SOFT PBA AI Course Exam Project

This project is designed as applied research and experimental development of a comprehensive software application that leverages artificial intelligence (AI) techniques and algorithms to solve a significant problem or address a specific domain.

It should demonstrate your understanding of AI concepts and your ability to apply them in practice.

The project activities involve systematic and creative work. You will be asked to find novel, uncertain, and reproducible results by applying the AI technologies experienced in class.

# Key Components

## Business case

Select one or more business or social domains, where AI can bring value. Formulate a problem statement, context, research question(s), and hypotheses for your AI solution.

## Data

Searching Internet and other media, find relevant data sources that can be used in your experiments.

Ingest and pre-process the collected data into proper data structures, applying data wrangling techniques. Explore and explain the data by statistics and visualisation.

## AI Models

Select three or more AI methods and algorithms that could solve the problem. Create, train, and/or augment relevant data models applying supervised or unsupervised machine learning, artificial neural networks, knowledge graphs, or large language models.

Test the models created by the learners operating on test data sets, as well as on new data sets (training, test and validation sets)

## Quality Assessment

Select appropriate statistics for measuring the quality of your models. Calculate measures assessing the quality of the models and their ability to produce intelligent prediction, prescription, or generation.

Iterate the data modelling operations, improving the quality of the models, as much as possible.

Compare the assessment results and use them to select the best performing models. Save these models in data stores for further implementation.

## AI Application

Implement the data and the successful AI operations into an interactive application with simple user interface, presenting the process and results in human-understandable form.

Apply various visualisation and explanation techniques to guide the users through the application and interpret the insights revealed by the AI algorithms.

Deploy the solution locally (on localhost) or on a cloud of your choice.

# Development Process

Work in groups of 2-4 members.

Divide the project into manageable tasks and assign them to different team members.

Use Github repository as a codebase for collaboration and tracking changes, as well as a source of discussion at the exam.

# Exam

The exam is individual. The student’s grade is based equally on student’s presentation and project’s quality.

At the exam, the students discuss and demonstrate design decisions, implementation details, and results achieved by the project’s solution, showcasing their knowledge and skills acquired throughout the course.

The quality of the solution is assessed according to various criteria, including:

* AI relevance
* compliance with the requirements
* problem statement and work hypotheses correctness
* argumentation of choices
* sufficient documenting of procedures and results
* proper use of resources
* applying data exploration, engineering, and integration techniques
* proper implementation of statistics and AI algorithms
* variety and usability of visualisations
* interpretation of results

It is important to enable reproduction of the project functionality and reported results.

# Exam Pre-requisites

As a pre-requisite, you need to

* have collected 80% of the study points, given for fulfilment of the semester assignments, according the curriculum
* have submitted to Wiseflow one page of text in pdf format, on which you provide
* the title of the project
* the names of the team members developing it, and possibly their individual role and contribution to the project
* extended resume of the project statement and solution (what is the project and why is it useful)
* the URL of the Github repository, where the project code and Readme document are hosted
* the Readme document includes problem statement, motivation, theoretical foundation, argumentation of choices, design, code, artefacts, outcomes, and implementation instructions, as appropriate.
* the URL of the cloud location, where the application runs (if any)

*Steven and Dora*

*Lecturers*