Supply Chain Analytics II: Prescriptive Analytics

For information on how to access the online sessions and further course material, see ILIAS.

Course Description

Increasing complexity of global supply chains on the one hand and increasing availability of data and processing power on the other hand lead to growing opportunities in the field of data analytics. Supply Chain Analytics II focuses on forward looking issues, that may be clustered in two parts: The first part tackles uncertainty in supply chain processes, and how to evaluate them by means of Monte Carlo Analysis. The second part looks at how to derive recommendations using optimization methods.

The course consists of recorded video lectures, case discussions, and a project. In the project, the concepts that are covered in the lectures are applied to a data set. It prepares students to identify improvement opportunities that exist in actual supply chains, to quantify possible improvements, and to control supply chain performance.

Course Administration

Class times	Monday, 14.00-15.30 Hauptgebäude Hörsaal XVIII Monday, 16.00-17.30 Hauptgebäude Hörsaal XVIII Wednesday, 14:00-15:30 Hauptgebäude Hörsaal XXI
Faculty	Andreas Fügener E-mail: andreas.fuegener@uni-koeln.de Office hours: by appointment
Secretary	Stephanie Rauscher E-mail: Rauscher@wiso.uni-koeln.de
Teaching assistant	Laura Maria Poreschack E-mail: laura.poreschack@uni-koeln.de Office hours: by appointment
Assignments	There are regular homework assignments. Students can earn bonus points by uploading complete solutions to Ilias on time and by presenting them in class. In addition, students have to work on a project assignment and upload their solution to Ilias. The project will be graded.
Grading	Project 40%, exam 60% Additionally, there will be bonus points.
Exam	19th February 2024 9am (Register via Klips until December 6th!!)
Project Deadline	7th February 2024 8pm

Language	The lectures and discussion sessions are taught in English.
Prerequisites	Basic knowledge in statistics and Python. The necessary knowledge about Python can, e.g., be acquired in the free online course Python Basics for Data Science. Successful participation in Supply Chain Analytics I: Predictive Analytics is strongly recommended.

Course Overview

1. Plenum
   The plenum sessions will take place on Mondays. During these sessions, students will present their solutions and we will discuss them. Each session will last up to 90 minutes.

2. Self-learning phases
   During the self-learning phases, you should read and understand the material in Ilias (videos, slides, practice questions). If you want to better understand the mathematical background of some of the concepts we refer to literature in the lectures. Students prepare the project in a group. We further encourage students to discuss the case studies with each other. The students are responsible for their time management.

Submissions

1. Assignments
   To earn bonus points you have to upload your complete solutions before the plenum takes place on Ilias. By uploading your solutions you agree to presenting your solutions in the plenum. You can only receive the bonus point if you actively take part in the plenum session. For each submission you can get one bonus point. Please use the Jupyter Notebooks that are provided in Ilias and add your code.

2. Project
   During the semester you will work on a project. You can find the data set and a jupyter Notebook including a detailed description of your task in Ilias. You should work on the project in groups of up to four members.

Course Agenda

For details see the course calendar below.

	Monday	Tuesday	Wednesday	Thursday	Friday
December	27	28	29	30	01
	No class -prepare for SCAI exam-		No class -prepare for SCAI exam-		
	04	05	06	07	08
	Plenum: Welcome Self-learning: Understanding Uncertainty		Tutorial (Python)		
	11	12	13	14	15
	Plenum: Understanding Uncertainty Self-learning: Monte-Carlo Simulation		Tutorial (Python)		
	18	19	20	21	22
	Plenum: Monte Carlo Simulation Self-learning: Linear Optimisation		Tutorial (Gurobi)		
	25	26	27	28	29
	Christmas Vacation		*Christmas Vacation*		
January	01	02	03	04	05
	Christmas Vacation		*Christmas Vacation*		
	08	09	10	11	12
	Plenum: Linear Optimisation Self-learning: Mixed Integer Optimisation		Tutorial (Modelling)		
	15	16	17	18	19
	Plenum: Mixed Integer Optimisation Self-learning: Logical Operators in Modelling		Gastvorlesung Camelot		
	22	23	24	25	26

Plenum: Logical Operators in Modelling Self-learning: Stochastic Optimisation		Project Q & A		
29	30	31	01	02
Plenum: Stochastic Optimisation		Summary		

Universität zu Köln

Seminar für Supply Chain Management und Management Science

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