Individual Assignment – DTVC, Dr. Philippe Blaettchen

Instructions

In this assignment, you are asked to develop a restructuring strategy for SFB. The assignment is based on the case description "Integration Planning at SFB (A)" found in the Lecture 10 materials on Moodle, together with the relevant data. You are required to complete the following tasks:

1. [30%] Using Python and the “employee_attrition_previous_closure.csv”, create a model to effectively predict the probability of an employee leaving after being offered an RCC. For this, you can assume that all employees in this dataset were offered an RCC. Make sure to validate your model choice.
    - Your answer to this part should be submitted as self-contained Notebook titled “prediction.ipynb” with all relevant comments.
    - Make sure to discuss, within the notebook, the most important factors in determining whether an employee will accept an RCC

2. [10%] For each employee in the dataset pertaining to the suggested closure (“employee_attrition_lyon.csv”), use your model to predict the likelihood that this employee will leave if offered an RCC.
    - Your answer to this part should be submitted as a csv-file “attrition_prediction.csv”, containing the likelihood of accepting the RCC as the only column. The order of employees should be as in the original data.

3. [20%] Recall that RCCs cannot be offered to individuals directly, but only to “objectively” defined groups of employees. Discuss how you could define such groups, and what the pros and cons are of smaller or larger group sizes. Moreover, discuss how you would measure whether your group definition is non-discriminatory.
    - Your answer should be part of your response document titled “report.pdf”

4. [30%] Formulate and solve the following as an optimization problem, using the Excel Solver: BAP wants to offer RCCs to different groups at SFB to minimize the cost of severance. It needs to cut salaries by at least 3 million Euros and at least 40 employees need to leave. Moreover, none of the three departments (HR, Sales, R&D) should be left with 80% of their previous employee count.
    - Your answer should be submitted as an Excel-file “optimization.xlsx”

- Make sure to describe your model (the three building blocks of optimization!) within your response document, “report.pdf”, and to record your solution
- Recall that you need to define groups for the RCC to be offered to as part of your model. Clearly describe your final allocation of employees to group in your response document
- You can assume that, if ten employees are offered an RCC and each has a predicted likelihood of accepting the RCC of 0.5, then 5 employees will accept the RCC, etc.

5. [10%] Discuss possible pros and cons of the prediction-and-optimization approach. What are the assumptions you are making implicitly, and how likely are they to be fulfilled?
    - Your answer should be part of your response document titled “report.pdf”

Deliverables

By April 9 (4pm), you are supposed to submit the following package:

- A notebook, titled “prediction.ipynb”
- A csv file, titled “attrition_prediction.csv”
- An Excel file, titled “optimization.xlsx”
- A response document, titled “report.pdf”, containing three sections (one, each, corresponding to questions 3, 4, and 5). This document must also include the individual course submission form - **Submissions without the individual coursework submission form filled and attached will receive 0 points**.

Assessment Criteria

Each task contributes to the overall grade based on the percentages indicated. Tasks will be evaluated against four criteria:

- appropriate use of concepts and frameworks discussed in class
- effectiveness of the proposed answer/solution
- originality and creativity of the proposed answer/solution
- organization and clarity of submitted materials