

Answers for Homework 1 - STAT451

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1 Exercise 64:

Python source code: [ex64.py](#)

Viscosity	Wear					
20.4	58.8	30.8	27.3	29.9	17.7	76.5
30.2	44.5	47.1	48.7	41.6	32.8	18.3
89.4	73.3	57.1	66.0	93.8	133.2	81.1
252.6	30.6	24.2	16.6	38.9	28.7	23.6

Results:

Viscosity	Mean (\bar{x})	Standard Deviation (s)	Coefficient of Variation ($100s/\bar{x}$)
20.4	40.167	22.497	56.011
30.2	38.833	11.519	29.663
89.4	84.083	27.156	32.296
252.6	27.100	7.549	27.857

2 Exercise 65:

Python file: [ex65.py](#)

Class	81 - <83	83 - <85	85 - <87	87 - <89	89 - <91
Frequency	6	7	17	30	43
Class	91 - <93	93 - <95	95 - <97	97 - <99	
Frequency	28	22	13	3	

2.1 a) Construct a histogram based on relative frequencies.

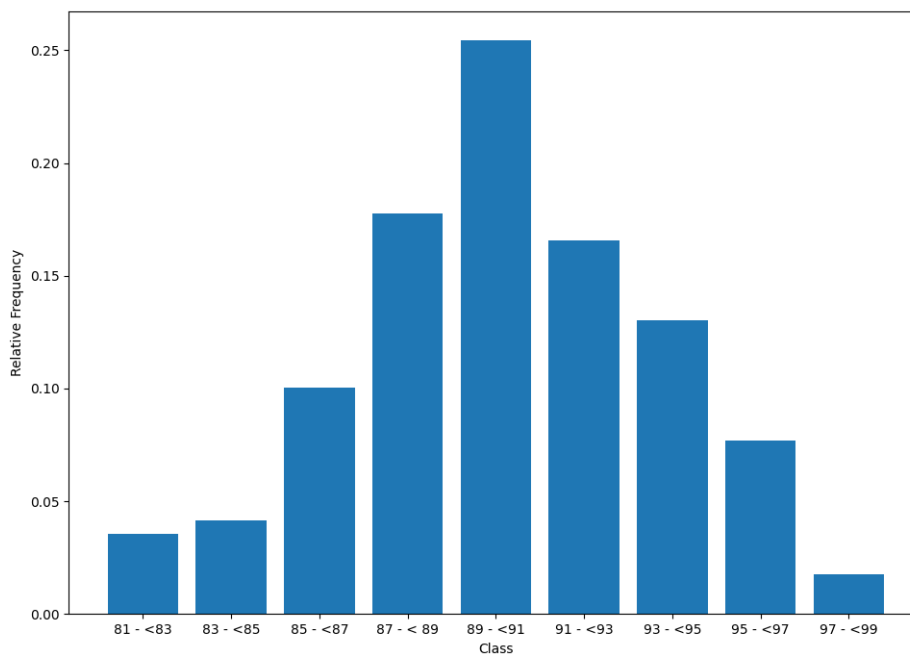


Figure 1: Histogram based on relative frequencies

Sum of frequencies: 169

2.2 b) What proportion of the strength observations are at least 85? Less than 95?

- At least 85%:
 - Total frequency: $17 + 30 + 43 + 28 + 22 + 13 + 3 = 156$
 - Proportion: $\frac{156}{169} = 0.9237$
- Less than 95%:
 - Total frequency: $6 + 7 + 17 + 30 + 43 + 28 + 22 =$
 - Proportion: $\frac{153}{169} = 0.9053$

2.3 c) Roughly what proportion of the observations are less than 90?

- Total frequency: $6 + 7 + 17 + 30 = 60$
- Proportion: $\frac{60}{169} = 0.3550$

3 Exercise 67:

M:	3.7	3.4	3.7	4.0	3.9	3.8	3.4	3.6	3.1	4.0	3.4	3.8	3.5
F:	3.8	2.6	3.2	3.0	4.3	3.5	3.1	3.1	3.2	3.0			

3.1 a) Compare and contrast the diameter observations for the two genders.

- No massive difference between the two genders, no outliers.

3.2 b) Calculate a 10% trimmed mean for each of the two samples, and compare to other measures of center.

- Mean of M: 3.6384615384615384
- Mean of F: 3.2800000000000002
- Median of M: 3.7
- Median of F: 3.1500000000000004
- Trimmed mean of M:
 - Sort the items:
- Trimmed mean of F: 3.2370