**Project Design Phase-I**

**Solution Architecture**

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| **Date** | **23rd October 2023** |
| **Team ID** | **593053** |
| **Project Name** | **Project - Predicting Mental Health Illness Of Working Professionals Using Machine Learning** |
| **Maximum Marks** | **4 Marks** |

**Solution Architecture:**

Our solution optimizes mental health assessment for working professionals by harnessing machine learning algorithms. By leveraging comprehensive data and advanced modeling techniques, it enhances early detection and intervention, contributing to improved well-being and productivity.

1. **Data Collection and Gathering:** Gather diverse data, including employment history and stress factors, to build a holistic dataset for analysis.
2. **Data Preprocessing and Feature Engineering:** Cleanse and transform data, creating meaningful features essential for accurate mental health predictions.
3. **Model Selection and Building:** Explore models like Logistic Regression, Random Forest, and Neural Networks, evaluating based on accuracy and reliability.
4. **Training and Validation:** Split data, train models on one subset, and validate on another to ensure performance and avoid overfitting.
5. **Hyperparameter Tuning and Optimization:** Fine-tune models through grid search, optimizing parameters for enhanced predictive power.
6. **Model Evaluation and Interpretability:** Assess model performance, interpret predictions, and visualize key features for transparent decision-making.
7. **Real-time Prediction and Analysis:** Deploy the model for real-time predictions, allowing professionals to input data and receive instant mental health assessments.
8. **Continuous Learning and Adaptation:** Implement a feedback loop, updating the model with new data to ensure relevance and accuracy over time.
9. **Ethical Considerations and Privacy:** Adhere to ethical guidelines, ensuring data privacy and obtaining informed consent from participants, respecting their confidentiality and well-being.

**Solution Architecture Diagram:**

