1.1 Task 1: Beverage producer

A small medium-sized, regional beverage producer produces lemonade in three different flavors. As the producer's technical manager, you have set yourself the goal of further optimizing processes and procedures. In a first step, the basis for this is to improve the demand forecast. Based on past values, future demand should be forecasted as accurately as possible. Given the actual requirements of the first three quarters of this year, you want to determine the demand for the first two quarters of next year:

Variety /Quarter	I/2018	II/2018	III/2018
Lemon	28.100	34.200	31.300
Elderberry	10.400	11.000	9.000
Lychee	8.000	10.200	12.000

Task A: First, consider and discuss whether one of the possible forecasting methods is generally superior. Determine the prognosis values for the different types of lemonade. Use the simple averaging method for the beverage type "lemon", the 1st order exponential smoothing method for the beverage type "elderberry", and the Holt method for the beverage type "lychee". If necessary, make reasonable assumptions for parameters to be used.

The local supermarkets are to be supplied from a central warehouse location to keep the transport effort at a minimum. For this purpose, an optimal location for regional supply of the supermarkets is to be chosen. You know the average cumulated demand quantities as well as the locations of the supermarkets:

Supermarket	Location		Cumulative demand (in thousands)
	x-coordinate	y-coordinate	
1	4	9	4
2	7	3	7
3	12	2	9
4	1	5	4
5	3	7	3
6	5	1	5

Task B: Determine the optimal location using the Center of Gravity method. Discuss which location factors are **not** considered here and how they can be included in the evaluation.

To plan the next production period (month of November), various customer orders or orders from various supermarkets must be scheduled in a processing sequence. Only one filling line is available for this, so that the orders can only be processed sequentially.

Customer order	Duration (in days)	Delivery date
1	4	November 6th
2	2	November 21st
3	3	November 8th
4	7	November 20th
5	7	November 15th
6	2	November 16th
7	8	November 10th
8	3	November 21st

Task C: For the creation of possible sequences you want to apply the different priority rules of sequence planning. First discuss possible priority rules and their respective advantages and disadvantages for the given problem. Compare the possible sequences based on the average production time, the maximum delay and the number of delayed orders. Carry out the comparison and determine the processing sequence

2. ADDITIONAL INFORMATION FOR THE EVALUATION OF THE CASE STUDY

When conceptualizing and writing the case study, the evaluation criteria and explanations given in the writing guidelines should be considered.

Identification: general problem description

Concepts: Correct application of methods and technical terms

Analysis: reasonable use of comparison factors and given data, correct execution of applied methods

Conclusion: comprehensible interpretation of the results and further conclusions

Formalities: Adherence to the guidelines of chapter 4.3

Accuracy: Correctness of spelling and punctuation

Language: Quality of the linguistic expression and adequacy of language style for scientific work