### Technical Assignment for Evaluating AI Talent for Workplete

This technical assignment is designed to assess candidates' ability to execute Workplete's vision of creating AI employees for B2B clients. It evaluates their skills in programming, data management, machine learning, AI deployment, and problem-solving—key areas critical to the success of your project.

---

# Assignment Overview

**Objective**: Candidates will develop a prototype of an AI employee capable of automating a specific B2B task (e.g., data entry, customer support, or lead scoring). The assignment will assess their ability to design, build, and deploy an AI-driven solution while ensuring scalability, security, and alignment with business objectives.

**Duration**: 7 days
**Deliverables**:

1. Functional prototype with codebase.
2. Documentation explaining the architecture, implementation details, and deployment process.
3. Presentation (10 minutes) outlining the solution's features and business impact.

---

# Assignment Details

## Scenario

You are tasked with building an AI employee for a B2B client in the logistics industry. The client wants to automate lead scoring for their sales team using historical data. The AI employee should:

- Analyze customer data (e.g., past interactions, purchase history).
- Predict the likelihood of converting leads into paying customers.
- Provide actionable insights to prioritize high-potential leads.
- Make it more personalised with voice using eleven labs or any other voice APIs.
- It should prompt user feedback during process for eg: "if AI is scrapping sales leads , it should ask if the data is good or not?" .Basically human should be in the loop .

---

# Technical Requirements

### 1. Programming & Frameworks

- Use Python as the primary programming language.
- Implement machine learning models using frameworks like TensorFlow or PyTorch.
- Ensure code is modular, efficient, and well-documented.

### 2. Data Preparation

- Use a provided dataset (or generate synthetic data if necessary) that includes customer attributes and lead conversion outcomes.
- Clean and preprocess the data (e.g., handle missing values, normalize features).

### 3. Model Development

- Build a machine learning model (e.g., logistic regression, decision tree, or neural network) to predict lead conversion probabilities.
- Fine-tune hyperparameters to optimize model performance.
- Evaluate the model using metrics like accuracy, precision-recall, and F1 score.

### 4. Integration & Deployment

- Create a REST API using Flask or FastAPI to serve the model predictions.
- Deploy the API locally or on a cloud platform (e.g., AWS, Azure, or Google Cloud).
- Demonstrate how the API can integrate with a CRM system for real-time lead scoring.

### 5. Data Visualization

- Develop a dashboard (using tools like Dash or Streamlit) to display:
    - Lead conversion probabilities.
    - Key insights from the model (e.g., top factors influencing predictions).
    - Performance metrics of the model.

### 6. Security & Ethics

- Implement basic security measures for the API (e.g., authentication tokens).
- Address potential biases in the dataset or model predictions.

---

# Evaluation Criteria

| Category | Weightage | Evaluation Metrics |
|---|---|---|
| **Technical Skills** | 40% | Code quality, use of frameworks/tools, scalability of solution |

| | | |
|---|---|---|
| **Problem-Solving** | 20% | Logical approach to data preparation and model development |
| **Deployment & APIs** | 15% | Successful deployment of API and integration capabilities |
| **Data Visualization** | 10% | Clarity and usability of dashboards |
| **Documentation & Ethics** | 10% | Clear documentation and consideration of ethical implications |
| **Presentation Skills** | 5% | Ability to communicate ideas effectively and align them with business objectives |

---

# Submission Guidelines

1. Submit the codebase in a GitHub repository with clear instructions on how to run the project locally.
2. Include a PDF report covering:
    - Problem statement
    - Approach taken
    - Challenges faced
    - Future improvements
3. Prepare a short loom video demo showing:
    - Model predictions in action
    - Dashboard functionality
4. Be ready for a live Q&A session during your presentation.

---

# Additional Notes

## Skills Being Assessed:

- **Programming Proficiency**: Efficient coding in Python; familiarity with libraries like Pandas, NumPy, TensorFlow/PyTorch.
- **Data Engineering & Analysis**: Ability to clean datasets and extract meaningful insights.
- **Machine Learning Expertise**: Understanding of algorithms and optimization techniques.
- **API Development & Deployment**: Knowledge of RESTful APIs and cloud platforms.
- **Critical Thinking & Problem-Solving**: Handling challenges like biased datasets or overfitting issues.
- **Communication Skills**: Explaining technical concepts to non-technical stakeholders.

## Bonus Points:

- Use advanced techniques like feature importance analysis or explainable AI (e.g., SHAP values).
- Implement CI/CD pipelines for automated deployment.
- Demonstrate adaptability by proposing additional use cases for the AI employee beyond lead scoring.

---