Statistics and Probability
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Exercise Set 1: One-Dimensional Statistical Series

Statistics and Probability — Basics 00

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Exercise 1

The triglyceride level (in g/L) was measured in 250 men aged 20–30 years:

Triglycerides (g/L)	[0.4, 0.6[	[0.6, 0.8[	[0.8, 1.0[	[1.0, 1.2[	[1.2, 1.4[	[1.4, 1.6[
Number of men	5	32	86	89	32	6

1. Calculate the relative frequencies and the cumulative ascending frequencies.
2. Draw the histogram and its frequency polygon.
3. Determine the modal class graphically and by calculation.
4. Plot the cumulative frequency curves (ascending and descending) on the same graph. Determine the median graphically, calculate it, and interpret the value.

Exercise 2

The mass (in grams) of eggs from a farm was recorded:

Egg mass (g)	[20, 30[	[30, 40[	[40, 50[	[50, 60[	[60, 70[	[70, 80[	[80, 90[
Number of eggs	3	51	74	112	92	62	6

1. Define the population, the variable, its nature, and its modalities.
2. Complete the table with class centers, cumulative frequencies (ascending and descending), and relative cumulative frequencies (ascending and descending).
3. Draw the histogram of frequencies.
4. Estimate the number of eggs weighing between 45 g and 63 g. Indicate this on the histogram.
5. Determine the modal class and the median class. Calculate the mean mass. Interpret these values.
6. Regroup the classes into the following intervals: [20, 40[, [40, 50[, [50, 60[, [60, 70[, [70, 90[. Draw the new frequency histogram.

Exercise 3

The distribution of daily wages (in 10^2 DA) for a group of employees is given below. However, one frequency is missing.

Salary class (10^2 DA)	[5, 6[	[6, 7[	[7, 8[	[8, 9[	[9, 10[
Number of employees	60	80	?	120	50

1. What is the variable and its nature?
2. Knowing that the modal class is [7, 8[and the calculated mode is 761.1 DA, determine the missing frequency. *(Hint: Use the mode formula for grouped data).*

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3. Draw the frequency histogram. Verify the mode graphically.
4. Draw the polygon of cumulative ascending frequencies (ogive).
5. Calculate the mean salary. Is the distribution symmetrical? Justify your answer. Compute the variance and standard deviation.
6. Estimate the number of employees with salaries between 640 DA and 850 DA.
7. If each employee receives a flat raise of 100 DA plus a 5% bonus on their initial salary, what are the new mean and standard deviation?