

```
In [1]: import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
from numpy import cov
```

```
In [2]: a=pd.read_csv("2015.csv")
a
```

Out[2]:

	Country	Region	Happiness Rank	Happiness Score	Standard Error	Economy (GDP per Capita)	Family	Health (Life Expectancy)	Freedom
0	Switzerland	Western Europe	1	7.587	0.03411	1.39651	1.34951	0.94143	0.6655
1	Iceland	Western Europe	2	7.561	0.04884	1.30232	1.40223	0.94784	0.6287
2	Denmark	Western Europe	3	7.527	0.03328	1.32548	1.36058	0.87464	0.6493
3	Norway	Western Europe	4	7.522	0.03880	1.45900	1.33095	0.88521	0.6697
4	Canada	North America	5	7.427	0.03553	1.32629	1.32261	0.90563	0.6329
...	...	...	...	...	...	...	...	...	...
153	Rwanda	Sub-Saharan Africa	154	3.465	0.03464	0.22208	0.77370	0.42864	0.5920
154	Benin	Sub-Saharan Africa	155	3.340	0.03656	0.28665	0.35386	0.31910	0.4845
155	Syria	Middle East and Northern Africa	156	3.006	0.05015	0.66320	0.47489	0.72193	0.1568
156	Burundi	Sub-Saharan Africa	157	2.905	0.08658	0.01530	0.41587	0.22396	0.1185
157	Togo	Sub-Saharan Africa	158	2.839	0.06727	0.20868	0.13995	0.28443	0.3645

158 rows × 12 columns



## Head

```
In [3]: a.head(50)
```

Out[3]:

	Country	Region	Happiness Rank	Happiness Score	Standard Error	Economy (GDP per Capita)	Family	Health (Life Expectancy)	Frei
0	Switzerland	Western Europe	1	7.587	0.03411	1.39651	1.34951	0.94143	0.0
1	Iceland	Western Europe	2	7.561	0.04884	1.30232	1.40223	0.94784	0.0
2	Denmark	Western Europe	3	7.527	0.03328	1.32548	1.36058	0.87464	0.0
3	Norway	Western Europe	4	7.522	0.03880	1.45900	1.33095	0.88521	0.0
4	Canada	North America	5	7.427	0.03553	1.32629	1.32261	0.90563	0.0
5	Finland	Western Europe	6	7.406	0.03140	1.29025	1.31826	0.88911	0.0
6	Netherlands	Western Europe	7	7.378	0.02799	1.32944	1.28017	0.89284	0.0
7	Sweden	Western Europe	8	7.364	0.03157	1.33171	1.28907	0.91087	0.0
8	New Zealand	Australia and New Zealand	9	7.286	0.03371	1.25018	1.31967	0.90837	0.0
9	Australia	Australia and New Zealand	10	7.284	0.04083	1.33358	1.30923	0.93156	0.0
10	Israel	Middle East and Northern Africa	11	7.278	0.03470	1.22857	1.22393	0.91387	0.0
11	Costa Rica	Latin America and Caribbean	12	7.226	0.04454	0.95578	1.23788	0.86027	0.0
12	Austria	Western Europe	13	7.200	0.03751	1.33723	1.29704	0.89042	0.0
13	Mexico	Latin America and Caribbean	14	7.187	0.04176	1.02054	0.91451	0.81444	0.0
14	United States	North America	15	7.119	0.03839	1.39451	1.24711	0.86179	0.0
15	Brazil	Latin America and Caribbean	16	6.983	0.04076	0.98124	1.23287	0.69702	0.0
16	Luxembourg	Western Europe	17	6.946	0.03499	1.56391	1.21963	0.91894	0.0
17	Ireland	Western Europe	18	6.940	0.03676	1.33596	1.36948	0.89533	0.0
18	Belgium	Western Europe	19	6.937	0.03595	1.30782	1.28566	0.89667	0.0
19	United Arab Emirates	Middle East and	20	6.901	0.03729	1.42727	1.12575	0.80925	0.0

	Country	Region	Happiness Rank	Happiness Score	Standard Error	Economy (GDP per Capita)	Family	Health (Life Expectancy)	Frei
		Northern Africa							
20	United Kingdom	Western Europe	21	6.867	0.01866	1.26637	1.28548	0.90943	0.1
21	Oman	Middle East and Northern Africa	22	6.853	0.05335	1.36011	1.08182	0.76276	0.1
22	Venezuela	Latin America and Caribbean	23	6.810	0.06476	1.04424	1.25596	0.72052	0.4
23	Singapore	Southeastern Asia	24	6.798	0.03780	1.52186	1.02000	1.02525	0.1
24	Panama	Latin America and Caribbean	25	6.786	0.04910	1.06353	1.19850	0.79661	0.1
25	Germany	Western Europe	26	6.750	0.01848	1.32792	1.29937	0.89186	0.1
26	Chile	Latin America and Caribbean	27	6.670	0.05800	1.10715	1.12447	0.85857	0.4
27	Qatar	Middle East and Northern Africa	28	6.611	0.06257	1.69042	1.07860	0.79733	0.1
28	France	Western Europe	29	6.575	0.03512	1.27778	1.26038	0.94579	0.1
29	Argentina	Latin America and Caribbean	30	6.574	0.04612	1.05351	1.24823	0.78723	0.4
30	Czech Republic	Central and Eastern Europe	31	6.505	0.04168	1.17898	1.20643	0.84483	0.4
31	Uruguay	Latin America and Caribbean	32	6.485	0.04539	1.06166	1.20890	0.81160	0.1
32	Colombia	Latin America and Caribbean	33	6.477	0.05051	0.91861	1.24018	0.69077	0.1
33	Thailand	Southeastern Asia	34	6.455	0.03557	0.96690	1.26504	0.73850	0.1
34	Saudi Arabia	Middle East and Northern Africa	35	6.411	0.04633	1.39541	1.08393	0.72025	0.1
35	Spain	Western Europe	36	6.329	0.03468	1.23011	1.31379	0.95562	0.4

	Country	Region	Happiness Rank	Happiness Score	Standard Error	Economy (GDP per Capita)	Family	Health (Life Expectancy)	Fre
36	Malta	Western Europe	37	6.302	0.04206	1.20740	1.30203	0.88721	0.0
37	Taiwan	Eastern Asia	38	6.298	0.03868	1.29098	1.07617	0.87530	0.0
38	Kuwait	Middle East and Northern Africa	39	6.295	0.04456	1.55422	1.16594	0.72492	0.0
39	Suriname	Latin America and Caribbean	40	6.269	0.09811	0.99534	0.97200	0.60820	0.0
40	Trinidad and Tobago	Latin America and Caribbean	41	6.168	0.10895	1.21183	1.18354	0.61483	0.0
41	El Salvador	Latin America and Caribbean	42	6.130	0.05618	0.76454	1.02507	0.67737	0.0
42	Guatemala	Latin America and Caribbean	43	6.123	0.05224	0.74553	1.04356	0.64425	0.0
43	Uzbekistan	Central and Eastern Europe	44	6.003	0.04361	0.63244	1.34043	0.59772	0.0
44	Slovakia	Central and Eastern Europe	45	5.995	0.04267	1.16891	1.26999	0.78902	0.0
45	Japan	Eastern Asia	46	5.987	0.03581	1.27074	1.25712	0.99111	0.0
46	South Korea	Eastern Asia	47	5.984	0.04098	1.24461	0.95774	0.96538	0.0
47	Ecuador	Latin America and Caribbean	48	5.975	0.04528	0.86402	0.99903	0.79075	0.0
48	Bahrain	Middle East and Northern Africa	49	5.960	0.05412	1.32376	1.21624	0.74716	0.0
49	Italy	Western Europe	50	5.948	0.03914	1.25114	1.19777	0.95446	0.0

Tail

In [4]:

a.tail(50)

Out[4]:

	Country	Region	Happiness Rank	Happiness Score	Standard Error	Economy (GDP per Capita)	Family	Health (Life Expectancy)	Fre
108	Bangladesh	Southern	109	4.694	0.03077	0.39753	0.43106	0.60164	0

	Country	Region	Happiness Rank	Happiness Score	Standard Error	Economy (GDP per Capita)	Family	Health (Life Expectancy)	Fre
		Asia							
109	Iran	Middle East and Northern Africa	110	4.686	0.04449	1.00880	0.54447	0.69805	0
110	Ukraine	Central and Eastern Europe	111	4.681	0.04412	0.79907	1.20278	0.67390	0
111	Iraq	Middle East and Northern Africa	112	4.677	0.05232	0.98549	0.81889	0.60237	0
112	South Africa	Sub-Saharan Africa	113	4.642	0.04585	0.92049	1.18468	0.27688	0
113	Ghana	Sub-Saharan Africa	114	4.633	0.04742	0.54558	0.67954	0.40132	0
114	Zimbabwe	Sub-Saharan Africa	115	4.610	0.04290	0.27100	1.03276	0.33475	0
115	Liberia	Sub-Saharan Africa	116	4.571	0.11068	0.07120	0.78968	0.34201	0
116	India	Southern Asia	117	4.565	0.02043	0.64499	0.38174	0.51529	0
117	Sudan	Sub-Saharan Africa	118	4.550	0.06740	0.52107	1.01404	0.36878	0
118	Haiti	Latin America and Caribbean	119	4.518	0.07331	0.26673	0.74302	0.38847	0
119	Congo (Kinshasa)	Sub-Saharan Africa	120	4.517	0.03680	0.00000	1.00120	0.09806	0
120	Nepal	Southern Asia	121	4.514	0.03607	0.35997	0.86449	0.56874	0
121	Ethiopia	Sub-Saharan Africa	122	4.512	0.03780	0.19073	0.60406	0.44055	0
122	Sierra Leone	Sub-Saharan Africa	123	4.507	0.07068	0.33024	0.95571	0.00000	0
123	Mauritania	Sub-Saharan Africa	124	4.436	0.03947	0.45407	0.86908	0.35874	0
124	Kenya	Sub-Saharan Africa	125	4.419	0.04734	0.36471	0.99876	0.41435	0
125	Djibouti	Sub-Saharan Africa	126	4.369	0.08096	0.44025	0.59207	0.36291	0
126	Armenia	Central and Eastern Europe	127	4.350	0.04763	0.76821	0.77711	0.72990	0
127	Botswana	Sub-Saharan Africa	128	4.332	0.04934	0.99355	1.10464	0.04776	0

	Country	Region	Happiness Rank	Happiness Score	Standard Error	Economy (GDP per Capita)	Family	Health (Life Expectancy)	Fre
128	Myanmar	Southeastern Asia	129	4.307	0.04351	0.27108	0.70905	0.48246	0
129	Georgia	Central and Eastern Europe	130	4.297	0.04221	0.74190	0.38562	0.72926	0
130	Malawi	Sub-Saharan Africa	131	4.292	0.06130	0.01604	0.41134	0.22562	0
131	Sri Lanka	Southern Asia	132	4.271	0.03751	0.83524	1.01905	0.70806	0
132	Cameroon	Sub-Saharan Africa	133	4.252	0.04678	0.42250	0.88767	0.23402	0
133	Bulgaria	Central and Eastern Europe	134	4.218	0.04828	1.01216	1.10614	0.76649	0
134	Egypt	Middle East and Northern Africa	135	4.194	0.03260	0.88180	0.74700	0.61712	0
135	Yemen	Middle East and Northern Africa	136	4.077	0.04367	0.54649	0.68093	0.40064	0
136	Angola	Sub-Saharan Africa	137	4.033	0.04758	0.75778	0.86040	0.16683	0
137	Mali	Sub-Saharan Africa	138	3.995	0.05602	0.26074	1.03526	0.20583	0
138	Congo (Brazzaville)	Sub-Saharan Africa	139	3.989	0.06682	0.67866	0.66290	0.31051	0
139	Comoros	Sub-Saharan Africa	140	3.956	0.04797	0.23906	0.79273	0.36315	0
140	Uganda	Sub-Saharan Africa	141	3.931	0.04317	0.21102	1.13299	0.33861	0
141	Senegal	Sub-Saharan Africa	142	3.904	0.03608	0.36498	0.97619	0.43540	0
142	Gabon	Sub-Saharan Africa	143	3.896	0.04547	1.06024	0.90528	0.43372	0
143	Niger	Sub-Saharan Africa	144	3.845	0.03602	0.06940	0.77265	0.29707	0
144	Cambodia	Southeastern Asia	145	3.819	0.05069	0.46038	0.62736	0.61114	0
145	Tanzania	Sub-Saharan Africa	146	3.781	0.05061	0.28520	1.00268	0.38215	0
146	Madagascar	Sub-Saharan Africa	147	3.681	0.03633	0.20824	0.66801	0.46721	0
147	Central African	Sub-Saharan Africa	148	3.678	0.06112	0.07850	0.00000	0.06699	0

	Country	Region	Happiness Rank	Happiness Score	Standard Error	Economy (GDP per Capita)	Family	Health (Life Expectancy)	Fre
	Republic								
148	Chad	Sub-Saharan Africa	149	3.667	0.03830	0.34193	0.76062	0.15010	0
149	Guinea	Sub-Saharan Africa	150	3.656	0.03590	0.17417	0.46475	0.24009	0
150	Ivory Coast	Sub-Saharan Africa	151	3.655	0.05141	0.46534	0.77115	0.15185	0
151	Burkina Faso	Sub-Saharan Africa	152	3.587	0.04324	0.25812	0.85188	0.27125	0
152	Afghanistan	Southern Asia	153	3.575	0.03084	0.31982	0.30285	0.30335	0
153	Rwanda	Sub-Saharan Africa	154	3.465	0.03464	0.22208	0.77370	0.42864	0
154	Benin	Sub-Saharan Africa	155	3.340	0.03656	0.28665	0.35386	0.31910	0
155	Syria	Middle East and Northern Africa	156	3.006	0.05015	0.66320	0.47489	0.72193	0
156	Burundi	Sub-Saharan Africa	157	2.905	0.08658	0.01530	0.41587	0.22396	0
157	Togo	Sub-Saharan Africa	158	2.839	0.06727	0.20868	0.13995	0.28443	0

Describe

In [5]:

a.describe()

Out[5]:

	Happiness Rank	Happiness Score	Standard Error	Economy (GDP per Capita)	Family	Health (Life Expectancy)	Freedom	(Govern Corrupt
count	158.000000	158.000000	158.000000	158.000000	158.000000	158.000000	158.000000	158.00
mean	79.493671	5.375734	0.047885	0.846137	0.991046	0.630259	0.428615	0.14
std	45.754363	1.145010	0.017146	0.403121	0.272369	0.247078	0.150693	0.12
min	1.000000	2.839000	0.018480	0.000000	0.000000	0.000000	0.000000	0.00
25%	40.250000	4.526000	0.037268	0.545808	0.856823	0.439185	0.328330	0.00
50%	79.500000	5.232500	0.043940	0.910245	1.029510	0.696705	0.435515	0.10
75%	118.750000	6.243750	0.052300	1.158448	1.214405	0.811013	0.549092	0.18
max	158.000000	7.587000	0.136930	1.690420	1.402230	1.025250	0.669730	0.51

## Size

```
In [6]: a.shape
```

1050

## isna

```
In [8]: pd.isna(a)
```

[illegible]

158 rows × 12 columns

# filna

```
In [9]: a.fillna(10)
```



Out[9]:

	Country	Region	Happiness Rank	Happiness Score	Standard Error	Economy (GDP per Capita)	Family	Health (Life Expectancy)	Freedo
0	Switzerland	Western Europe	1	7.587	0.03411	1.39651	1.34951	0.94143	0.6655
1	Iceland	Western Europe	2	7.561	0.04884	1.30232	1.40223	0.94784	0.6287
2	Denmark	Western Europe	3	7.527	0.03328	1.32548	1.36058	0.87464	0.6493
3	Norway	Western Europe	4	7.522	0.03880	1.45900	1.33095	0.88521	0.6697
4	Canada	North America	5	7.427	0.03553	1.32629	1.32261	0.90563	0.6329
...	...	...	...	...	...	...	...	...	...
153	Rwanda	Sub-Saharan Africa	154	3.465	0.03464	0.22208	0.77370	0.42864	0.5920
154	Benin	Sub-Saharan Africa	155	3.340	0.03656	0.28665	0.35386	0.31910	0.4845
155	Syria	Middle East and Northern Africa	156	3.006	0.05015	0.66320	0.47489	0.72193	0.1568
156	Burundi	Sub-Saharan Africa	157	2.905	0.08658	0.01530	0.41587	0.22396	0.1185
157	Togo	Sub-Saharan Africa	158	2.839	0.06727	0.20868	0.13995	0.28443	0.3645

158 rows × 12 columns



# dropna

In [10]:

```
a.dropna()
```

Out[10]:

	Country	Region	Happiness Rank	Happiness Score	Standard Error	Economy (GDP per Capita)	Family	Health (Life Expectancy)	Freedo
0	Switzerland	Western Europe	1	7.587	0.03411	1.39651	1.34951	0.94143	0.6655
1	Iceland	Western Europe	2	7.561	0.04884	1.30232	1.40223	0.94784	0.6287
2	Denmark	Western Europe	3	7.527	0.03328	1.32548	1.36058	0.87464	0.6493
3	Norway	Western Europe	4	7.522	0.03880	1.45900	1.33095	0.88521	0.6697

	Country	Region	Happiness Rank	Happiness Score	Standard Error	Economy (GDP per Capita)	Family	Health (Life Expectancy)	Freedom
4	Canada	North America	5	7.427	0.03553	1.32629	1.32261	0.90563	0.6329
...	...	...	...	...	...	...	...	...	...
153	Rwanda	Sub-Saharan Africa	154	3.465	0.03464	0.22208	0.77370	0.42864	0.5920
154	Benin	Sub-Saharan Africa	155	3.340	0.03656	0.28665	0.35386	0.31910	0.4845
155	Syria	Middle East and Northern Africa	156	3.006	0.05015	0.66320	0.47489	0.72193	0.1568
156	Burundi	Sub-Saharan Africa	157	2.905	0.08658	0.01530	0.41587	0.22396	0.1185
157	Togo	Sub-Saharan Africa	158	2.839	0.06727	0.20868	0.13995	0.28443	0.3645

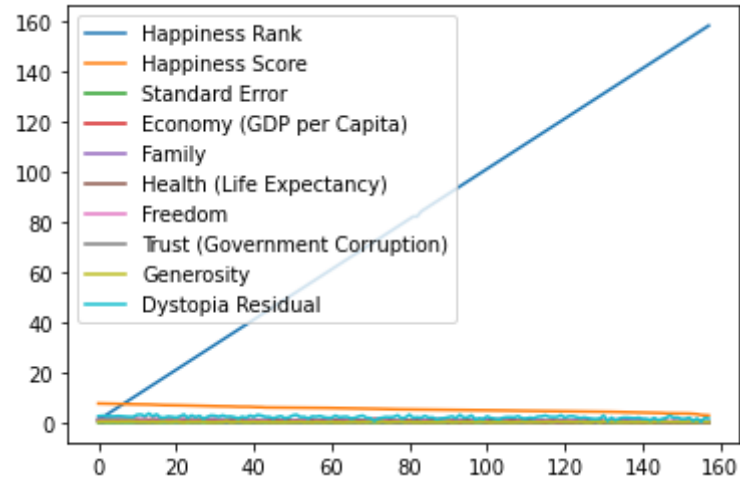
158 rows × 12 columns

# Plots

## Line plot

```
In [11]: a.plot.line()
```

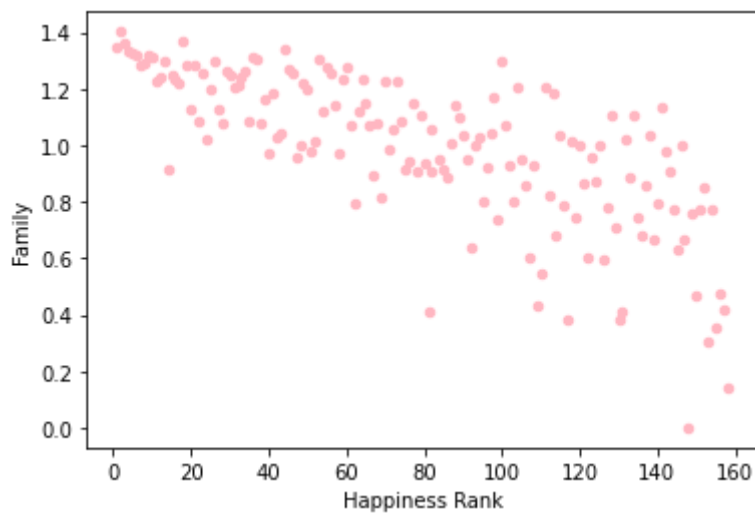
Out[11]: <AxesSubplot:>



## Scatter Plot

```
In [13]: a.plot.scatter(x="Happiness Rank",y="Family",color="lightpink")
```

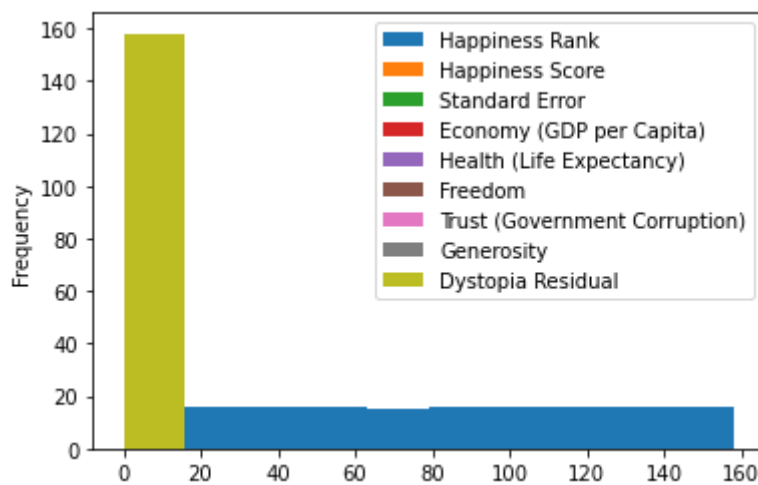
```
Out[13]: <AxesSubplot:xlabel='Happiness Rank', ylabel='Family'>
```



## Histogram

```
In [14]: a.plot.hist(x="Family")
```

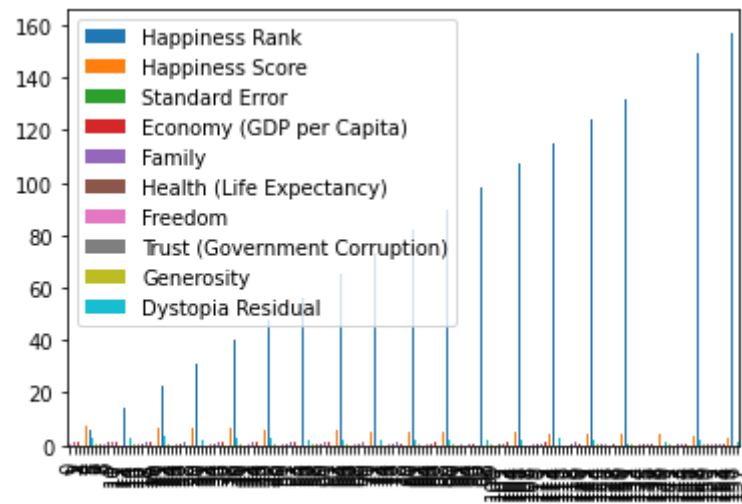
```
Out[14]: <AxesSubplot:ylabel='Frequency'>
```



## Bar Chart

```
In [15]: a.plot.bar()
```

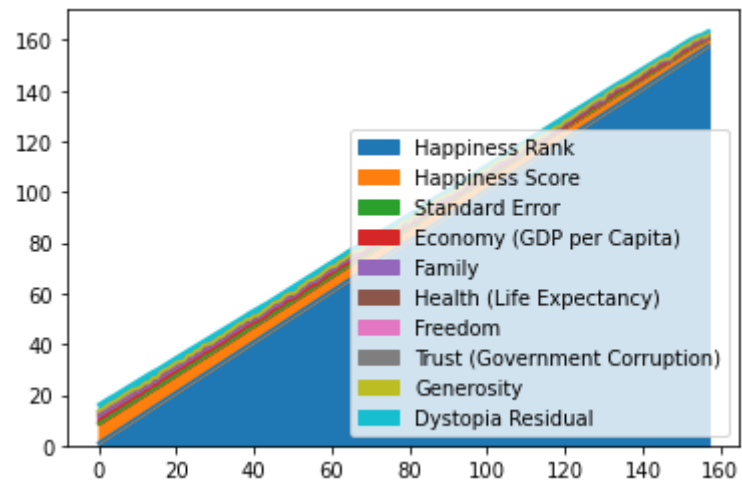
```
Out[15]: <AxesSubplot:>
```



# Area Plot

```
In [16]: a.plot.area()
```

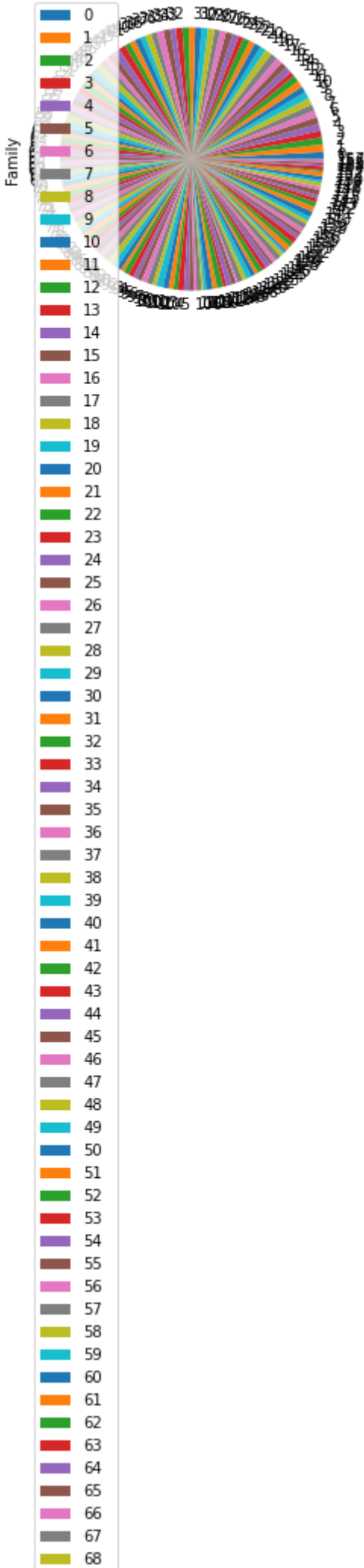
Out[16]: <AxesSubplot:>



# Pie Chart

```
In [19]: a.plot.pie(y="Family")
```

Out[19]: <AxesSubplot:ylabel='Family'>



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```
In [18]: print(a.sum())
```

Country	147	Switzerland	Iceland	Denmark	Norway	Canada	Finland	Ne...
Region	148	Western Europe	Western Europe	Western Europe	Western Europe	Western Europe	Western Europe	Western Europe
Happiness Rank	149							12560
Happiness Score	150							849.366
Standard Error	151							7.56579
Economy (GDP per Capita)	152							133.68968
Family	153							156.58526
Health (Life Expectancy)	154							99.58098
Freedom	155							67.72116
Trust (Government Corruption)	156							22.66065
Generosity	157							37.49269
Dystopia Residual	158							331.63833
dtype:	object							

## Mean

```
In [20]: print(a.mean())
```

Happiness Rank	79.493671
Happiness Score	5.375734
Standard Error	0.047885
Economy (GDP per Capita)	0.846137
Family	0.991046
Health (Life Expectancy)	0.630259
Freedom	0.428615
Trust (Government Corruption)	0.143422
Generosity	0.237296
Dystopia Residual	2.098977
dtype:	float64

## Median

```
In [21]: print(a.median())
```

Happiness Rank	79.500000
Happiness Score	5.232500
Standard Error	0.043940
Economy (GDP per Capita)	0.910245
Family	1.029510
Health (Life Expectancy)	0.696705
Freedom	0.435515
Trust (Government Corruption)	0.107220
Generosity	0.216130
Dystopia Residual	2.095415
dtype:	float64

## Mode

```
In [22]: print(a.mode())
```

	Country	Region	Happiness Rank	Happiness Score \
0	Afghanistan	Sub-Saharan Africa	82.0	5.192
1	Albania	NaN	NaN	NaN

2	Algeria	NaN	NaN	NaN
3	Angola	NaN	NaN	NaN
4	Argentina	NaN	NaN	NaN
..	...	...	...	...
153	Venezuela	NaN	NaN	NaN
154	Vietnam	NaN	NaN	NaN
155	Yemen	NaN	NaN	NaN
156	Zambia	NaN	NaN	NaN
157	Zimbabwe	NaN	NaN	NaN

	Standard Error	Economy (GDP per Capita)	Family \
0	0.03751	0.00000	0.00000
1	0.03780	0.01530	0.13995
2	0.04394	0.01604	0.30285
3	0.04934	0.06940	0.35386
4	0.05051	0.07120	0.38174
..	...	...	...
153	NaN	1.45900	1.34043
154	NaN	1.52186	1.34951
155	NaN	1.55422	1.36058
156	NaN	1.56391	1.36948
157	NaN	1.69042	1.40223

	Health (Life Expectancy)	Freedom	Trust (Government Corruption) \
0	0.92356	0.00000	0.32524
1	NaN	0.07699	NaN
2	NaN	0.09245	NaN
3	NaN	0.10081	NaN
4	NaN	0.10384	NaN
..	...	...	...
153	NaN	0.65821	NaN
154	NaN	0.65980	NaN
155	NaN	0.66246	NaN
156	NaN	0.66557	NaN
157	NaN	0.66973	NaN

	Generosity	Dystopia Residual
0	0.00000	0.32858
1	0.00199	0.65429
2	0.02641	0.67042
3	0.05444	0.67108
4	0.05547	0.89991
..	...	...
153	0.51535	3.10712
154	0.51752	3.17728
155	0.51912	3.19131
156	0.57630	3.26001
157	0.79588	3.60214

[158 rows x 12 columns]

# Standard Deviation

In [23]:

print(a.std())

Happiness Rank	45.754363
Happiness Score	1.145010
Standard Error	0.017146
Economy (GDP per Capita)	0.403121
Family	0.272369
Health (Life Expectancy)	0.247078
Freedom	0.150693
Trust (Government Corruption)	0.120034
Generosity	0.126685
Dystopia Residual	0.553550
dtype: float64	



# Variance

In [24]:

```
print(a.var())
```

```
Happiness Rank      2093.461743
Happiness Score      1.311048
Standard Error       0.000294
Economy (GDP per Capita) 0.162506
Family               0.074185
Health (Life Expectancy) 0.061047
Freedom              0.022708
Trust (Government Corruption) 0.014408
Generosity           0.016049
Dystopia Residual     0.306417
dtype: float64
```

## min and max

In [25]:

```
print(a.min())
```

```
Country      Afghanistan
Region      Australia and New Zealand
Happiness Rank      1
Happiness Score      2.839
Standard Error      0.01848
Economy (GDP per Capita) 0.0
Family           0.0
Health (Life Expectancy) 0.0
Freedom          0.0
Trust (Government Corruption) 0.0
Generosity       0.0
Dystopia Residual 0.32858
dtype: object
```

In [26]:

```
print(a.max())
```

```
Country      Zimbabwe
Region      Western Europe
Happiness Rank      158
Happiness Score      7.587
Standard Error      0.13693
Economy (GDP per Capita) 1.69042
Family           1.40223
Health (Life Expectancy) 1.02525
Freedom          0.66973
Trust (Government Corruption) 0.55191
Generosity       0.79588
Dystopia Residual 3.60214
dtype: object
```

## Correlation and covariance

In [27]:

```
print(a.cov())
```

```
Happiness Rank      Happiness Rank      Happiness Score \
Happiness Rank      2093.461743      -51.975613
Happiness Score      -51.975613      1.311048
Standard Error       0.124358      -0.003480
Economy (GDP per Capita) -14.483883      0.360476
```

Family	-9.142720	0.230969
Health (Life Expectancy)	-8.316021	0.204881
Freedom	-3.839647	0.098042
Trust (Government Corruption)	-2.044785	0.054316
Generosity	-0.928243	0.026156
Dystopia Residual	-13.220847	0.336225

	Standard Error	Economy (GDP per Capita) \
Happiness Rank	0.124358	-14.483883
Happiness Score	-0.003480	0.360476
Standard Error	0.000294	-0.001504
Economy (GDP per Capita)	-0.001504	0.162506
Family	-0.000564	0.070852
Health (Life Expectancy)	-0.001315	0.081323
Freedom	-0.000335	0.022495
Trust (Government Corruption)	-0.000367	0.014898
Generosity	-0.000192	-0.000534
Dystopia Residual	0.000797	0.008939

	Family	Health (Life Expectancy)	Freedom \
Happiness Rank	-9.142720	-8.316021	-3.839647
Happiness Score	0.230969	0.204881	0.098042
Standard Error	-0.000564	-0.001315	-0.000335
Economy (GDP per Capita)	0.070852	0.081323	0.022495
Family	0.074185	0.035741	0.018122
Health (Life Expectancy)	0.035741	0.061047	0.013422
Freedom	0.018122	0.013422	0.022708
Trust (Government Corruption)	0.006722	0.007365	0.008927
Generosity	0.003020	0.003391	0.007138
Dystopia Residual	0.022332	0.002596	0.005237

	Trust (Government Corruption)	Generosity \
Happiness Rank	-2.044785	-0.928243
Happiness Score	0.054316	0.026156
Standard Error	-0.000367	-0.000192
Economy (GDP per Capita)	0.014898	-0.000534
Family	0.006722	0.003020
Health (Life Expectancy)	0.007365	0.003391
Freedom	0.008927	0.007138
Trust (Government Corruption)	0.014408	0.004199
Generosity	0.004199	0.016049
Dystopia Residual	-0.002200	-0.007104

	Dystopia Residual
Happiness Rank	-13.220847
Happiness Score	0.336225
Standard Error	0.000797
Economy (GDP per Capita)	0.008939
Family	0.022332
Health (Life Expectancy)	0.002596
Freedom	0.005237
Trust (Government Corruption)	-0.002200
Generosity	-0.007104
Dystopia Residual	0.306417

## Pearson

In [28]:

```
from scipy.stats import pearsonr
print(pearsonr(a["Family"],a["Standard Error"]))
```

(-0.12072789245713995, 0.13078622720327332)

## Spearman

```
In [29]: from scipy.stats import spearmanr
print(spearmanr(a["Family"],a["Standard Error"]))
```

SpearmanrResult(correlation=-0.21314613912087774, pvalue=0.007168724761077408)

count

```
In [30]: a.count()
```

Out[30]: Country 158
Region 158
Happiness Rank 158
Happiness Score 158
Standard Error 158
Economy (GDP per Capita) 158
Family 158
Health (Life Expectancy) 158
Freedom 158
Trust (Government Corruption) 158
Generosity 158
Dystopia Residual 158
dtype: int64

cumsum

```
In [31]: a.cumsum()
```

Out[31]:

	Country	Region	Happiness Rank	Happiness Score	Standard Error
0	Switzerland	Western Europe	1	7.587	0.034
1	SwitzerlandIceland	Western EuropeWestern Europe	3	15.148	0.082
2	SwitzerlandIcelandDenmark	Western EuropeWestern EuropeWestern Europe	6	22.675	0.116
3	SwitzerlandIcelandDenmarkNorway	Western EuropeWestern EuropeWestern EuropeWestern Europe	10	30.197	0.155
4	SwitzerlandIcelandDenmarkNorwayCanada	Western EuropeWestern EuropeWestern EuropeWestern EuropeWestern Europe	15	37.624	0.190
...	...	...	...	...	...
153	SwitzerlandIcelandDenmarkNorwayCanadaFinlandNe...	Western EuropeWestern EuropeWestern EuropeWestern EuropeWestern EuropeWestern Europe	11934	837.276	7.325

	Country	Region	Happiness Rank	Happiness Score	Standa Err
154	SwitzerlandIcelandDenmarkNorwayCanadaFinlandNe...	Western EuropeWestern EuropeWestern EuropeWest...	12089	840.616	7.361
155	SwitzerlandIcelandDenmarkNorwayCanadaFinlandNe...	Western EuropeWestern EuropeWestern EuropeWest...	12245	843.622	7.411
156	SwitzerlandIcelandDenmarkNorwayCanadaFinlandNe...	Western EuropeWestern EuropeWestern EuropeWest...	12402	846.527	7.498
157	SwitzerlandIcelandDenmarkNorwayCanadaFinlandNe...	Western EuropeWestern EuropeWestern EuropeWest...	12560	849.366	7.565

158 rows × 12 columns

In [ ]: