Last Name:

First Name:

SCIPER:

Practice Problems: Exercise 1 – Microengineering 110

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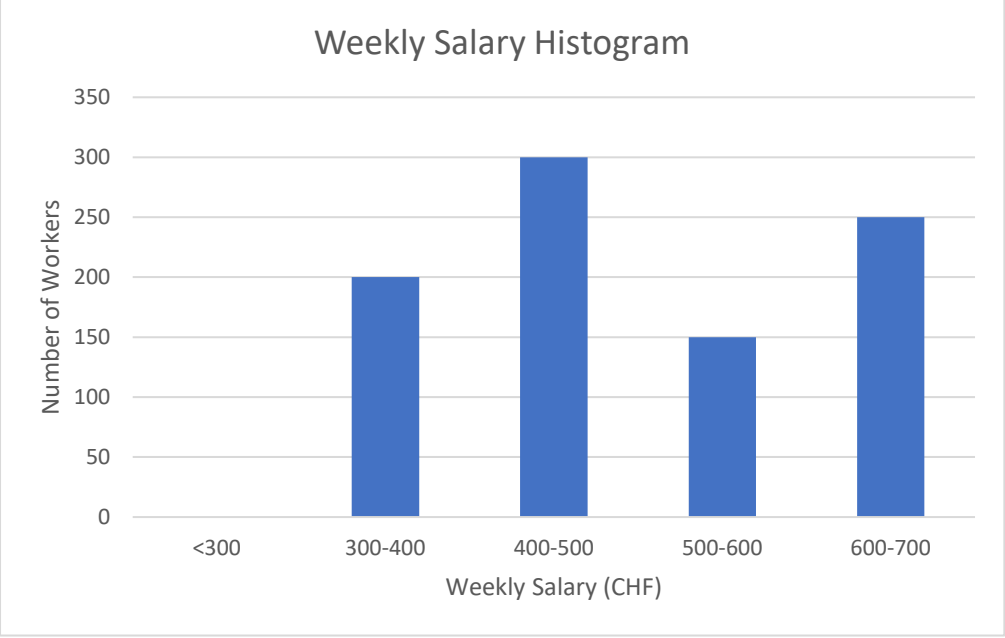
1. The following table provides the weekly salary scale determined for a group of workers.

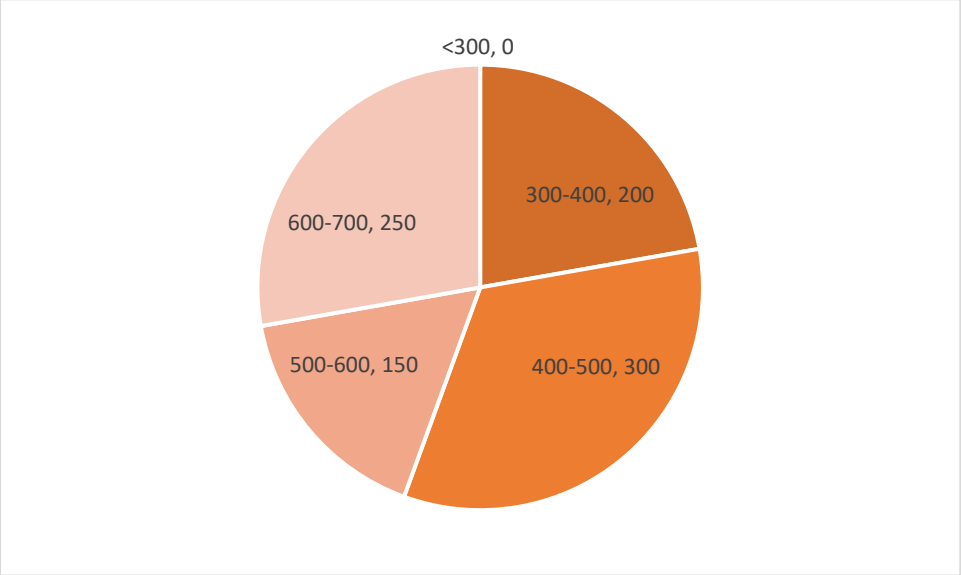
Weekly Salary (CHF)	Number of workers
<300	0
300-400	200
400-500	300
500-600	150
600-700	250

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).

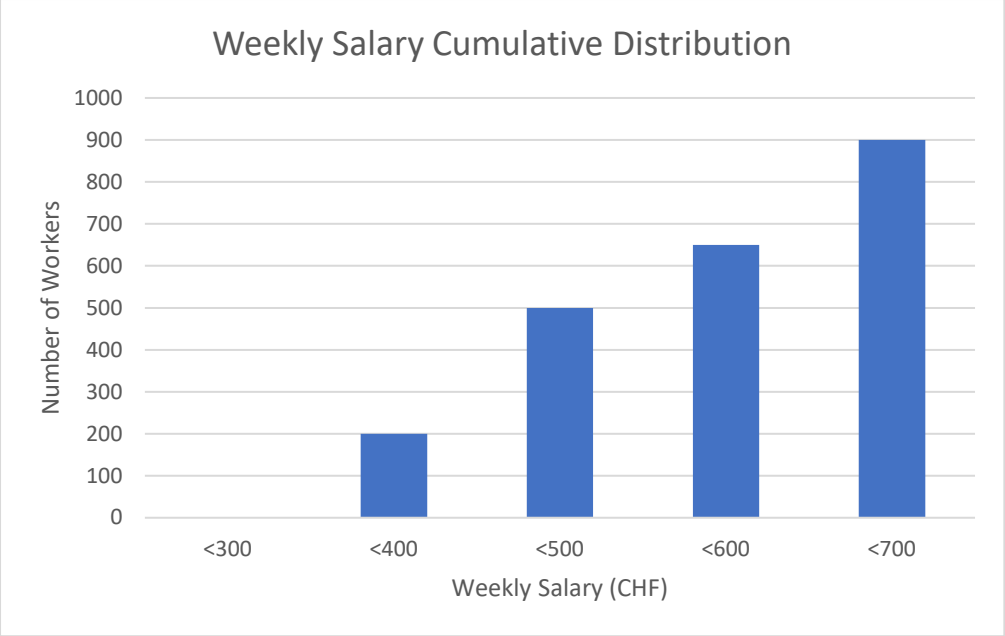
a. Generate a histogram for the above data. You may draw it by hand, code it in Python, or use a convenient software package such as Excel, etc.



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 <=500 CHF

500

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.

Score Range	Midpoint (x)	frequency (f)	f · x
0-40	20	0	0
41-50	45	3	135
51-60	55	5	275
61-70	65	8	520
71-80	75	6	450
81-90	85	2	170
91-100	95	1	95
TOTAL			1645
Number of students		25	
Mean			65.8

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

60-<70

c. What class contains the mode?

60-<70

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.

N = 25
L = 61
CF = 8
f = 8
h = 10

Median = 61 + ((25/2)-8)/8*9 = 65.625