

- 1.) Solve problem 16 from [Ross, p.48]. Write a MatLab script that can be used to calculate all requested values and to plot the cumulative relative frequency plot.
- 2.) Solve problem 17 (b)-(e) from [Ross, p.48]. Write a MatLab script that can be used to calculate all requested values and to plot the requested histogram. Furthermore, provide a box plot for the given data set and calculate the 10th percentile and the 90th percentile.

- 3.) Let (x_1, x_2, \dots, x_N) be a data set and:

$$\bar{x}_j = \frac{\sum_{i=1}^j x_i}{j} \quad (j = 1, \dots, N) \quad \text{and} \quad s_1^2 = 0, \quad s_j^2 = \frac{\sum_{i=1}^j (x_i - \bar{x}_j)^2}{j-1} \quad (j = 2, \dots, N)$$

Then, for $j = 1, \dots, N-1$:

$$\bar{x}_{j+1} = \bar{x}_j + \frac{x_{j+1} - \bar{x}_j}{j+1} \quad \text{and} \quad s_{j+1}^2 = \left(1 - \frac{1}{j}\right) s_j^2 + (j+1)(\bar{x}_{j+1} - \bar{x}_j)^2$$

- 4.) Solve problem 26 (b)-(e) from [Ross, p.52].
- 5.) Let x_1, \dots, x_{100} be a set of 100 sampled data values with sample mean $\bar{x} = 101.2$ and sample variance $s^2 = 7.29$.
 - (i) Determine the minimal number n_{min} of samples that belong to the interval
$$I = (\bar{x} - 5, \bar{x} + 5) = (96.2, 106.2)$$
 - (ii) Give a concrete example of data values for x_1, \dots, x_{100} , such that $\bar{x} = 101.2$, $s^2 = 7.29$ and exactly n_{min} of the x_i 's belong to I .
- 6.) Solve problem 33 from [Ross, p.53]. Also calculate and draw the line that fits the given pairs of data best.