Detailed Contents of the AI Special Program

Module 1: Python for Data Science

Week	Day	Time	Content
1	1	9-11	Python Recap
1	1	11-13	Python Recap Exercises
1	1	14-16	NumPy and Vectorization
1	1	16-18	NumPy and Vectorization Exercises
1	2	9-11	Pandas Part 1
1	2	11-13	Pandas Part 1 Exercises
1	2	14-16	Pandas Part 2
1	2	16-18	Pandas Part 2 Exercises
1	3	9-11	Data Cleaning
1	3	11-13	Data Cleaning Exercises
1	3	14-16	Aggregation and Pivot Tables Part 1
1	3	16-18	Aggregation and Pivot Tables Part 1 Exercises
1	4	9-11	Aggregation and Pivot Tables Part 2
1	4	11-13	Aggregation and Pivot Tables Part 2 Exercises
1	4	14-16	Visualization Part 1
1	4	16-18	Visualization Part 1 Exercises
1	5	9-11	Visualization Part 2
1	5	11-13	Visualization Part 2 Exercises
1	5	14-18	Visit of DASU – Transferzentrum für Digitalisierung, Analytics und Data Science Ulm

Module 2: Fundamentals of Machine Learning

Week	Day	Time	Content
2	1	9-11	Introduction to Machine Learning
2	1	11-13	Introduction to Machine Learning Exercises
2	1	14-16	Clustering
2	1	16-18	Clustering Exercises
2	2	9-11	Association Analysis
2	2	11-13	Association Analysis Exercises
2	2	14-16	Classification
2	2	16-18	Classification Exercises
2	3	9-11	Model Evaluation and Quality Metrics
2	3	11-13	Model Evaluation and Quality Metrics Exercises
2	3	14-16	Feature Engineering
2	3	16-18	Feature Engineering Exercises
2	4	9-11	Text Classification
2	4	11-13	Text Classification Exercises
2	4	14-16	Ensemble Learning
2	4	16-18	Ensemble Learning Exercises
2	5	9-11	Introduction to Neural Networks
2	5	11-13	Introduction to Neural Networks Exercises
2	5	14-18	Visit to AI Company II

Module 3: Fundamentals of Deep Learning

Week	Day	Time	Content
3	1	9-11	CRISP-DM Project Ride Along for Transfer Learning
3	1	11-13	CRISP-DM Project Exercises
3	1	14-16	Hyperparameter Optimization
3	1	16-18	Hyperparameter Optimization Exercises
3	2	9-11	Introduction to Deep Neural Networks
3	2	11-13	Introduction to Deep Neural Networks Exercises
3	2	14-16	Introduction to CNNs
3	2	16-18	Introduction to CNNs Exercises
3	3	9-13	Transfer Learning (with Nvidia Certificate)
3	3	14-16	Introduction to RNNs
3	3	16-18	Introduction to RNNs Exercises
3	4	9-11	Text Mining
3	4	11-13	Text Mining Exercises
3	4	14-16	Introduction to Transformers
3	4	16-18	Introduction to Transformers Exercises
3	4	9-11	Introduction to LLMs
3	4	11-13	Introduction to LLMs Exercises
3	4	14-18	Visit to AI Company III

Module 4: Capstone Project – Real Life AI Competition

It is planned to present the participants of the AI special program with real life AI problems to be solved in a competitive way. Here, THU will leverage its cooperations with local companies and especially DASU to give the students insights into what kind of problems they will face in industry. Furthermore, the interaction between Korean and German students is meant to be fostered by a joint hackathon to start the project module.

Week	Day	Time	Content
4	1	9-14	Joint Korean – German Hackathon as Introduction to Competitions
4	1	15-16	Presentation of Real Life Problem
4	1	16-17	Preparation for Project Pitch
4	1	17-18	Project Pitches
4	2	9-18	Supervised Project Work (with Lunch Break)
4	3	9-18	Supervised Project Work (with Lunch Break)
4	4	9-18	Supervised Project Work (with Lunch Break)
4	5	9-13	Project Work Finish + Preparation of Presentation
4	5	14-18	Project Presentations