Data Science Techniques and Real-World Applications

Zahra Sharafi

Arko Banerjee

Syllabus / Agenda

Day 1 (11.09.25) - S1.12:

- Python programming
  - Introduction
  - Modularity & Libraries
  - HW – 01: EV
- Data science toolkit
  - NumPy & Pandas
  - HW – 02: Monte Carlo Simulation
- Data Wrangling (ch2. Data Analytics for Business, Economics, and Policy)
  - Understand types of variables and observations;
  - Clean & organize data in a tidy way;
  - Merging tidy tables
  - HW – 3: Markowitz Efficient Frontier

Day 2 (18.09.2025) - S2.10 (EDV):
- Exploratory Data Analysis (ch3. Data Analysis for Business, Economics, and Policy)
  - EDA
  - Auto EDA tools
  - Visualizations
  - Tips and Libraries
  - HW – 4: Hotels Europe Compare
- Data Acquisitions
  - APIs

Day 3 (25.09.2025) - S1.02:
- Predictive Modelling, Regression Analysis, and ML techniques
- Guest Speaker

Day 4 (02.10.2025) - S2.11 (EDV):
- Your presentations

Day 5 (09.10.2025) - S1.10 (EDV):
- Relational Database
- Database Management System
- SQL Alchemy (or whatever IDE we are using)
- Guest Speaker (?)

Day 6 (16.10.2025) - S3.07
- Causality
- A case study