# Project Planning

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Context

- POSYDON : POpulation SYnthesis with Detailed binary-evolution simulatiONs
- Developed by a collaborative group of scientists primarily at Northwestern University
- Simulates stellar evolution of binary stars
- Generates massive amounts of data as simulation output
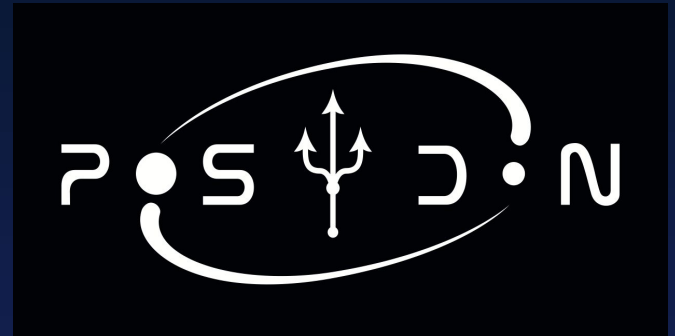
Project Overview

- **Objective:** Develop a system to manage and analyze simulated binary star data
- **Key Features:**
  - Import multivariate time-series simulation data into relational database
  - Provide sample SQL queries
  - Enable custom queries through natural language processing
- **Deliverables:**
  - Relational database
  - User Interface for writing and viewing SQL queries
  - Sample SQL queries
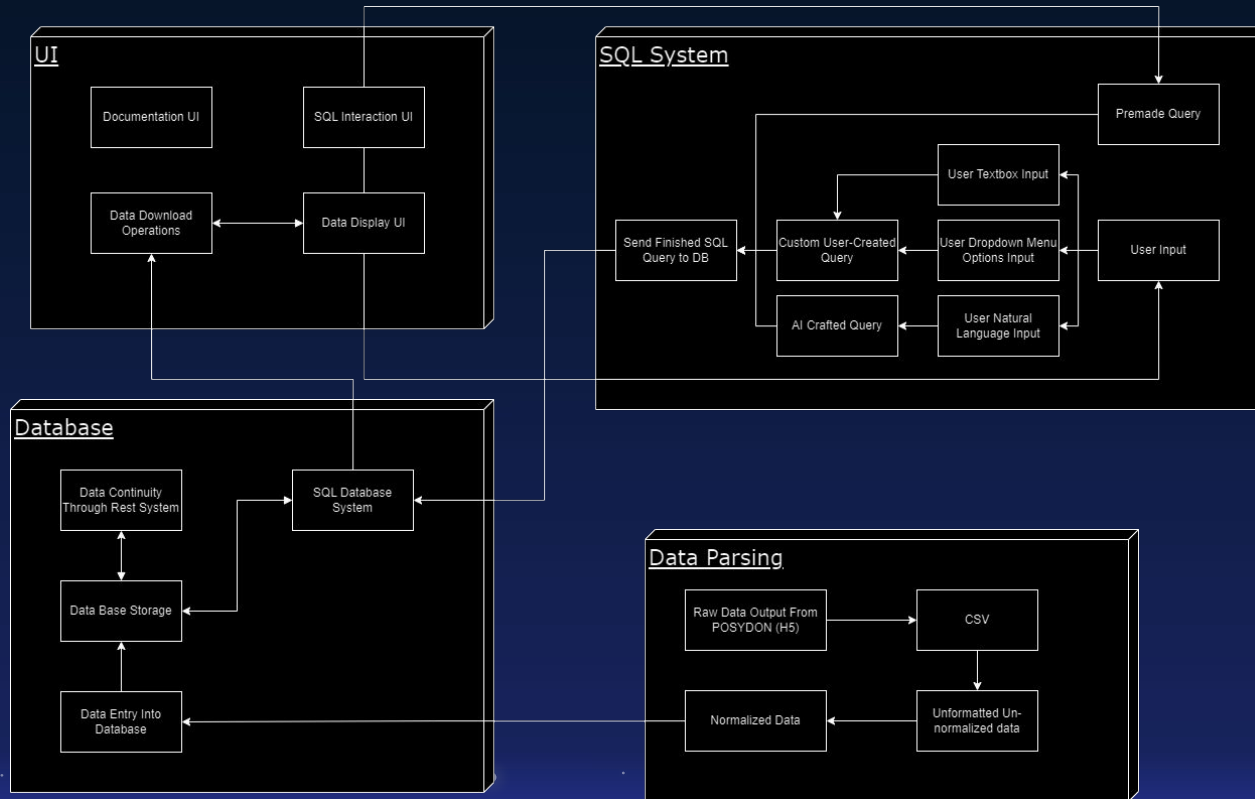
Project Management Style

- Agile Management Style
- Flexibility and adaptability based on new requirements
- Segmentation allows for regular feedback to ensure customer needs are met
- Iterate on feedback without hard deadline
- Easier to break up work
- Less risk of time waste due to delays in previous stage
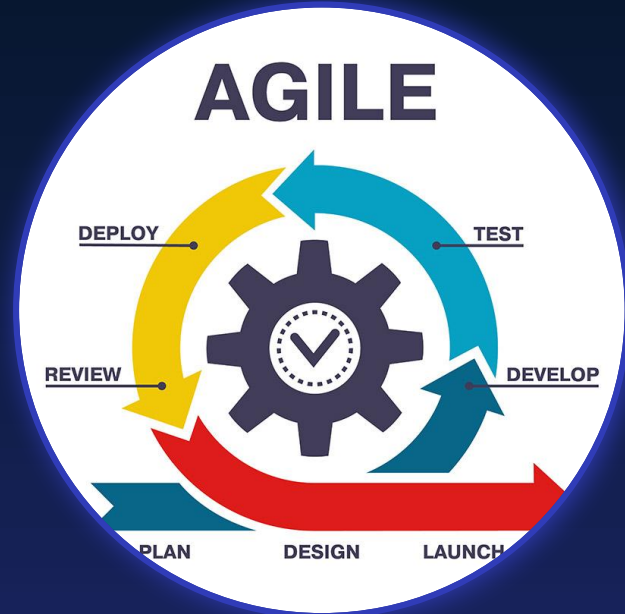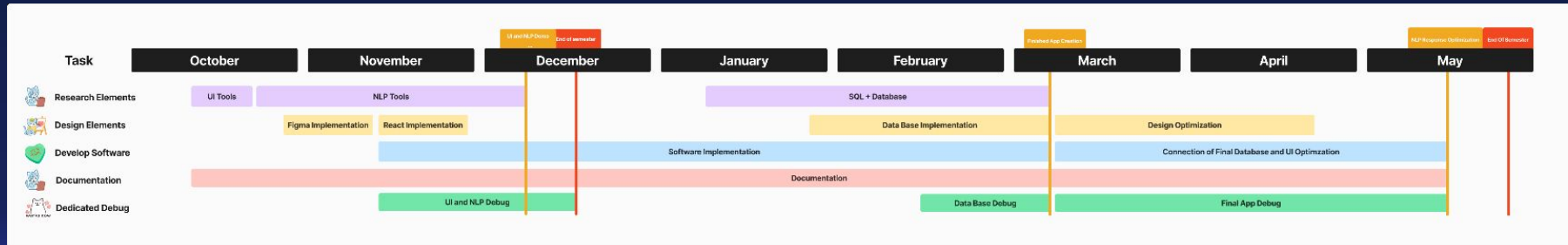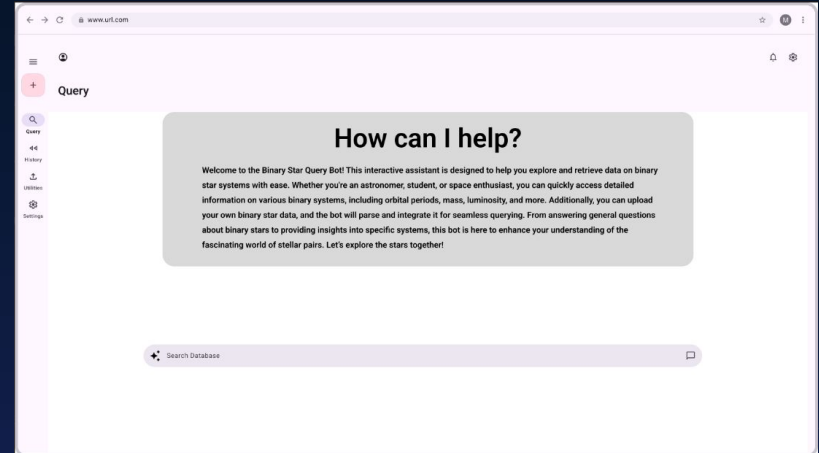
Task Decomposition

Overview Diagram

Milestones

- December – Demo UI
- December – Demo natural language translation
- March – Finish application creation
- May – NLP Response optimization

Risks and Mitigation

- Relying on an LLM for natural language processing may lead to SQL queries that don't accomplish what they intend to.
  - Software will determine if a query will successfully retrieve a response given the schema and retry once if not
  - Queries will display in a text box for confirmation before interacting with the database
- Users may attempt to use the user interface to add incorrect data to the database
  - Software will evaluate if query will add new data and block it

Conclusions

- POSYDON is a project that collects data of binary star evolution through various simulations
    - Terabytes of data have been generated
    - Missing a tool to query data
- Our project aims to design a tool for managing this data in a database
- Our team is utilizing Agile methodologies
- Software and user validation will ensure proper query syntax