



DEPARTMENT OF APEX INSTITUTE OF TECHNOLOGY

PROJECT PROPOSAL

1. Project Title: -

Early-stage diabetes risk prediction

2. Project Scope: - (Max 500 words)

The project focuses on developing an AI and ML-driven solution for early-stage diabetes risk prediction. It entails preprocessing and analysis of existing datasets to identify pertinent variables like weight loss, weakness, and other potential indicators associated with diabetes risk factors. Advanced algorithms such as neural networks, decision trees, and ensemble methods will be employed to construct predictive models capable of accurately assessing the likelihood of early-stage diabetes onset. Feature engineering techniques will enhance model interpretability and performance. The validation process will involve rigorous evaluation against existing diagnostic approaches to ensure reliability and effectiveness. Furthermore, the project aims to integrate the developed predictive model into user-friendly interfaces or applications for seamless accessibility by healthcare professionals and individuals. Documentation and reporting will document the methodology, implementation details, and outcomes, contributing to the advancement of predictive healthcare analytics and promoting awareness of preventive healthcare measures.

3. Objectives: -.

- **Database Selection:** Select databases containing diverse demographic, clinical, and lifestyle variables relevant to diabetes risk factors, ensuring data integrity and representativeness for robust predictive modeling.
- **Model Development:** Develop a robust predictive model for early-stage diabetes risk assessment.
- **Visualization and Interpretability:** Use visualization tools to present insights and ensure model interpretability.
- **Evaluation and Optimisation:** Explore various ML algorithms, optimize hyperparameters, and evaluate performance using key metrics.
- **Research Contribution:** Contribute to already done research on this project and provide insights of old research papers.
- **Future Directions:** Facilitate seamless integration of the predictive model into healthcare systems for widespread accessibility and usability.

4. Requirements: -

➤ Hardware Requirements

1. Standard desktop or laptop computer with recommended 4GB RAM
2. Adequate storage for dataset handling and model training (may vary on datasize)
3. Optional: GPU for accelerated model training (e.g., NVIDIA CUDA -enabled GPU)

➤ Software Requirements

1. Python programming environment with NumPy, Pandas, NLTK, Scikit -learn, TensorFlow, & Matplotlib libraries
2. Integrated Development Environment (IDE) such as Jupyter Notebook or VS Code
3. Optional: Database management system for efficient data storage and retrieval

STUDENTS DETAILS

Name	UID	Signature
Yash Rana	20BCS6798	
Ayushi Singh	20BCS6773	
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Anshul Kalia	20BCS6771	

APPROVAL AND AUTHORITY TO PROCEED

We approve the project as described above, and authorize the team to proceed.

Name	Title	Signature (With Date)
Amit Vajpayee (E14118)	Supervisor	