

**Last Name:**

**First Name:**

**SCIPER:**

**Practice Problems: Exercise 1 – Microengineering 110**

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**Prof. Vivek Subramanian**

1. The following table provides the weekly salary scale determined for a group of workers.

<b>Weekly Salary (CHF)</b>	<b>Number of workers</b>
<300	0
300-400	200
400-500	300
500-600	150
600-700	250

Assume that the upper limit for each interval falls within the lower interval (e.g., 400 falls within the range 300-400, not within the range 400-500).

- a. Generate a histogram for the above data. You may draw it by hand, code it in Python, or use a convenient software package such as Excel, etc.

b. Generate a pie chart for the same dataset.

c. Generate a cumulative distribution plot for the same dataset.

d. What is the total number of workers who have a weekly salary  $\leq 500$  CHF

2. The following table shows the results of a test for a group of students.

Score Range	Frequency
0-<40	0
40-<50	3
50-<60	5
60-<70	8
70-<80	6
80-<90	2
90-100	1

- a. Calculate the mean score of the students. For each range, you can assume that the students within each range average to the midpoint of that range.

- b. What class (i.e., range of scores, for example, 40-<50) contains the median?

- c. What class contains the mode?

- d. Often, if we want to calculate an exact median in a histogram where we only have intervals of classes, such as the data above, we often use the following formula:

$$Median = L + \frac{\frac{N}{2} - CF}{f} \cdot h$$

Where:

L is the lower bound of the class within which the median exists

CF is the cumulative frequency of the class below the median class

f is the frequency of the median class

h is the median class width.

Calculate the exact median.