

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

```
In [3]: path = "C:/Users/Aqueed/Desktop/Data.csv"
symptoms = pd.read_csv(path)
symptoms.head()
```

	name	MDVP:Fo(Hz)	MDVP:Fhi(Hz)	MDVP:Flo(Hz)	MDVP:Jitter(%)	MDVP:Jitter(Abs)	MDVP:RAP	MDVP:PPQ	Jitter:DDP	MDVP:Shimmer
0	phon_R01_S01_1	119.992	157.302	74.997	0.00784	0.00007	0.00370	0.00554	0.01109	0.01109
1	phon_R01_S01_2	122.460	148.650	113.819	0.00968	0.00008	0.00465	0.00696	0.01394	0.01394
2	phon_R01_S01_3	116.682	131.111	111.555	0.01050	0.00009	0.00544	0.00781	0.01633	0.01633
3	phon_R01_S01_4	116.676	137.871	111.366	0.00997	0.00009	0.00502	0.00698	0.01505	0.01505
4	phon_R01_S01_5	116.014	141.781	110.655	0.01284	0.00011	0.00655	0.00908	0.01966	0.01966

5 rows × 24 columns

```
In [6]: symptoms.describe().transpose()
```

	count	mean	std	min	25%	50%	75%	max
MDVP:Fo(Hz)	195.0	154.228641	41.390065	88.333000	117.572000	148.790000	182.769000	260.105000
MDVP:Fhi(Hz)	195.0	197.104918	91.491548	102.145000	134.862500	175.829000	224.205500	592.030000
MDVP:Flo(Hz)	195.0	116.324631	43.521413	65.476000	84.291000	104.315000	140.018500	239.170000
MDVP:Jitter(%)	195.0	0.006220	0.004848	0.001680	0.003460	0.004940	0.007365	0.033160
MDVP:Jitter(Abs)	195.0	0.000044	0.000035	0.000007	0.000020	0.000030	0.000060	0.000260
MDVP:RAP	195.0	0.003306	0.002968	0.000680	0.001660	0.002500	0.003835	0.021440
MDVP:PPQ	195.0	0.003446	0.002759	0.000920	0.001860	0.002690	0.003955	0.019580
Jitter:DDP	195.0	0.009920	0.008903	0.002040	0.004985	0.007490	0.011505	0.064330
MDVP:Shimmer	195.0	0.029709	0.018857	0.009540	0.016505	0.022970	0.037885	0.119080
MDVP:Shimmer(dB)	195.0	0.282251	0.194877	0.085000	0.148500	0.221000	0.350000	1.302000
Shimmer:APQ3	195.0	0.015664	0.010153	0.004550	0.008245	0.012790	0.020265	0.056470
Shimmer:APQ5	195.0	0.017878	0.012024	0.005700	0.009580	0.013470	0.022380	0.079400
MDVP:APQ	195.0	0.024081	0.016947	0.007190	0.013080	0.018260	0.029400	0.137780
Shimmer:DDA	195.0	0.046993	0.030459	0.013640	0.024735	0.038360	0.060795	0.169420
NHR	195.0	0.024847	0.040418	0.000650	0.005925	0.011660	0.025640	0.314820
HNR	195.0	21.885974	4.425764	8.441000	19.198000	22.085000	25.075500	33.047000
status	195.0	0.753846	0.431878	0.000000	1.000000	1.000000	1.000000	1.000000
RPDE	195.0	0.498536	0.103942	0.256570	0.421306	0.495954	0.587562	0.685151
DFA	195.0	0.718099	0.055336	0.574282	0.674758	0.722254	0.761881	0.825288
spread1	195.0	-5.684397	1.090208	-7.964984	-6.450096	-5.720868	-5.046192	-2.434031
spread2	195.0	0.226510	0.083406	0.006274	0.174351	0.218885	0.279234	0.450493
D2	195.0	2.381826	0.382799	1.423287	2.099125	2.361532	2.636456	3.671155
PPE	195.0	0.206552	0.090119	0.044539	0.137451	0.194052	0.252980	0.527367

```
In [7]: symptoms.corr()
```

	MDVP:Fo(Hz)	MDVP:Fhi(Hz)	MDVP:Flo(Hz)	MDVP:Jitter(%)	MDVP:Jitter(Abs)	MDVP:RAP	MDVP:PPQ	Jitter:DDP	MDVP:Shimmer
MDVP:Fo(Hz)	1.000000	0.400985	0.596546	-0.118003	-0.382027	-0.076194	-0.112165	-0.076213	0.097150
MDVP:Fhi(Hz)	0.400985	1.000000	0.084951	0.102086	-0.029198	0.097177	0.091126	0.097150	-0.100488
MDVP:Flo(Hz)	0.596546	0.084951	1.000000	-0.139919	-0.277815	-0.100519	-0.095828	-0.100488	0.990276
MDVP:Jitter(%)	-0.118003	0.102086	-0.139919	1.000000	0.935714	0.990276	0.974256	0.990276	-0.382027
MDVP:Jitter(Abs)	-0.382027	-0.029198	-0.277815	0.935714	1.000000	0.922911	0.897778	0.922913	-0.076194
MDVP:RAP	-0.076194	0.097177	-0.100519	0.990276	0.922911	1.000000	0.957317	1.000000	-0.112165
MDVP:PPQ	-0.112165	0.091126	-0.095828	0.974256	0.897778	0.957317	1.000000	0.957319	-0.076213
Jitter:DDP	-0.076213	0.097150	-0.100488	0.990276	0.922913	1.000000	0.957319	1.000000	-0.098374
MDVP:Shimmer	-0.098374	0.002281	-0.144543	0.769063	0.703322	0.759581	0.797826	0.759555	-0.073742
MDVP:Shimmer(dB)	-0.073742	0.043465	-0.119089	0.804289	0.716601	0.790652	0.839239	0.790621	-0.094717
Shimmer:APQ3	-0.094717	-0.003743	-0.150747	0.746625	0.697153	0.744912	0.763580	0.744894	-0.070682
Shimmer:APQ5	-0.070682	-0.009997	-0.101095	0.725561	0.648961	0.709927	0.786780	0.709907	-0.077774
MDVP:APQ	-0.077774	0.004937	-0.107293	0.758255	0.648793	0.737455	0.804139	0.737439	-0.094732
Shimmer:DDA	-0.094732	-0.003733	-0.150737	0.746635	0.697170	0.744919	0.763592	0.744901	-0.021981
NHR	-0.021981	0.163766	-0.108670	0.906959	0.834972	0.919521	0.844604	0.919548	-0.059144
HNR	0.059144	-0.024893	0.210851	-0.728165	-0.656810	-0.721543	-0.731510	-0.721494	-0.383535
status	-0.383535	-0.166136	-0.380200	0.278220	0.338653	0.266668	0.288698	0.266646	-0.383894
RPDE	-0.383894	-0.112404	-0.400143	0.360673	0.441839	0.342140	0.333274	0.342079	-0.446013
DFA	-0.446013	-0.343097	-0.050406	0.098572	0.175036	0.064083	0.196301	0.064026	-0.413738
spread1	-0.413738	-0.076658	-0.394857	0.693577	0.735779	0.648328	0.716489	0.648328	-0.249450
spread2	-0.249450	-0.002954	-0.243829	0.385123	0.388543	0.324407	0.407605	0.324377	0.177980
D2	0.177980	0.176323	-0.100629	0.433434	0.310694	0.426605	0.412524	0.426556	-0.372356
PPE	-0.372356	-0.069543	-0.340071	0.721543	0.748162	0.670999	0.769647	0.671005	

23 rows × 23 columns

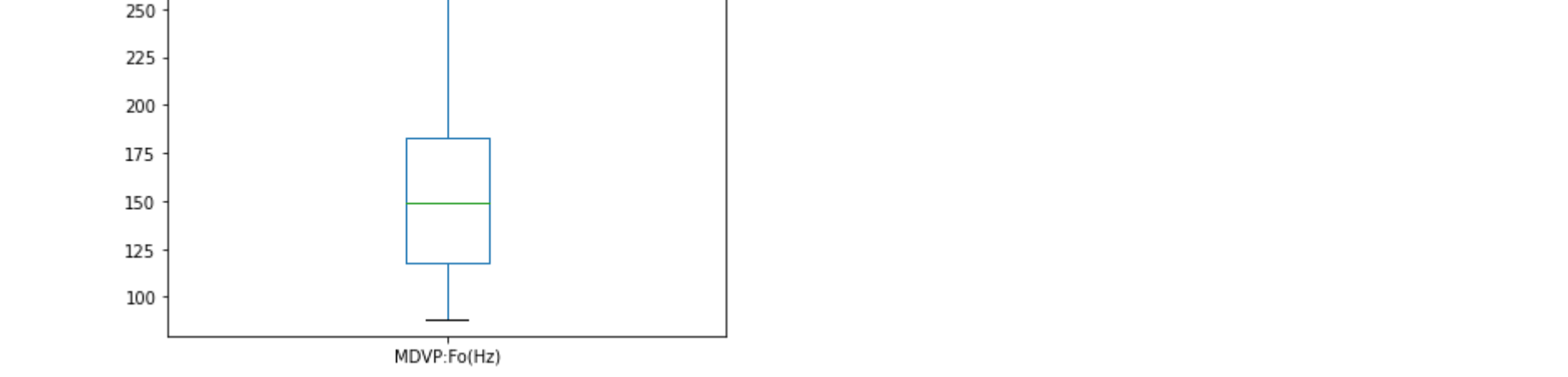
```
In [8]: symptoms.kurtosis(numeric_only = True)
```

MDVP:Fo (Hz)	-0.627898
MDVP:Fhi (Hz)	7.627241
MDVP:Flo (Hz)	0.654615
MDVP:Jitter (%)	12.030939
MDVP:Jitter (Abs)	10.869043
MDVP:RAP	14.213798
MDVP:PPQ	11.963922
Jitter:DDP	14.224762
MDVP:Shimmer	3.238308
MDVP:Shimmer (dB)	5.128193
Shimmer:APQ3	2.720152
Shimmer:APQ5	3.874210
MDVP:APQ	11.163288
Shimmer:DDA	2.720661
NHR	21.994974
HNR	0.616036
status	-0.595518
RPDE	-0.921781
DFA	-0.686152
spread1	-0.050199
spread2	-0.083023
D2	0.220334
PPE	0.528335
dtype:	float64

```
In [9]: symptoms.skew(numeric_only = True)
```

MDVP:Fo (Hz)	0.591737
MDVP:Fhi (Hz)	2.542146
MDVP:Flo (Hz)	1.217350
MDVP:Jitter (%)	3.084946
MDVP:Jitter (Abs)	2.649071
MDVP:RAP	3.360708
MDVP:PPQ	3.073892
Jitter:DDP	3.362058
MDVP:Shimmer	1.666480
MDVP:Shimmer (dB)	1.999389
Shimmer:APQ3	1.580576
Shimmer:APQ5	1.798697
MDVP:APQ	2.618047
Shimmer:DDA	1.580618
NHR	4.220709
HNR	-0.514317
status	-1.187727
RPDE	-0.143402
DFA	-0.033214
spread1	0.432139
spread2	0.144430
D2	0.430384
PPE	0.797491
dtype:	float64

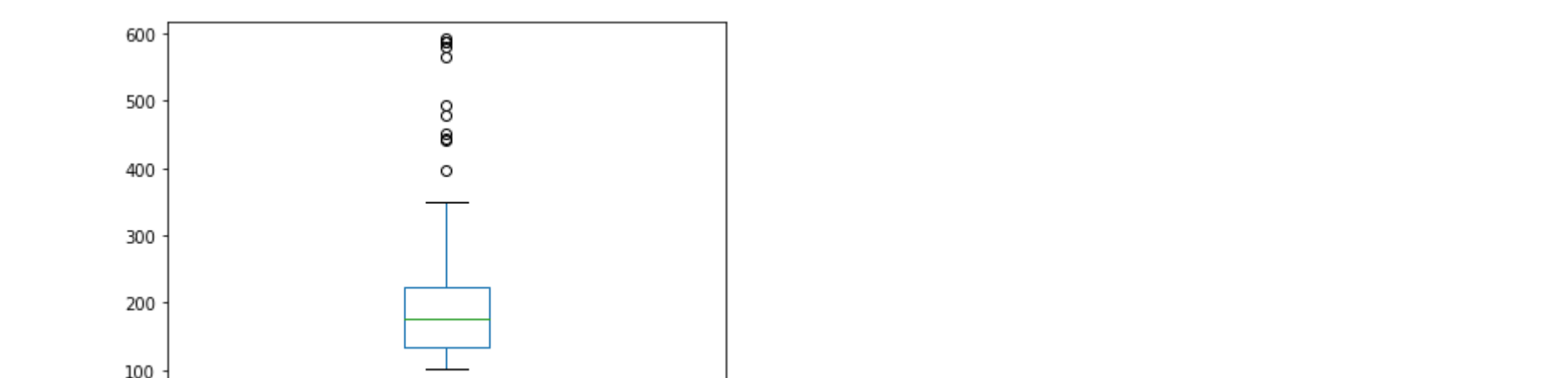
```
In [10]: symptoms['MDVP:Fo (Hz)'].plot(kind='box')
```



```
In [12]: print('Skewness : ',symptoms['MDVP:Fo (Hz)'].skew())
print('Kurtosis : ',symptoms['MDVP:Fo (Hz)'].kurtosis())

Skewness : 0.5917374636540785
Kurtosis : -0.6278981066788805
```

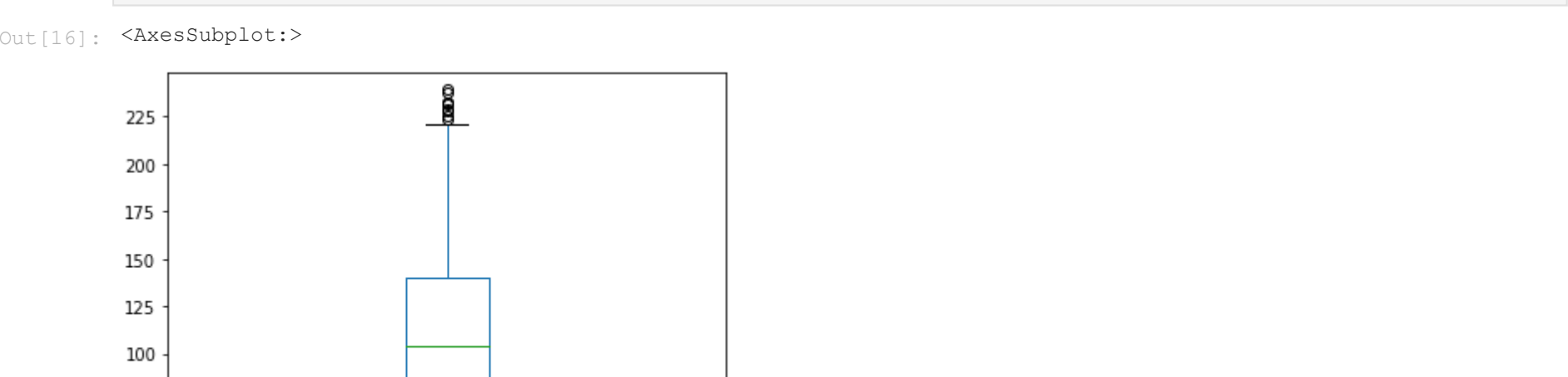
```
In [13]: symptoms['MDVP:Fhi (Hz)'].plot(kind='box')
```



```
In [14]: print('Skewness : ',symptoms['MDVP:Fhi (Hz)'].skew())
print('Kurtosis : ',symptoms['MDVP:Fhi (Hz)'].kurtosis())

Skewness : 2.542145997588399
Kurtosis : 7.627241211631892
```

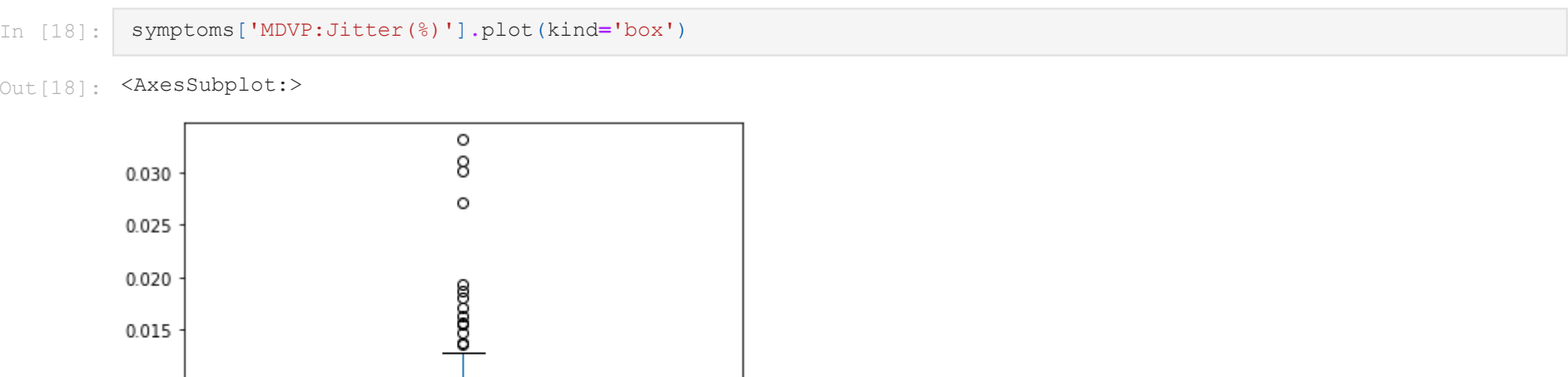
```
In [16]: symptoms['MDVP:Flo (Hz)'].plot(kind='box')
```



```
In [17]: print('Skewness : ',symptoms['MDVP:Flo (Hz)'].skew())
print('Kurtosis : ',symptoms['MDVP:Flo (Hz)'].kurtosis())

Skewness : 1.2173504486278077
Kurtosis : 0.6546145211395391
```

```
In [18]: symptoms['MDVP:Jitter (%)'].plot(kind='box')
```



```
In [19]: print('Skewness : ',symptoms['MDVP:Jitter(%)'].skew())
print('Kurtosis : ',symptoms['MDVP:Jitter(%)'].kurtosis())

Skewness : 3.0849462014441817
Kurtosis : 12.030939276179508
```

```
In [21]: symptoms['MDVP:Jitter (Abs)'].plot(kind='box')
```



```
In [22]: print('Skewness : ',symptoms['MDVP:Jitter (Abs)'].skew())
print('kurtosis : ',symptoms['MDVP:Jitter (Abs)'].kurtosis())

Skewness : 2.6490714165257274
kurtosis : 10.869042517763667
```

```
In [24]: symptoms['MDVP:RAP'].plot(kind='box')
```



```
In [25]: print('Skewness : ',symptoms['MDVP:RAP'].skew())
print('Kurtosis : ',symptoms['MDVP:RAP'].kurtosis())

Skewness : 3.3607084504805536
Kurtosis : 14.21379721522422
```

```
In [26]: symptoms['MDVP:PPQ'].plot(kind='box')
```



```
In [27]: print('Skewness : ',symptoms['MDVP:PPQ'].skew())
print('Kurtosis : ',symptoms['MDVP:PPQ'].kurtosis())

Skewness : 3.073892457888517
Kurtosis : 11.963922120220282
```

```
In [ ]:
```