INTERNATIONAL
UNIVERSITY OF
APPLIED SCIENCES

PROJECT REPORT

Task for Course: DLBAIBEPAIPC01 – Project: AI Product
Commercialisation

CONTENT

1. TASK

You can choose from the following tasks for your project report. Please choose one of them to work on in your project report.

Note on copyright and plagiarism:

Please take note that IU Internationale Hochschule GmbH holds the copyright to the examination tasks. We expressly object to the publication of tasks on third-party platforms. In the event of a violation, IU Internationale Hochschule is entitled to injunctive relief. We would like to point out that every submitted written assignment is checked using a plagiarism software. We therefore suggest not to share solutions under any circumstances, as this may give rise to the suspicion of plagiarism.

1.1. Task 1: Market-Insight Bot – Analyze Yelp reviews with NLP

Background: Yelp reviews contain valuable opinions that help businesses understand what makes customers satisfied or unhappy. By analyzing the text and star ratings of these reviews, we can uncover common patterns, words, and sentiments that influence customer satisfaction.

Task: Use a provided Yelp reviews dataset to identify frequent positive and negative words in reviews with 1-star and 5-star ratings. Then, visualize your findings and explain what local businesses can learn from this analysis.

Steps:

- **Start with a Canvas model**: Identify the key problem, users (e.g., farmers, retailers), and your forecasting value proposition.

- **Utilize project management tools like Jira, Trello, or Asana (optional)**: Track your tasks and include a screenshot of your board with at least 5 cards.

- **Load and Explore the Data**: Use pandas to read and explore the Yelp reviews dataset. Plot the distribution of reviews per star rating.

- **Clean and Preprocess Text**: Lowercase all text, remove punctuation, and prepare the text for analysis using regular expressions and Python functions.

- **Tokenization and Word Count**: Split text into words and count the most frequent terms in both 1-star and 5-star reviews.

- **Sentiment Analysis Using Word Lists:** Use provided positive and negative word lists to measure sentiment in each review and compare average sentiment by star rating.

- **Visualizations:** Create bar plots and word clouds to highlight the most common words and show the distribution of sentiment scores and review ratings.

- **Interpretation and Business Insight:** Write a short summary (4–6 sentences) on what your analysis reveals to local business owners.

Deliverables:

- A working Jupyter Notebook with Prophet forecast and markdown explanations.
- Visualizations of trends, seasonal components, and change points.
- Business insight summary and dashboard sketch.
- Screenshot of project planning board (Jira, Trello, or Asana) and canvas model.

Data:

- Yelp open dataset: https://www.kaggle.com/datasets/yelp-dataset/yelp-dataset

- Yelp logo (for visuals): https://commons.wikimedia.org/wiki/File:Yelp_Logo.svg

1.2. Task 2: AvoCast – Forecast U.S. Avocado Prices with Prophet

Background: Avocado prices rise and fall with season, weather and demand. Better forecasts help growers, wholesalers, and supermarkets plan stock and promotions. In this project, you'll explore historical avocado pricing data and use Facebook's Prophet model to build a forecasting tool for one region in the U.S.

Task: Build a time-series prototype that predicts weekly avocado prices for a selected U.S. region using the Prophet library. Evaluate your forecast and explain how it can support business decisions.

Steps:

- **Start with a Canvas model:** Identify the key problem, users (e.g., farmers, retailers), and your forecasting value proposition.

- **Utilize project management tools like Jira, Trello, or Asana (optional):** Track your tasks and include a screenshot of your board with at least 5 cards.

- **Load and Explore the Data:** Load avocado.csv from Kaggle using pandas. Review columns such as date, average price, type, and region. Choose one region (e.g., TotalUS).

- **Prepare for Prophet:** Rename your date column to ds and target column (price) to y. Sort chronologically, fill in any missing dates, and resample to weekly frequency if needed.

- **Tune the model:** Fit a Prophet model using yearly and weekly seasonality. Add a holiday (e.g., Thanksgiving). Hold out the last 20 percent of the data for testing. Report forecasting accuracy using MAE and MAPE.

- **Visualize & Explain:** Plot the forecast, seasonal components, and change points. In markdown, explain Prophet's additive time-series model using plain language.

- **Business Translation:** List three concrete retailer actions based on your forecast (e.g., adjust pricing, manage promotions, optimize stock). Sketch a dashboard that would help retailers or growers interpret the forecasts.

Deliverables:

- A working Jupyter Notebook with Prophet forecast and markdown explanations.
- Visualizations of trends, seasonal components, and change points.
- Business insight summary and dashboard sketch.
- Screenshot of project planning board (Jira, Trello, or Asana) and canvas model.

Data:

- Avocado Dataset: https://www.kaggle.com/datasets/neuromusic/avocado-prices

- Prophet Documentation: https://facebook.github.io/prophet/

- Example holiday list: U.S. Thanksgiving (4th Thursday of November)

2. ADDITIONAL INFORMATION FOR THE EVALUATION OF THE PROJECT REPORT

When conceptualizing and writing the project report, the evaluation criteria and explanations given in the writing guidelines should be considered.

Transfer: Describe the approaches and models you applied for developing your solution, and justify your choices for each. You may have specified or modified specific steps; present and rationalize those, too.

Documentation: Ensure that the genesis of the outcome is documented comprehensively and comprehensibly.

Resources: Procure all necessary resources, such as data, applications, technical equipment, software, and tools. Ensure efficient utilization of the available time and employed materials.

Process: Document your approach extensively and continuously reflect upon it, at the latest in the concluding chapter. Highlight the limitations of your methodology.

Creativity: Is there a similar product already? What level of innovation is demonstrated by the solution?

Quality: Does the outcome effectively address the previously described problem?

Note: The provided literature doesn't need to be exhaustively covered. It should merely facilitate the entry into the topic and offer initial orientation.

3. TUTORIAL SUPPORT

In this project report task, several support channels are open; as the student, it is your responsibility to select your preferred support channel. The tutor is available for technical consultations and for formal and general questions regarding the procedure for processing the project report. However, the tutor is not required to approve outlines or parts of texts and drafts. Independent preparation is part of the examination work and is included in the overall evaluation. However, general editing tips and instructions are given in order to help you get started with the project report.