**Technical Test - Mentor Data Science & AI**

**Technical Test Objectives:**

Technical test ini dikhususkan sebagai proses seleksi dan penilaian untuk posisi Mentor - AI & Data Science. Tujuan pokok dari test ini adalah ingin mengetahui technical skills dari kandidat dalam membuat aplikasi AI.

**Cara Pengerjaan**

Kirimkan hasil pengerjaan technical test ke email berikut [david@skilvul.com](mailto:david@skilvul.com), cc [mentors@skilvul.com](mailto:mentors@skilvul.com), [natasha@markoding.com](mailto:natasha@markoding.com), [herviyani@markoding.com](mailto:herviyani@markoding.com) , [debby@skilvul.com](mailto:debby@skilvul.com) maksimal 3 hari setelah kamu menerima instruksi pengerjaan technical test ini.

Jika ada pertanyaan, silahkan ditanyakan melalui tim rekrutmen kami yang terhubung melalui chat atau email ke [debby@skilvul.com](mailto:debby@skilvul.com), cc [david@skilvul.com](mailto:david@skilvul.com).

### **Case Study: Predictive Analytics for E-commerce**

**Business Context:**

You are hired as a Data Science and AI for an e-commerce company named "Terra Store." Terra Store is looking to enhance its marketing strategy by predicting customer purchase behavior based on historical data. The company wants to build an AI-powered application that can provide insights into which products a customer is likely to purchase next.

**Problem Statement:**

Terra Store has provided you with a dataset containing information about customer interactions, purchases, and product details. Your task is to **develop a web-based AI** **application** that predicts the next product a customer is likely to buy. The application should be user-friendly, allowing marketing teams to target customers more effectively.

**Data Description:**

The dataset includes the following information:

* **Customer Interactions**:
  + Customer ID
  + Page views
  + Time spent on the website
* **Purchase History**:
  + Customer ID
  + Product ID
  + Purchase date
* **Product Details**:
  + Product ID
  + Category
  + Price
  + Ratings

This is the example datasets you can also use:

<https://drive.google.com/drive/folders/1dFtJDHmSsJ9Mw6okNEnJoVN1_seNI3Co?usp=sharing>

**customer\_interactions.csv** includes information about customer interactions on the website, such as the number of page views and time spent.

**purchase\_history.csv** contains records of customer purchases, including the product purchased and the date of purchase.

**product\_details.csv** provides details about each product, such as its category, price, and ratings.

You can customize the dataset by adjusting the number of records.

**Key Tasks:**

**Data Exploration and Preprocessing:**

* + Explore the provided dataset to understand the characteristics of customer interactions and purchase history.
  + Perform any necessary data preprocessing steps to handle missing values or outliers.
* **Model Development:**
  + Build a predictive model that can forecast the next product a customer is likely to purchase.
  + Choose an appropriate machine learning algorithm and explain the reasons behind your selection.
  + Train the model on historical data and evaluate its performance using relevant metrics.
* **Web Application Development:**
  + Create a web-based interface for the predictive analytics application.
  + Users should be able to input a customer ID, and the application should return the top N recommended products for that customer.
  + You can use any framework for web applications, but you must use Python for AI development
* **User Interface (UI) Design:**
  + Design a user-friendly interface that allows marketing teams to easily interact with the application.
  + Visualize the predicted product recommendations in an understandable format.
* **Documentation:**
  + Document the entire process, including data exploration, model development, web application development, and deployment.
  + Include a README file with clear instructions on how to use the application.

**Deliverables:**

* Source code of the web-based AI application in GitHub Repository
* Website URL
* Documentation explaining the approach, code structure, and any key decisions made.
* A README file with instructions for running the application.

**Evaluation Criteria:**

* Accuracy and effectiveness of the predictive model.
* User interface design and usability.
* Code quality, organization, and documentation.
* Creativity in addressing challenges.
* Clarity and completeness of documentation.

**Note to Candidates:**

* You are encouraged to showcase your creativity and problem-solving skills.
* Provide clear explanations for the choices you make in the data preprocessing and model development phases.
* The goal is to create a practical and effective solution that aligns with real-world business needs.