

Developer Challenge background

One of our clients wants to achieve a sound and efficient production planning through the application of machine learning logic.

The tasks that this Digitale Kollegen in production planning should execute are:

- Prioritization of production orders
- Sequencing of the production orders
- Scheduling the production order on the machines

To achieve this goal, we have 2 important sources of data at our disposal:

1. Production orders
 - a. Here, all currently needed production orders are listed with all relevant information available to schedule the orders properly
2. Machine info
 - a. Here, more details are provided on the machines, e.g., what machine availability is expected in the planning period

Tasks for Developer applicants

Based on the case above, please find the challenges below:

1. Outline which fields of the given data you would use to:
 - a. Prioritize the production orders
 - b. Determine a sequence of orders for each machine
2. Please execute the following actions:
 - a. Setup a reasonable prioritization algorithm / logic to determine a priority score for each order
 - b. Create an (ideal) production order sequence for 3 machines of your choice
 - c. NOTE: We assume that the moulds are not interchangeable between different machines in the same tonnage class. Just stick with the machine number mentioned in production order sheet.

3. Briefly outline a possible approach to find the ideal order schedule for all the machines when production orders and moulds could be switched within the same tonnage class of machines.

Please note that for making proper use of the data set, cleaning of data is key. Therefore, you might want to e.g.,

- Drop unnecessary columns in the datasets/frames
- Reindex dataframes if needed
- Consider to drop rows with NaN values
- Reshape the dataframe so it matches others
- Rename column names if needed
- Consider removing outliers
- Trace down inconsistent data
- Order the data if needed

Optional;

- Try to predict or fill up missing data