Economics 257

September 22, 2025 **R. Davidson**

Assignment 1

Here is the first table of numbers in Chapter 1 of the textbook.

7.94	1.88	7.35	0.74	0.79	6.63	3.15	9.50	3.91	2.26
0.91	1.31	0.85	3.37	4.20	1.77	0.22	0.91	1.00	2.10
1.05	2.23	0.99	0.53	10.26	5.42	3.22	2.91	1.83	0.56
2.70	0.65	0.43	2.78	1.55	2.29	3.08	2.03	0.53	4.63
7.15	2.45	4.28	2.75	0.20	2.32	0.72	2.30	2.29	1.85
0.88	3.09	0.94	1.61	0.99	2.21	2.22	1.37	1.89	1.03
0.75	1.95	3.92	1.09	3.14	1.80	0.80	6.46	2.56	2.27
5.52	4.39	7.26	9.88	0.24	0.15	1.41	2.46	1.44	0.96
3.28	0.63	1.32	0.75	1.63	1.27	7.45	0.52	5.81	5.09
0.51	3.26	6.05	0.85	4.19	2.66	0.27	1.25	5.79	4.10
0.39	0.70	1.29	0.87	2.26	6.76	1.63	1.19	3.33	3.34
0.92	7.00	0.40	1.61	0.58	1.39	7.33	3.45	0.27	3.08
3.41	1.06	2.41	1.72	6.16	4.82	0.20	1.23	0.62	3.64
0.31	1.98	1.46	5.30	1.04	0.37	3.30	6.57	8.36	0.76
1.73	0.58	2.43	0.54	4.35	1.66	0.79	5.49	1.17	1.10
4.36	0.91	0.68	0.75	0.48	3.79	0.29	0.57	6.38	2.10
0.96	2.84	4.22	1.29	2.26	10.68	0.46	1.79	1.95	0.49
5.10	1.70	1.15	2.40	1.22	5.10	4.34	3.21	0.62	1.30
0.93	6.08	4.10	0.09	5.74	2.43	3.69	1.95	0.95	1.98
4.52	1.62	2.20	3.53	1.17	0.44	0.77	4.65	0.65	4.02

You are asked to compute, for this table of 200 numbers, the various descriptive statistics presented in Chapter 3:

D3.0 The sample mean

$$\bar{X} = \frac{1}{N}\sum_{i=1}^{N} x_i.$$

Note that here $N = 200$.

D3.1 A set of trimmed means:

$$\bar{X}_{[k,k]} = \frac{1}{N-2k}\sum_{i=k+1}^{N-k} x_{(i)},$$

for $k = 1, 5, 10, 20$. Recall that the notation $x_{(i)}$ refers to the i^{th} *order statistic.*

D3.2 The sample median, with this definition:

$$\hat{q}_{0.5} = \begin{cases} x_{(j)} & j = (N+1)/2, \text{ if } N \text{ is odd;} \\ \dfrac{x_{(j)} + x_{(j+1)}}{2} & j = N/2, \text{ if } N \text{ is even.} \end{cases}$$

D3.3 Some quantiles, with the following definition:

$$\hat{q}_\alpha = \min_j x_{(j)} \text{ such that } j/N \geq \alpha.$$

Obtain the median ($\alpha = 0.5$), and the quintiles.

D3.4 The sample variance

$$s^2 = (N-1)^{-1} \sum_{i=1}^{N} (x_i - \bar{X})^2.$$

Would your answer be different if we had $x_{(i)}$ instead of x_i in the above formula?

D3.5 The standard error:

$$s = +\left[(N-1)^{-1} \sum_{i=1}^{N} (x_i - \bar{X})^2\right]^{1/2}.$$

D3.6 The range: $x_{(N)} - x_{(1)}$.

D3.7 The interquartile range: $\hat{q}_{0.75} - \hat{q}_{0.25}$.

D3.8 The coefficient of skewness:

$$\frac{(N-1)^{-1} \sum_{i=1}^{N} (x_i - \bar{X})^3}{s^3}.$$

D3.9 The alternative skewness measure: $(\bar{X} - \hat{q}_{0.5})/s$.
Are the results of this and the preceding computation directly comparable? If so, why; if not, why not?

D3.10 The coefficient of kurtosis:

$$\frac{(N-1)^{-1} \sum_{i=1}^{N} (x_i - \bar{X})^4}{s^4} - 3.$$

Are the results for skewness and kurtosis compatible with the idea that these numbers were drawn from a normal distribution?