Project Synopsis

Title: Design and Development of a Biomedical Question-Answering System

1. Problem Statement

In the medical field, a very large number of research papers and clinical articles are published every day. Doctors, researchers, and students often struggle to get direct answers to their questions from this huge collection. Normal search engines only show documents, not exact answers. This project aims to make a Biomedical Question-Answering (QA) system that can give short and correct answers from biomedical data. This will help in study, research, and medical decision-making.

2. Objective

To develop a system that can take health-related questions in simple language and provide relevant answers using already available NLP or deep learning models.

3. Scope of Work

- Make a QA system using existing NLP/deep learning models.
- Use standard biomedical datasets or research papers as the knowledge source.
- Fine tune the model for biomedical question answering.
- Create a simple web or command-line tool for testing questions.
- Check performance using appropriate metrics.

4. Dataset Description

Dataset: Standard biomedical QA dataset

- Contains question-answer pairs from biomedical research papers.
- Available in a structured format for easy use.

5. Tools & Technologies

- Python (NLP and deep learning libraries).

- Dataset in JSON or text format.
- Optional frontend: simple web app using tools like Streamlit or Flask.

6. Expected Outcome

- A working Biomedical QA system that can:
    - Take natural language questions (example: *What causes Alzheimer's disease?*)
    - Find related biomedical text.
    - Give a short and correct answer.
- Compare results with different NLP/deep learning models.
- Understand challenges like medical terms and confusing questions.

7. Conclusion

This project will make biomedical knowledge easier to access by giving direct answers instead of long documents. It shows how NLP can be used in healthcare and supports ongoing research in medical informatics. The system can help researchers, students, and maybe even patients in the future.