Assignment: End-to-End Machine Learning Workflow with KizenML, XAI, and Cloud Deployment

Total Marks: 30

**Objective**:

In this assignment, you will build a complete end-to-end machine learning (ML) workflow using KizenML and Explainable AI (XAI) tools. You are free to choose any other tools or frameworks that support the workflow, including cloud services like AWS or Azure for deployment. The final deliverables include a screen recording explaining your process and detailed documentation.

**Tasks and Marks Distribution:**

**1.Data Collection and Preprocessing (4 Marks):**

•Task: Select an appropriate dataset and perform data preprocessing, including data cleaning, feature engineering, and scaling/normalization.

•Details: Explain the choices made during preprocessing and how they impact the model. Use KizenML or other tools for AutoEDA if applicable.

•Marks: 4 Marks

**2.Model Selection, Training, and Hyperparameter Tuning (6 Marks):**

•Task: Train multiple models, tune hyperparameters, and select the best-performing model.

•Details: Utilize tools like AutoML, KizenML, or others for model selection and hyperparameter tuning. Document the experimentation process and justify your model choice.

•Marks: 6 Marks

**3.Explainable AI (XAI) Implementation (6 Marks):**

•Task: Apply Explainable AI techniques to make your model’s predictions interpretable.

•Details: Use XAI tools such as SHAP, LIME, or others to provide insights into your model’s decision-making process. Discuss the importance of interpretability in your model and how XAI tools helped achieve it.

•Marks: 6 Marks

**4.Model Deployment Using Cloud Services (6 Marks):**

•Task: Deploy your trained model using free-tier cloud services such as AWS or Azure.

•Details: Create an API or web interface using services like AWS Lambda, Azure Functions, or any other cloud service. Demonstrate how to make predictions using the deployed model.

•Marks: 6 Marks

**5.Workflow Documentation and Explanation (8 Marks):**

•Task: Document the entire end-to-end workflow and provide a screen recording that explains the process.

•Details:

•Screen Recording (4 Marks): Record a video walkthrough of your workflow, explaining each step and the tools used.

•Documentation (4 Marks): Provide detailed written documentation that includes code snippets, explanations of each step, challenges encountered, and how they were resolved.

•Marks: 8 Marks

**Deliverables:**

•Screen Recording: A video explaining the end-to-end workflow, from data collection to model deployment and XAI implementation.

•Code Repository: Submit a well-organized repository containing all code, including scripts for data preprocessing, model training, XAI implementation, and deployment.

•Documentation: A detailed report that covers each step of the workflow, with explanations, challenges, and solutions.