Statistics

Homework 1 – Representation of Data

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1. (a) For the following data set,

$$1, 8, 1, 5, 8, 6, 3, 3, 3, 7$$

the mid-range, average, median and mode are as follows.

$$\begin{aligned}
\text{Mid-range} &= \frac{1+8}{2} = 4.5 \\
\text{Average} &= \frac{1+8+1+5+8+6+3+3+3+7}{10} = 4.5 \\
\text{Median} &= \frac{3+5}{2} = 4 \\
\text{Mode} &= 3
\end{aligned}$$

(b) For the following data set,

$$14, 18, 30, 31, 15, 18, 27$$

the mid-range, average, median and mode are as follows.

$$\begin{aligned}
\text{Mid-range} &= \frac{14+31}{2} = 22.5 \\
\text{Average} &= \frac{14+18+30+31+15+18+27}{7} \approx 21.86 \\
\text{Median} &= 18 \\
\text{Mode} &= 18
\end{aligned}$$

3. In the month of August 2010 it was very hot. The Israeli meteorological service recorded the maximum temperature. The results are presented in Table 1.

Number of days	Max. temperature (°C)
2	27-29
6	30-32
12	33-35
5	36-38
4	39-41

Table 1: Maximum daily temperature frequencies for August 2010

Max. temp. (°C)	Frequency	Relative frq.	Cumulative frq.	relative cumulative frq.
27-29	2	0.0690	2	0.0690
30-32	6	0.2069	8	0.2759
33-35	12	0.4138	20	0.6897
36-38	5	0.1724	25	0.8621
39-41	4	0.1379	29	1.0000

Table 2: Many types of frequencies of the data in Table 1

(a) Table 2 shows the frequency, relative frequency, cumulative frequency, and relative cumulative frequency.

(b) Figure 1 shows a bar graph of the data in Table 1 as well as a histogram.

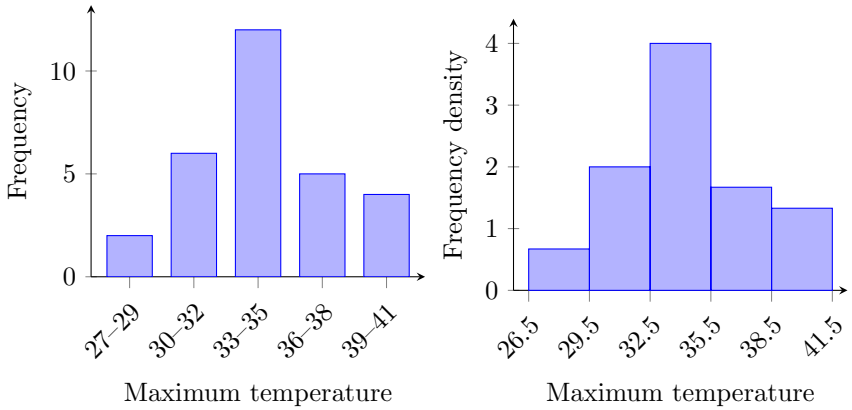

Figure 1: Bar graph of the data in Table 1 (left) and a histogram of the same (right)

(c) The mid-range, average, median and mode for this data are as follows.

$$\text{Mid-range} = \frac{28+40}{2} = 34$$

$$\text{Average} = \frac{2\times 28 + 6\times 31 + 12\times 34 + 5\times 37 + 4\times 40}{29} \approx 34.3103$$

$$\text{Median} = \frac{3\left(\frac{29}{2} - 8\right)}{12} + 32.5 = 34.125$$

$$\text{Modal class} = [32.5, 35.5)$$

6.