard  
7 CharizardMega Charizard X  
8 CharizardMega Charizard Y  
9 Squirtle  
10 Wartortle  
11 Blastoise  
12 BlastoiseMega Blastoise  
13 Caterpie  
14 Metapod  
15 Butterfree  
16 Weedle  
17 Kakuna  
18 Beedrill  
19 BeedrillMega Beedrill
```

In [354]:

```
df.loc[df['Type 1'] == 'Fire']
```

Out[354]:

	#	Name	Type 1	Type 2	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generati
4	4	Charmander	Fire	NaN	39	52	43	60	50	65	
5	5	Charmeleon	Fire	NaN	58	64	58	80	65	80	
6	6	Charizard	Fire	Flying	78	84	78	109	85	100	
7	6	CharizardMega Charizard X	Fire	Dragon	78	130	111	130	85	100	
8	6	CharizardMega Charizard Y	Fire	Flying	78	104	78	159	115	100	
42	37	Vulpix	Fire	NaN	38	41	40	50	65	65	
43	38	Ninetales	Fire	NaN	73	76	75	81	100	100	
63	58	Growlithe	Fire	NaN	55	70	45	70	50	60	
64	59	Arcanine	Fire	NaN	90	110	80	100	80	95	
83	77	Ponyta	Fire	NaN	50	85	55	65	65	90	
84	78	Rapidash	Fire	NaN	65	100	70	80	80	105	
135	126	Magmar	Fire	NaN	65	95	57	100	85	93	
147	136	Flareon	Fire	NaN	65	130	60	95	110	65	
158	146	Moltres	Fire	Flying	90	100	90	125	85	90	
169	155	Cyndaquil	Fire	NaN	39	52	43	60	50	65	
170	156	Quilava	Fire	NaN	58	64	58	80	65	80	
171	157	Typhlosion	Fire	NaN	78	84	78	109	85	100	
236	218	Slugma	Fire	NaN	40	40	40	70	40	20	
237	219	Magcargo	Fire	Rock	50	50	120	80	80	30	
259	240	Magby	Fire	NaN	45	75	37	70	55	83	
263	244	Entei	Fire	NaN	115	115	85	90	75	100	
270	250	Ho-oh	Fire	Flying	106	130	90	110	154	90	
276	255	Torchic	Fire	NaN	45	60	40	70	50	45	
277	256	Combusken	Fire	Fighting	60	85	60	85	60	55	
278	257	Blaziken	Fire	Fighting	80	120	70	110	70	80	
279	257	BlazikenMega Blaziken	Fire	Fighting	80	160	80	130	80	100	
352	322	Numel	Fire	Ground	60	60	40	65	45	35	
353	323	Camerupt	Fire	Ground	70	100	70	105	75	40	
354	323	CameruptMega Camerupt	Fire	Ground	70	120	100	145	105	20	
355	324	Torkoal	Fire	NaN	70	85	140	85	70	20	
435	390	Chimchar	Fire	NaN	44	58	44	58	44	61	
436	391	Monferno	Fire	Fighting	64	78	52	78	52	81	

	#	Name	Type 1	Type 2	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generati
437	392	Infernape	Fire	Fighting	76	104	71	104	71	108	
518	467	Magmortar	Fire	NaN	75	95	67	125	95	83	
542	485	Heatran	Fire	Steel	91	90	106	130	106	77	
557	498	Tepig	Fire	NaN	65	63	45	45	45	45	
558	499	Pignite	Fire	Fighting	90	93	55	70	55	55	
559	500	Emboar	Fire	Fighting	110	123	65	100	65	65	
572	513	Pansear	Fire	NaN	50	53	48	53	48	64	
573	514	Simisear	Fire	NaN	75	98	63	98	63	101	
614	554	Darumaka	Fire	NaN	70	90	45	15	45	50	
615	555	DarmanitanStandard Mode	Fire	NaN	105	140	55	30	55	95	
616	555	DarmanitanZen Mode	Fire	Psychic	105	30	105	140	105	55	
692	631	Heatmor	Fire	NaN	85	97	66	105	66	65	
721	653	Fennekin	Fire	NaN	40	45	40	62	60	60	
722	654	Braixen	Fire	NaN	59	59	58	90	70	73	
723	655	Delphox	Fire	Psychic	75	69	72	114	100	104	
730	662	Fletchinder	Fire	Flying	62	73	55	56	52	84	
731	663	Talonflame	Fire	Flying	78	81	71	74	69	126	
735	667	Litleo	Fire	Normal	62	50	58	73	54	72	
736	668	Pyroar	Fire	Normal	86	68	72	109	66	106	
799	721	Volcanion	Fire	Water	80	110	120	130	90	70	

Sorting/Describing data

In [355]:

```
df.describe()
```

Out[355]:

	#	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation
count	800.000000	800.000000	800.000000	800.000000	800.000000	800.000000	800.000000	800.000000
mean	362.813750	69.258750	79.001250	73.842500	72.820000	71.902500	68.277500	362.813750
std	208.343798	25.534669	32.457366	31.183501	32.722294	27.828916	29.060474	208.343798
min	1.000000	1.000000	5.000000	5.000000	10.000000	20.000000	5.000000	1.000000
25%	184.750000	50.000000	55.000000	50.000000	49.750000	50.000000	45.000000	184.750000
50%	364.500000	65.000000	75.000000	70.000000	65.000000	70.000000	65.000000	364.500000
75%	539.250000	80.000000	100.000000	90.000000	95.000000	90.000000	90.000000	539.250000
max	721.000000	255.000000	190.000000	230.000000	194.000000	230.000000	180.000000	721.000000

In [356]:

```
df.sort_values('Name', ascending=False)
```

Out[356]:

	#	Name	Type 1	Type 2	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation
794	718	Zygarde50% Forme	Dragon	Ground	108	100	121	81	95	95	
695	634	Zweilous	Dark	Dragon	72	85	70	65	70	58	
46	41	Zubat	Poison	Flying	40	45	35	30	40	55	
631	570	Zorua	Dark	NaN	40	65	40	80	40	65	
632	571	Zoroark	Dark	NaN	60	105	60	120	60	105	
...	
393	359	AbsolMega Absol	Dark	NaN	65	150	60	115	60	115	
392	359	Absol	Dark	NaN	65	130	60	75	60	75	
68	63	Abra	Psychic	NaN	25	20	15	105	55	90	
511	460	AbomasnowMega Abomasnow	Grass	Ice	90	132	105	132	105	30	
510	460	Abomasnow	Grass	Ice	90	92	75	92	85	60	

800 rows × 12 columns

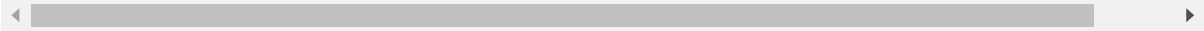
In [357]:

```
df.sort_values(['Type 1', 'HP'])
```

Out[357]:

	#	Name	Type 1	Type 2	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation	Legs
316	292	Shedinja	Bug	Ghost	1	90	45	30	30	40	3	
230	213	Shuckle	Bug	Rock	20	10	230	10	230	5	2	
462	415	Combee	Bug	Flying	30	30	42	30	42	70	4	
603	543	Venipede	Bug	Poison	30	45	59	30	39	57	5	
314	290	Nincada	Bug	Ground	31	45	90	30	30	40	3	
...
142	131	Lapras	Water	Ice	130	85	80	85	95	60	1	
145	134	Vaporeon	Water	NaN	130	65	60	110	95	65	1	
350	320	Wailmer	Water	NaN	130	70	35	70	35	60	3	
655	594	Alomomola	Water	NaN	165	75	80	40	45	65	5	
351	321	Wailord	Water	NaN	170	90	45	90	45	60	3	

800 rows × 12 columns



In [358]:

```
df.sort_values(['Type 1', 'HP'], ascending=[1,0])
```

Out[358]:

	#	Name	Type 1	Type 2	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation
520	469	Yanmega	Bug	Flying	86	76	86	116	56	95	4
698	637	Volcarona	Bug	Fire	85	60	65	135	105	100	5
231	214	Heracross	Bug	Fighting	80	125	75	40	95	85	2
232	214	HeracrossMega Heracross	Bug	Fighting	80	185	115	40	105	75	2
678	617	Accelgor	Bug	NaN	80	70	40	100	60	145	5
...
106	98	Krabby	Water	NaN	30	105	90	25	25	50	1
125	116	Horsea	Water	NaN	30	40	70	70	25	60	1
129	120	Staryu	Water	NaN	30	45	55	70	55	85	1
139	129	Magikarp	Water	NaN	20	10	55	15	20	80	1
381	349	Feebas	Water	NaN	20	15	20	10	55	80	3

800 rows × 12 columns



Making changes to data

In [359]:

```
df.head(5)
```

Out[359]:

	#	Name	Type 1	Type 2	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation	Legendary
0	1	Bulbasaur	Grass	Poison	45	49	49	65	65	45	1	F
1	2	Ivysaur	Grass	Poison	60	62	63	80	80	60	1	F
2	3	Venusaur	Grass	Poison	80	82	83	100	100	80	1	F
3	3	VenusaurMega Venusaur	Grass	Poison	80	100	123	122	120	80	1	F
4	4	Charmander	Fire	NaN	39	52	43	60	50	65	1	F



In [360]:

```
df['Total'] = df['HP'] + df['Attack'] + df['Defense'] + df['Sp. Atk'] + df['Sp. Def']
df
```

Out[360]:

	#	Name	Type 1	Type 2	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation
0	1	Bulbasaur	Grass	Poison	45	49	49	65	65	45	1
1	2	Ivysaur	Grass	Poison	60	62	63	80	80	60	1
2	3	Venusaur	Grass	Poison	80	82	83	100	100	80	1
3	3	VenusaurMega Venusaur	Grass	Poison	80	100	123	122	120	80	1
4	4	Charmander	Fire	NaN	39	52	43	60	50	65	1
...
795	719	Diancie	Rock	Fairy	50	100	150	100	150	50	6
796	719	DiancieMega Diancie	Rock	Fairy	50	160	110	160	110	110	6
797	720	HoopaHoopa Confined	Psychic	Ghost	80	110	60	150	130	70	6
798	720	HoopaHoopa Unbound	Psychic	Dark	80	160	60	170	130	80	6
799	721	Volcanion	Fire	Water	80	110	120	130	90	70	6

800 rows × 13 columns



In [361]:

```
df.drop(columns=['Total'])
```

Out[361]:

	#	Name	Type 1	Type 2	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation
0	1	Bulbasaur	Grass	Poison	45	49	49	65	65	45	1
1	2	Ivysaur	Grass	Poison	60	62	63	80	80	60	1
2	3	Venusaur	Grass	Poison	80	82	83	100	100	80	1
3	3	VenusaurMega Venusaur	Grass	Poison	80	100	123	122	120	80	1
4	4	Charmander	Fire	NaN	39	52	43	60	50	65	1
...
795	719	Diancie	Rock	Fairy	50	100	150	100	150	50	6
796	719	DiancieMega Diancie	Rock	Fairy	50	160	110	160	110	110	6
797	720	HoopaHoopa Confined	Psychic	Ghost	80	110	60	150	130	70	6
798	720	HoopaHoopa Unbound	Psychic	Dark	80	160	60	170	130	80	6
799	721	Volcanion	Fire	Water	80	110	120	130	90	70	6

800 rows × 12 columns



In [362]:

```
df['Total'] = df.iloc[:, 4:10].sum(axis=1)
df
```

Out[362]:

	#	Name	Type 1	Type 2	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation
0	1	Bulbasaur	Grass	Poison	45	49	49	65	65	45	1
1	2	Ivysaur	Grass	Poison	60	62	63	80	80	60	1
2	3	Venusaur	Grass	Poison	80	82	83	100	100	80	1
3	3	VenusaurMega Venusaur	Grass	Poison	80	100	123	122	120	80	1
4	4	Charmander	Fire	NaN	39	52	43	60	50	65	1
...
795	719	Diancie	Rock	Fairy	50	100	150	100	150	50	6
796	719	DiancieMega Diancie	Rock	Fairy	50	160	110	160	110	110	6
797	720	HoopaHoopa Confined	Psychic	Ghost	80	110	60	150	130	70	6
798	720	HoopaHoopa Unbound	Psychic	Dark	80	160	60	170	130	80	6
799	721	Volcanion	Fire	Water	80	110	120	130	90	70	6

800 rows × 13 columns



In [363]:

```
cols = list(df.columns.values)
df = df[cols[0:4] + [cols[-1]] + cols[4:12]]
df
```

Out[363]:

	#	Name	Type 1	Type 2	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Gener
0	1	Bulbasaur	Grass	Poison	318	45	49	49	65	65	45	
1	2	Ivysaur	Grass	Poison	405	60	62	63	80	80	60	
2	3	Venusaur	Grass	Poison	525	80	82	83	100	100	80	
3	3	VenusaurMega Venusaur	Grass	Poison	625	80	100	123	122	120	80	
4	4	Charmander	Fire	NaN	309	39	52	43	60	50	65	
...	
795	719	Diancie	Rock	Fairy	600	50	100	150	100	150	50	
796	719	DiancieMega Diancie	Rock	Fairy	700	50	160	110	160	110	110	
797	720	HoopaHoopa Confined	Psychic	Ghost	600	80	110	60	150	130	70	
798	720	HoopaHoopa Unbound	Psychic	Dark	680	80	160	60	170	130	80	
799	721	Volcanion	Fire	Water	600	80	110	120	130	90	70	

800 rows × 13 columns



In [364]:

```
# # df.to_csv('modified.csv')
# df.to_csv('modified.csv', index=False)
```

In [365]:

```
# df.to_excel('modified.xlsx', index=False)
```

In [366]:

```
# df.to_csv('modified.txt', index=False, sep='\t')
```

FILTERING DATA

In [367]:

```
df.loc[df['Type 1'] == 'Grass']
```

Out[367]:

	#	Name	Type 1	Type 2	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Gener
0	1	Bulbasaur	Grass	Poison	318	45	49	49	65	65	45	
1	2	Ivysaur	Grass	Poison	405	60	62	63	80	80	60	
2	3	Venusaur	Grass	Poison	525	80	82	83	100	100	80	
3	3	VenusaurMega Venusaur	Grass	Poison	625	80	100	123	122	120	80	
48	43	Oddish	Grass	Poison	320	45	50	55	75	65	30	
...	
718	650	Chespin	Grass	NaN	313	56	61	65	48	45	38	
719	651	Quilladin	Grass	NaN	405	61	78	95	56	58	57	
720	652	Chesnaught	Grass	Fighting	530	88	107	122	74	75	64	
740	672	Skiddo	Grass	NaN	350	66	65	48	62	57	52	
741	673	Gogoat	Grass	NaN	531	123	100	62	97	81	68	

70 rows × 13 columns



In [368]:

```
df.loc[(df['Type 1'] == 'Grass') & (df['Type 2'] == 'Poison')]
```

Out[368]:

	#	Name	Type 1	Type 2	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Genera
0	1	Bulbasaur	Grass	Poison	318	45	49	49	65	65	45	
1	2	Ivysaur	Grass	Poison	405	60	62	63	80	80	60	
2	3	Venusaur	Grass	Poison	525	80	82	83	100	100	80	
3	3	VenusaurMega Venusaur	Grass	Poison	625	80	100	123	122	120	80	
48	43	Oddish	Grass	Poison	320	45	50	55	75	65	30	
49	44	Gloom	Grass	Poison	395	60	65	70	85	75	40	
50	45	Vileplume	Grass	Poison	490	75	80	85	110	90	50	
75	69	Bellsprout	Grass	Poison	300	50	75	35	70	30	40	
76	70	Weepinbell	Grass	Poison	390	65	90	50	85	45	55	
77	71	Victreebel	Grass	Poison	490	80	105	65	100	70	70	
344	315	Roselia	Grass	Poison	400	50	60	45	100	80	65	
451	406	Budew	Grass	Poison	280	40	30	35	50	70	55	
452	407	Roserade	Grass	Poison	515	60	70	65	125	105	90	
651	590	Foongus	Grass	Poison	294	69	55	45	55	55	15	
652	591	Amoonguss	Grass	Poison	464	114	85	70	85	80	30	



In [369]:

```
df.loc[(df['Type 1'] == 'Grass') | (df['Type 2'] == 'Poison')]
```

Out[369]:

	#	Name	Type 1	Type 2	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Gener
0	1	Bulbasaur	Grass	Poison	318	45	49	49	65	65	45	
1	2	Ivysaur	Grass	Poison	405	60	62	63	80	80	60	
2	3	Venusaur	Grass	Poison	525	80	82	83	100	100	80	
3	3	VenusaurMega Venusaur	Grass	Poison	625	80	100	123	122	120	80	
16	13	Weedle	Bug	Poison	195	40	35	30	20	20	50	
...	
718	650	Chespin	Grass	NaN	313	56	61	65	48	45	38	
719	651	Quilladin	Grass	NaN	405	61	78	95	56	58	57	
720	652	Chesnaught	Grass	Fighting	530	88	107	122	74	75	64	
740	672	Skiddo	Grass	NaN	350	66	65	48	62	57	52	
741	673	Gogoat	Grass	NaN	531	123	100	62	97	81	68	

89 rows × 13 columns

In [370]:

```
df.loc[(df['Type 1'] == 'Grass') & (df['Type 2'] == 'Poison') & (df['HP'] > 70)]
```

Out[370]:

	#	Name	Type 1	Type 2	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Genera
2	3	Venusaur	Grass	Poison	525	80	82	83	100	100	80	
3	3	VenusaurMega Venusaur	Grass	Poison	625	80	100	123	122	120	80	
50	45	Vileplume	Grass	Poison	490	75	80	85	110	90	50	
77	71	Victreebel	Grass	Poison	490	80	105	65	100	70	70	
652	591	Amoonguss	Grass	Poison	464	114	85	70	85	80	30	

In [371]:

```
new_df = df.loc[(df['Type 1'] == 'Grass') & (df['Type 2'] == 'Poison') & (df['HP']
new_df
```

Out[371]:

	#	Name	Type 1	Type 2	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Genera
2	3	Venusaur	Grass	Poison	525	80	82	83	100	100	80	
3	3	VenusaurMega Venusaur	Grass	Poison	625	80	100	123	122	120	80	
50	45	Vileplume	Grass	Poison	490	75	80	85	110	90	50	
77	71	Victreebel	Grass	Poison	490	80	105	65	100	70	70	
652	591	Amoonguss	Grass	Poison	464	114	85	70	85	80	30	

In [372]:

```
new_df.reset_index(drop=True, inplace=True)
```

In [373]:

```
new_df.to_csv('filtered.csv')
```

In [374]:

```
df.loc[df['Name'].str.contains('Mega')]
```

Out[374]:

	#	Name	Type 1	Type 2	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	G
3	3	VenusaurMega Venusaur	Grass	Poison	625	80	100	123	122	120	80	
7	6	CharizardMega Charizard X	Fire	Dragon	634	78	130	111	130	85	100	
8	6	CharizardMega Charizard Y	Fire	Flying	634	78	104	78	159	115	100	
12	9	BlastoiseMega Blastoise	Water	NaN	630	79	103	120	135	115	78	
19	15	BeedrillMega Beedrill	Bug	Poison	495	65	150	40	15	80	145	
23	18	PidgeotMega Pidgeot	Normal	Flying	579	83	80	80	135	80	121	
71	65	AlakazamMega Alakazam	Psychic	NaN	590	55	50	65	175	95	150	
87	80	SlowbroMega Slowbro	Water	Psychic	590	95	75	180	130	80	30	
102	94	GengarMega Gengar	Ghost	Poison	600	60	65	80	170	95	130	
124	115	KangaskhanMega Kangaskhan	Normal	NaN	590	105	125	100	60	100	100	
137	127	PinsirMega Pinsir	Bug	Flying	600	65	155	120	65	90	105	
141	130	GyaradosMega Gyarados	Water	Dark	640	95	155	109	70	130	81	
154	142	AerodactylMega Aerodactyl	Rock	Flying	615	80	135	85	70	95	150	
163	150	MewtwoMega Mewtwo X	Psychic	Fighting	780	106	190	100	154	100	130	
164	150	MewtwoMega Mewtwo Y	Psychic	NaN	780	106	150	70	194	120	140	
168	154	Meganium	Grass	NaN	525	80	82	100	83	100	80	
196	181	AmpharosMega Ampharos	Electric	Dragon	610	90	95	105	165	110	45	
224	208	SteelixMega Steelix	Steel	Ground	610	75	125	230	55	95	30	
229	212	ScizorMega Scizor	Bug	Steel	600	70	150	140	65	100	75	
232	214	HeracrossMega Heracross	Bug	Fighting	600	80	185	115	40	105	75	
248	229	HoundoomMega Houndoom	Dark	Fire	600	75	90	90	140	90	115	
268	248	TyranitarMega Tyranitar	Rock	Dark	700	100	164	150	95	120	71	
275	254	SceptileMega Sceptile	Grass	Dragon	630	70	110	75	145	85	145	

	#	Name	Type 1	Type 2	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	G
279	257	BlazikenMega Blaziken	Fire	Fighting	630	80	160	80	130	80	100	
283	260	SwampertMega Swampert	Water	Ground	635	100	150	110	95	110	70	
306	282	GardevoirMega Gardevoir	Psychic	Fairy	618	68	85	65	165	135	100	
327	302	SableyeMega Sableye	Dark	Ghost	480	50	85	125	85	115	20	
329	303	MawileMega Mawile	Steel	Fairy	480	50	105	125	55	95	50	
333	306	AggronMega Aggron	Steel	NaN	630	70	140	230	60	80	50	
336	308	MedichamMega Medicham	Fighting	Psychic	510	60	100	85	80	85	100	
339	310	ManectricMega Manectric	Electric	NaN	575	70	75	80	135	80	135	
349	319	SharpedoMega Sharpedo	Water	Dark	560	70	140	70	110	65	105	
354	323	CameruptMega Camerupt	Fire	Ground	560	70	120	100	145	105	20	
366	334	AltariaMega Altaria	Dragon	Fairy	590	75	110	110	110	105	80	
387	354	BanetteMega Banette	Ghost	NaN	555	64	165	75	93	83	75	
393	359	AbsolMega Absol	Dark	NaN	565	65	150	60	115	60	115	
397	362	GlalieMega Glalie	Ice	NaN	580	80	120	80	120	80	100	
409	373	SalamenceMega Salamence	Dragon	Flying	700	95	145	130	120	90	120	
413	376	MetagrossMega Metagross	Steel	Psychic	700	80	145	150	105	110	110	
418	380	LatiasMega Latias	Dragon	Psychic	700	80	100	120	140	150	110	
420	381	LatiosMega Latios	Dragon	Psychic	700	80	130	100	160	120	110	
426	384	RayquazaMega Rayquaza	Dragon	Flying	780	105	180	100	180	100	115	
476	428	LopunnyMega Lopunny	Normal	Fighting	580	65	136	94	54	96	135	
494	445	GarchompMega Garchomp	Dragon	Ground	700	108	170	115	120	95	92	
498	448	LucarioMega Lucario	Fighting	Steel	625	70	145	88	140	70	112	
511	460	AbomasnowMega Abomasnow	Grass	Ice	594	90	132	105	132	105	30	
527	475	GalladeMega Gallade	Psychic	Fighting	618	68	165	95	65	115	110	
591	531	AudinoMega Audino	Normal	Fairy	545	103	60	126	80	126	50	

	#	Name	Type 1	Type 2	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation
796	719	DiancieMega Diancie	Rock	Fairy	700	50	160	110	160	110	110	

In [375]:

```
df.loc[~df['Name'].str.contains('Mega')]
```

Out[375]:

	#	Name	Type 1	Type 2	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation
0	1	Bulbasaur	Grass	Poison	318	45	49	49	65	65	45	
1	2	Ivysaur	Grass	Poison	405	60	62	63	80	80	60	
2	3	Venusaur	Grass	Poison	525	80	82	83	100	100	80	
4	4	Charmander	Fire	NaN	309	39	52	43	60	50	65	
5	5	Charmeleon	Fire	NaN	405	58	64	58	80	65	80	
...	
794	718	Zygarde50% Forme	Dragon	Ground	600	108	100	121	81	95	95	
795	719	Diancie	Rock	Fairy	600	50	100	150	100	150	50	
797	720	HoopaHoopa Confined	Psychic	Ghost	600	80	110	60	150	130	70	
798	720	HoopaHoopa Unbound	Psychic	Dark	680	80	160	60	170	130	80	
799	721	Volcanion	Fire	Water	600	80	110	120	130	90	70	

751 rows × 13 columns

In [376]:

```
import re
```

In [377]:

```
df.loc[df['Type 1'].str.contains('Fire|Grass', regex=True)]
```

Out[377]:

	#	Name	Type 1	Type 2	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation
0	1	Bulbasaur	Grass	Poison	318	45	49	49	65	65	45	
1	2	Ivysaur	Grass	Poison	405	60	62	63	80	80	60	
2	3	Venusaur	Grass	Poison	525	80	82	83	100	100	80	
3	3	VenusaurMega Venusaur	Grass	Poison	625	80	100	123	122	120	80	
4	4	Charmander	Fire	NaN	309	39	52	43	60	50	65	
...	
735	667	Litleo	Fire	Normal	369	62	50	58	73	54	72	
736	668	Pyroar	Fire	Normal	507	86	68	72	109	66	106	
740	672	Skiddo	Grass	NaN	350	66	65	48	62	57	52	
741	673	Gogoat	Grass	NaN	531	123	100	62	97	81	68	
799	721	Volcanion	Fire	Water	600	80	110	120	130	90	70	

122 rows × 13 columns



In [378]:

```
df.loc[df['Type 1'].str.contains('fire|grass', flags=re.I, regex=True)]
```

Out[378]:

	#	Name	Type 1	Type 2	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation
0	1	Bulbasaur	Grass	Poison	318	45	49	49	65	65	45	
1	2	Ivysaur	Grass	Poison	405	60	62	63	80	80	60	
2	3	Venusaur	Grass	Poison	525	80	82	83	100	100	80	
3	3	VenusaurMega Venusaur	Grass	Poison	625	80	100	123	122	120	80	
4	4	Charmander	Fire	NaN	309	39	52	43	60	50	65	
...	
735	667	Litleo	Fire	Normal	369	62	50	58	73	54	72	
736	668	Pyroar	Fire	Normal	507	86	68	72	109	66	106	
740	672	Skiddo	Grass	NaN	350	66	65	48	62	57	52	
741	673	Gogoat	Grass	NaN	531	123	100	62	97	81	68	
799	721	Volcanion	Fire	Water	600	80	110	120	130	90	70	

122 rows × 13 columns



In [379]:

```
df.loc[df['Name'].str.contains('pi[a-z]*', flags=re.I, regex=True)]
```

Out[379]:

	#	Name	Type 1	Type 2	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed
13	10	Caterpie	Bug	NaN	195	45	30	35	20	20	45
20	16	Pidgey	Normal	Flying	251	40	45	40	35	35	56
21	17	Pidgeotto	Normal	Flying	349	63	60	55	50	50	71
22	18	Pidgeot	Normal	Flying	479	83	80	75	70	70	101
23	18	PidgeotMega Pidgeot	Normal	Flying	579	83	80	80	135	80	121
30	25	Pikachu	Electric	NaN	320	35	55	40	50	50	90
42	37	Vulpix	Fire	NaN	299	38	41	40	50	65	65
76	70	Weepinbell	Grass	Poison	390	65	90	50	85	45	55
84	78	Rapidash	Fire	NaN	500	65	100	70	80	80	105
136	127	Pinsir	Bug	NaN	500	65	125	100	55	70	85
137	127	PinsirMega Pinsir	Bug	Flying	600	65	155	120	65	90	105
181	167	Spinarak	Bug	Poison	250	40	60	40	40	40	30
186	172	Pichu	Electric	NaN	205	20	40	15	35	35	60
189	175	Togepi	Fairy	NaN	245	35	20	65	40	65	20
202	187	Hoppip	Grass	Flying	250	35	35	40	35	55	50
219	204	Pineco	Bug	NaN	290	50	65	90	35	35	15
239	221	Piloswine	Ice	Ground	450	100	100	80	60	60	50
266	247	Pupitar	Rock	Ground	410	70	84	70	65	70	51
345	316	Gulpin	Poison	NaN	302	70	43	53	43	53	40
357	326	Grumpig	Psychic	NaN	470	80	45	65	90	110	80
358	327	Spinda	Normal	NaN	360	60	60	60	60	60	60
359	328	Trapinch	Ground	NaN	290	45	100	45	45	45	10
390	357	Tropius	Grass	Flying	460	99	68	83	72	87	51
438	393	Piplup	Water	NaN	314	53	51	53	61	56	40
463	416	Vespiquen	Bug	Flying	474	70	80	102	80	102	40
488	440	Happiny	Normal	NaN	220	100	5	5	15	65	30
490	442	Spiritomb	Ghost	Dark	485	50	92	108	92	108	35
501	451	Skorupi	Poison	Bug	330	40	50	90	30	55	65
502	452	Drapion	Poison	Dark	500	70	90	110	60	75	95
557	498	Tepig	Fire	NaN	308	65	63	45	45	45	45
558	499	Pignite	Fire	Fighting	418	90	93	55	70	55	55
578	519	Pidove	Normal	Flying	264	50	55	50	36	30	43
596	536	Palpitoad	Water	Ground	384	75	65	55	65	55	69

	#	Name	Type 1	Type 2	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed
716	648	MeloettaPirouette Forme	Normal	Fighting	600	100	128	90	77	77	128
718	650	Chespin	Grass	NaN	313	56	61	65	48	45	38

In [380]:

```
df.loc[df['Name'].str.contains('^pi[a-z]*', flags=re.I, regex=True)]
```

Out[380]:

	#	Name	Type 1	Type 2	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Genera
20	16	Pidgey	Normal	Flying	251	40	45	40	35	35	56	
21	17	Pidgeotto	Normal	Flying	349	63	60	55	50	50	71	
22	18	Pidgeot	Normal	Flying	479	83	80	75	70	70	101	
23	18	PidgeotMega Pidgeot	Normal	Flying	579	83	80	80	135	80	121	
30	25	Pikachu	Electric	NaN	320	35	55	40	50	50	90	
136	127	Pinsir	Bug	NaN	500	65	125	100	55	70	85	
137	127	PinsirMega Pinsir	Bug	Flying	600	65	155	120	65	90	105	
186	172	Pichu	Electric	NaN	205	20	40	15	35	35	60	
219	204	Pineco	Bug	NaN	290	50	65	90	35	35	15	
239	221	Piloswine	Ice	Ground	450	100	100	80	60	60	50	
438	393	Piplup	Water	NaN	314	53	51	53	61	56	40	
558	499	Pignite	Fire	Fighting	418	90	93	55	70	55	55	
578	519	Pidove	Normal	Flying	264	50	55	50	36	30	43	

Conditional changes

In [381]:

```
df.loc[df['Type 1'] == 'Fire', 'Type 1'] = 'Flamer'
df
```

Out[381]:

	#	Name	Type 1	Type 2	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation	Legend
0	1	Bulbasaur	Grass	Poison	318	45	49	49	65	65	45	1	Fal
1	2	Ivysaur	Grass	Poison	405	60	62	63	80	80	60	1	Fal
2	3	Venusaur	Grass	Poison	525	80	82	83	100	100	80	1	Fal
3	3	VenusaurMega Venusaur	Grass	Poison	625	80	100	123	122	120	80	1	Fal
4	4	Charmander	Flamer	NaN	309	39	52	43	60	50	65	1	Fal
...	
795	719	Diancie	Rock	Fairy	600	50	100	150	100	150	50	6	Tr
796	719	DiancieMega Diancie	Rock	Fairy	700	50	160	110	160	110	110	6	Tr

In [382]:

```
df.loc[df['Type 1'] == 'Flamer', 'Type 1'] = 'Fire'
df
```

Out[382]:

	#	Name	Type 1	Type 2	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Gener
0	1	Bulbasaur	Grass	Poison	318	45	49	49	65	65	45	
1	2	Ivysaur	Grass	Poison	405	60	62	63	80	80	60	
2	3	Venusaur	Grass	Poison	525	80	82	83	100	100	80	
3	3	VenusaurMega Venusaur	Grass	Poison	625	80	100	123	122	120	80	
4	4	Charmander	Fire	NaN	309	39	52	43	60	50	65	
...	
795	719	Diancie	Rock	Fairy	600	50	100	150	100	150	50	
796	719	DiancieMega Diancie	Rock	Fairy	700	50	160	110	160	110	110	
797	720	HoopaHoopa Confined	Psychic	Ghost	600	80	110	60	150	130	70	
798	720	HoopaHoopa Unbound	Psychic	Dark	680	80	160	60	170	130	80	
799	721	Volcanion	Fire	Water	600	80	110	120	130	90	70	

800 rows × 13 columns

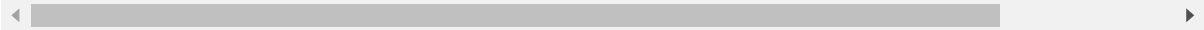
In [383]:

```
df.loc[df['Type 1'] == 'Fire', 'Legendary'] = True
df
```

Out[383]:

	#	Name	Type 1	Type 2	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Gener
0	1	Bulbasaur	Grass	Poison	318	45	49	49	65	65	45	
1	2	Ivysaur	Grass	Poison	405	60	62	63	80	80	60	
2	3	Venusaur	Grass	Poison	525	80	82	83	100	100	80	
3	3	VenusaurMega Venusaur	Grass	Poison	625	80	100	123	122	120	80	
4	4	Charmander	Fire	NaN	309	39	52	43	60	50	65	
...	
795	719	Diancie	Rock	Fairy	600	50	100	150	100	150	50	
796	719	DiancieMega Diancie	Rock	Fairy	700	50	160	110	160	110	110	
797	720	HoopaHoopa Confined	Psychic	Ghost	600	80	110	60	150	130	70	
798	720	HoopaHoopa Unbound	Psychic	Dark	680	80	160	60	170	130	80	
799	721	Volcanion	Fire	Water	600	80	110	120	130	90	70	

800 rows × 13 columns



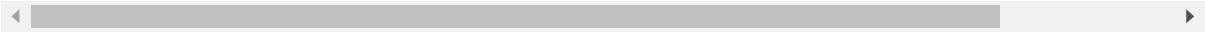
In [384]:

```
df = pd.read_csv('modified.csv')
df
```

Out[384]:

	#	Name	Type 1	Type 2	Legendary	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	SI
0	1	Bulbasaur	Grass	Poison	False	318	45	49	49	65	65	
1	2	Ivysaur	Grass	Poison	False	405	60	62	63	80	80	
2	3	Venusaur	Grass	Poison	False	525	80	82	83	100	100	
3	3	VenusaurMega Venusaur	Grass	Poison	False	625	80	100	123	122	120	
4	4	Charmander	Fire	NaN	False	309	39	52	43	60	50	
...	
795	719	Diancie	Rock	Fairy	True	600	50	100	150	100	150	
796	719	DiancieMega Diancie	Rock	Fairy	True	700	50	160	110	160	110	
797	720	HoopaHoopa Confined	Psychic	Ghost	True	600	80	110	60	150	130	
798	720	HoopaHoopa Unbound	Psychic	Dark	True	680	80	160	60	170	130	
799	721	Volcanion	Fire	Water	True	600	80	110	120	130	90	

800 rows × 13 columns



In [385]:

```
df.loc[df['Total'] > 500, ['Generation', 'Legendary']] = 'TEST VALUE'
df
```

Out[385]:

	#	Name	Type 1	Type 2	Legendary	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Sp. S
0	1	Bulbasaur	Grass	Poison	False	318	45	49	49	65	65	
1	2	Ivysaur	Grass	Poison	False	405	60	62	63	80	80	
2	3	Venusaur	Grass	Poison	TEST VALUE	525	80	82	83	100	100	
3	3	VenusaurMega Venusaur	Grass	Poison	TEST VALUE	625	80	100	123	122	120	
4	4	Charmander	Fire	NaN	False	309	39	52	43	60	50	
...	
795	719	Diancie	Rock	Fairy	TEST VALUE	600	50	100	150	100	150	
796	719	DiancieMega Diancie	Rock	Fairy	TEST VALUE	700	50	160	110	160	110	
797	720	HoopaHoopa Confined	Psychic	Ghost	TEST VALUE	600	80	110	60	150	130	
798	720	HoopaHoopa Unbound	Psychic	Dark	TEST VALUE	680	80	160	60	170	130	
799	721	Volcanion	Fire	Water	TEST VALUE	600	80	110	120	130	90	

800 rows × 13 columns



In [386]:

```
df.loc[df['Total'] > 500, ['Generation', 'Legendary']] = ['Test 1', 'Test 2']
df
```

Out[386]:

	#	Name	Type 1	Type 2	Legendary	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Sp. S
0	1	Bulbasaur	Grass	Poison	False	318	45	49	49	65	65	
1	2	Ivysaur	Grass	Poison	False	405	60	62	63	80	80	
2	3	Venusaur	Grass	Poison	Test 2	525	80	82	83	100	100	
3	3	VenusaurMega Venusaur	Grass	Poison	Test 2	625	80	100	123	122	120	
4	4	Charmander	Fire	NaN	False	309	39	52	43	60	50	
...	
795	719	Diancie	Rock	Fairy	Test 2	600	50	100	150	100	150	
796	719	DiancieMega Diancie	Rock	Fairy	Test 2	700	50	160	110	160	110	
797	720	HoopaHoopa Confined	Psychic	Ghost	Test 2	600	80	110	60	150	130	
798	720	HoopaHoopa Unbound	Psychic	Dark	Test 2	680	80	160	60	170	130	
799	721	Volcanion	Fire	Water	Test 2	600	80	110	120	130	90	

800 rows × 13 columns



In [387]:

```
df = pd.read_csv('modified.csv')
df
```

Out[387]:

	#	Name	Type 1	Type 2	Legendary	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	SI
0	1	Bulbasaur	Grass	Poison	False	318	45	49	49	65	65	
1	2	Ivysaur	Grass	Poison	False	405	60	62	63	80	80	
2	3	Venusaur	Grass	Poison	False	525	80	82	83	100	100	
3	3	VenusaurMega Venusaur	Grass	Poison	False	625	80	100	123	122	120	
4	4	Charmander	Fire	NaN	False	309	39	52	43	60	50	
...	
795	719	Diancie	Rock	Fairy	True	600	50	100	150	100	150	
796	719	DiancieMega Diancie	Rock	Fairy	True	700	50	160	110	160	110	
797	720	HoopaHoopa Confined	Psychic	Ghost	True	600	80	110	60	150	130	
798	720	HoopaHoopa Unbound	Psychic	Dark	True	680	80	160	60	170	130	
799	721	Volcanion	Fire	Water	True	600	80	110	120	130	90	

800 rows × 13 columns



Aggregate Statistics (Group by)

In [388]:

```
df = pd.read_csv('modified.csv')
df.groupby(['Type 1']).mean()
```

Out[388]:

	#	Legendary	Total	HP	Attack	Defense	Sp. Atk	
Type 1								
Bug	334.492754	0.000000	378.927536	56.884058	70.971014	70.724638	53.869565	64.
Dark	461.354839	0.064516	445.741935	66.806452	88.387097	70.225806	74.645161	69.
Dragon	474.375000	0.375000	550.531250	83.312500	112.125000	86.375000	96.843750	88.
Electric	363.500000	0.090909	443.409091	59.795455	69.090909	66.295455	90.022727	73.
Fairy	449.529412	0.058824	413.176471	74.117647	61.529412	65.705882	78.529412	84.
Fighting	363.851852	0.000000	416.444444	69.851852	96.777778	65.925926	53.111111	64.
Fire	327.403846	0.096154	458.076923	69.903846	84.769231	67.769231	88.980769	72.
Flying	677.750000	0.500000	485.000000	70.750000	78.750000	66.250000	94.250000	72.
Ghost	486.500000	0.062500	439.562500	64.437500	73.781250	81.187500	79.343750	76.
Grass	344.871429	0.042857	421.142857	67.271429	73.214286	70.800000	77.500000	70.
Ground	356.281250	0.125000	437.500000	73.781250	95.750000	84.843750	56.468750	62.
Ice	423.541667	0.083333	433.458333	72.000000	72.750000	71.416667	77.541667	76.
Normal	319.173469	0.020408	401.683673	77.275510	73.469388	59.846939	55.816327	63.
Poison	251.785714	0.000000	399.142857	67.250000	74.678571	68.821429	60.428571	64.
Psychic	380.807018	0.245614	475.947368	70.631579	71.456140	67.684211	98.403509	86.
Rock	392.727273	0.090909	453.750000	65.363636	92.863636	100.795455	63.340909	75.
Steel	442.851852	0.148148	487.703704	65.222222	92.703704	126.370370	67.518519	80.
Water	303.089286	0.035714	430.455357	72.062500	74.151786	72.946429	74.812500	70.

In [389]:

```
df.groupby(['Type 1']).mean().sort_values('Defense', ascending=False)
```

Out[389]:

	#	Legendary	Total	HP	Attack	Defense	Sp. Atk	
Type 1								
Steel	442.851852	0.148148	487.703704	65.222222	92.703704	126.370370	67.518519	80.
Rock	392.727273	0.090909	453.750000	65.363636	92.863636	100.795455	63.340909	75.
Dragon	474.375000	0.375000	550.531250	83.312500	112.125000	86.375000	96.843750	88.
Ground	356.281250	0.125000	437.500000	73.781250	95.750000	84.843750	56.468750	62.
Ghost	486.500000	0.062500	439.562500	64.437500	73.781250	81.187500	79.343750	76.
Water	303.089286	0.035714	430.455357	72.062500	74.151786	72.946429	74.812500	70.
Ice	423.541667	0.083333	433.458333	72.000000	72.750000	71.416667	77.541667	76.
Grass	344.871429	0.042857	421.142857	67.271429	73.214286	70.800000	77.500000	70.
Bug	334.492754	0.000000	378.927536	56.884058	70.971014	70.724638	53.869565	64.
Dark	461.354839	0.064516	445.741935	66.806452	88.387097	70.225806	74.645161	69.
Poison	251.785714	0.000000	399.142857	67.250000	74.678571	68.821429	60.428571	64.
Fire	327.403846	0.096154	458.076923	69.903846	84.769231	67.769231	88.980769	72.
Psychic	380.807018	0.245614	475.947368	70.631579	71.456140	67.684211	98.403509	86.
Electric	363.500000	0.090909	443.409091	59.795455	69.090909	66.295455	90.022727	73.
Flying	677.750000	0.500000	485.000000	70.750000	78.750000	66.250000	94.250000	72.
Fighting	363.851852	0.000000	416.444444	69.851852	96.777778	65.925926	53.111111	64.
Fairy	449.529412	0.058824	413.176471	74.117647	61.529412	65.705882	78.529412	84.
Normal	319.173469	0.020408	401.683673	77.275510	73.469388	59.846939	55.816327	63.

In [390]:

```
df.groupby(['Type 1']).mean().sort_values('Attack', ascending=False)
```

Out[390]:

	#	Legendary	Total	HP	Attack	Defense	Sp. Atk	
Type 1								
Dragon	474.375000	0.375000	550.531250	83.312500	112.125000	86.375000	96.843750	88.
Fighting	363.851852	0.000000	416.444444	69.851852	96.777778	65.925926	53.111111	64.
Ground	356.281250	0.125000	437.500000	73.781250	95.750000	84.843750	56.468750	62.
Rock	392.727273	0.090909	453.750000	65.363636	92.863636	100.795455	63.340909	75.
Steel	442.851852	0.148148	487.703704	65.222222	92.703704	126.370370	67.518519	80.
Dark	461.354839	0.064516	445.741935	66.806452	88.387097	70.225806	74.645161	69.
Fire	327.403846	0.096154	458.076923	69.903846	84.769231	67.769231	88.980769	72.
Flying	677.750000	0.500000	485.000000	70.750000	78.750000	66.250000	94.250000	72.
Poison	251.785714	0.000000	399.142857	67.250000	74.678571	68.821429	60.428571	64.
Water	303.089286	0.035714	430.455357	72.062500	74.151786	72.946429	74.812500	70.
Ghost	486.500000	0.062500	439.562500	64.437500	73.781250	81.187500	79.343750	76.
Normal	319.173469	0.020408	401.683673	77.275510	73.469388	59.846939	55.816327	63.
Grass	344.871429	0.042857	421.142857	67.271429	73.214286	70.800000	77.500000	70.
Ice	423.541667	0.083333	433.458333	72.000000	72.750000	71.416667	77.541667	76.
Psychic	380.807018	0.245614	475.947368	70.631579	71.456140	67.684211	98.403509	86.
Bug	334.492754	0.000000	378.927536	56.884058	70.971014	70.724638	53.869565	64.
Electric	363.500000	0.090909	443.409091	59.795455	69.090909	66.295455	90.022727	73.
Fairy	449.529412	0.058824	413.176471	74.117647	61.529412	65.705882	78.529412	84.

In [391]:

```
df.groupby(['Type 1']).mean().sort_values('HP', ascending=False)
```

Out[391]:

	#	Legendary	Total	HP	Attack	Defense	Sp. Atk	
Type 1								
Dragon	474.375000	0.375000	550.531250	83.312500	112.125000	86.375000	96.843750	88.
Normal	319.173469	0.020408	401.683673	77.275510	73.469388	59.846939	55.816327	63.
Fairy	449.529412	0.058824	413.176471	74.117647	61.529412	65.705882	78.529412	84.
Ground	356.281250	0.125000	437.500000	73.781250	95.750000	84.843750	56.468750	62.
Water	303.089286	0.035714	430.455357	72.062500	74.151786	72.946429	74.812500	70.
Ice	423.541667	0.083333	433.458333	72.000000	72.750000	71.416667	77.541667	76.
Flying	677.750000	0.500000	485.000000	70.750000	78.750000	66.250000	94.250000	72.
Psychic	380.807018	0.245614	475.947368	70.631579	71.456140	67.684211	98.403509	86.
Fire	327.403846	0.096154	458.076923	69.903846	84.769231	67.769231	88.980769	72.
Fighting	363.851852	0.000000	416.444444	69.851852	96.777778	65.925926	53.111111	64.
Grass	344.871429	0.042857	421.142857	67.271429	73.214286	70.800000	77.500000	70.
Poison	251.785714	0.000000	399.142857	67.250000	74.678571	68.821429	60.428571	64.
Dark	461.354839	0.064516	445.741935	66.806452	88.387097	70.225806	74.645161	69.
Rock	392.727273	0.090909	453.750000	65.363636	92.863636	100.795455	63.340909	75.
Steel	442.851852	0.148148	487.703704	65.222222	92.703704	126.370370	67.518519	80.
Ghost	486.500000	0.062500	439.562500	64.437500	73.781250	81.187500	79.343750	76.
Electric	363.500000	0.090909	443.409091	59.795455	69.090909	66.295455	90.022727	73.
Bug	334.492754	0.000000	378.927536	56.884058	70.971014	70.724638	53.869565	64.



In [392]:

```
df.groupby(['Type 1']).sum()
```

Out[392]:

	#	Legendary	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation
Type 1										
Bug	23080	0	26146	3925	4897	4880	3717	4471	4256	222
Dark	14302	2	13818	2071	2740	2177	2314	2155	2361	125
Dragon	15180	12	17617	2666	3588	2764	3099	2843	2657	124
Electric	15994	4	19510	2631	3040	2917	3961	3243	3718	144
Fairy	7642	1	7024	1260	1046	1117	1335	1440	826	70
Fighting	9824	0	11244	1886	2613	1780	1434	1747	1784	91
Fire	17025	5	23820	3635	4408	3524	4627	3755	3871	167
Flying	2711	2	1940	283	315	265	377	290	410	22
Ghost	15568	2	14066	2062	2361	2598	2539	2447	2059	134
Grass	24141	3	29480	4709	5125	4956	5425	4930	4335	235
Ground	11401	4	14000	2361	3064	2715	1807	2008	2045	101
Ice	10165	2	10403	1728	1746	1714	1861	1831	1523	85
Normal	31279	2	39365	7573	7200	5865	5470	6245	7012	299
Poison	7050	0	11176	1883	2091	1927	1692	1803	1780	71
Psychic	21706	14	27129	4026	4073	3858	5609	4918	4645	193
Rock	17280	4	19965	2876	4086	4435	2787	3321	2460	152
Steel	11957	4	13168	1761	2503	3412	1823	2177	1492	104
Water	33946	4	48211	8071	8305	8170	8379	7898	7388	320

In [393]:

```
df.groupby(['Type 1']).count()
```

Out[393]:

	#	Name	Type 2	Legendary	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generat
Type 1												
Bug	69	69	52	69	69	69	69	69	69	69	69	
Dark	31	31	21	31	31	31	31	31	31	31	31	
Dragon	32	32	21	32	32	32	32	32	32	32	32	
Electric	44	44	17	44	44	44	44	44	44	44	44	
Fairy	17	17	2	17	17	17	17	17	17	17	17	
Fighting	27	27	7	27	27	27	27	27	27	27	27	
Fire	52	52	24	52	52	52	52	52	52	52	52	
Flying	4	4	2	4	4	4	4	4	4	4	4	
Ghost	32	32	22	32	32	32	32	32	32	32	32	
Grass	70	70	37	70	70	70	70	70	70	70	70	
Ground	32	32	19	32	32	32	32	32	32	32	32	
Ice	24	24	11	24	24	24	24	24	24	24	24	
Normal	98	98	37	98	98	98	98	98	98	98	98	
Poison	28	28	13	28	28	28	28	28	28	28	28	
Psychic	57	57	19	57	57	57	57	57	57	57	57	
Rock	44	44	35	44	44	44	44	44	44	44	44	
Steel	27	27	22	27	27	27	27	27	27	27	27	
Water	112	112	53	112	112	112	112	112	112	112	112	:



In [394]:

```
df['count'] = 1
df.groupby(['Type 1']).count()
df.groupby(['Type 1']).count()['count']
```

Out[394]:

```
Type 1
Bug          69
Dark         31
Dragon       32
Electric     44
Fairy        17
Fighting     27
Fire         52
Flying        4
Ghost        32
Grass        70
Ground       32
Ice          24
Normal       98
Poison       28
Psychic      57
Rock         44
Steel        27
Water       112
Name: count, dtype: int64
```

In [395]:

```
df.groupby(['Type 1', 'Type 2']).count()['count']
```

Out[395]:

```
Type 1  Type 2
Bug      Electric    2
         Fighting    2
         Fire        2
         Flying     14
         Ghost       1
         ..
Water    Ice         3
         Poison      3
         Psychic     5
         Rock        4
         Steel       1
Name: count, Length: 136, dtype: int64
```

Working with large amount of data

In [396]:

```
for df in pd.read_csv('modified.csv', chunksize=5):
    print('CHUNK DF')
    print(df)
```

CHUNK DF

#	Name	Type 1	Type 2	Legendary	Total	HP	At
0	Bulbasaur	Grass	Poison	False	318	45	
1	Ivysaur	Grass	Poison	False	405	60	
2	Venusaur	Grass	Poison	False	525	80	
3	VenusaurMega Venusaur	Grass	Poison	False	625	80	
4	Charmander	Fire	NaN	False	309	39	

	Defense	Sp. Atk	Sp. Def	Speed	Generation
0	49	65	65	45	1
1	63	80	80	60	1
2	83	100	100	80	1
3	123	122	120	80	1
4	42	60	50	65	1

In [397]:

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

for df in pd.read_csv('modified.csv', chunksize=5):
    results = df.groupby('Type 1').count()

    new_df = pd.concat([new_df, results])
```


In [398]:

```
new_df
```

Out[398]:

	#	Name	Type 1	Type 2	Legendary	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	C
Fire	1	1	NaN	0	1	1	1	1	1	1	1	1	
Grass	4	4	NaN	4	4	4	4	4	4	4	4	4	
Fire	4	4	NaN	3	4	4	4	4	4	4	4	4	
Water	1	1	NaN	0	1	1	1	1	1	1	1	1	
Bug	2	2	NaN	0	2	2	2	2	2	2	2	2	
...	
Fairy	1	1	NaN	0	1	1	1	1	1	1	1	1	
Flying	2	2	NaN	2	2	2	2	2	2	2	2	2	
Fire	1	1	NaN	1	1	1	1	1	1	1	1	1	
Psychic	2	2	NaN	2	2	2	2	2	2	2	2	2	
Rock	2	2	NaN	2	2	2	2	2	2	2	2	2	

433 rows × 13 columns