# 17630 - Final Project Proposal

- **Team Members:** Blaise Niyonkuru , Elie Kagabo , Jiyun Shen , Shubham Kachroo
- **Title:** AI-Powered Student Guide: Navigating Academic Journey from Induction to Graduation
- **Short description:**
  - By the end of the semester, we will develop an AI-powered chatbot that helps new CMU students navigate their academic journey. The chatbot will offer structured, prompt-driven responses to questions regarding academics and other key stages of the student experience. We aim to create a user-friendly tool that simplifies complex processes like course registration and accessing campus resources and enhances the overall experience for new students.
- **Resources Usage:** (datasets, libraries, frameworks, and services)
  - Datasets:
    - CMU-specific academic policies, course catalogs, and campus resource guides.
    - Student FAQs and common queries (can be gathered from CMU's student services).
    - Pre-existing datasets for fine-tuning (if available).
  - Libraries and Frameworks:
    - OpenAI API for the core language model.
    - Frameworks like LangChain for prompt chaining and retrieval-augmented generation.
    - Streamlit or Flask will be used to build a simple chatbot interface.
  - Services:
    - Cloud hosting (e.g., AWS, Google Cloud, etc.) for deploying the chatbot.
- **Tasks List:**
  - Research and Data Collection:
    - Gather CMU-specific academic and campus resource information.
    - Identify common student queries and pain points.
  - Prompt Engineering:
    - Design hierarchical prompts for different stages (e.g., induction, academics).
    - Implement Chain of Thought and Retrieval-Augmented Generation strategies.
  - Model Development:
    - Fine-tune GPT-4 (if necessary) using CMU-specific data.
    - Build a chatbot interface for user interaction.
  - Testing and Iteration:
    - Test the chatbot with sample queries and refine prompts.
    - Human in the loop to gather feedback from CMU students.
  - Deployment:
    - Deploy the chatbot on a cloud platform for accessibility.
- **Project risks:**
  - Unclear Scope: The project can become broad if we cover every stage of the student journey. We'll focus on induction and academics to mitigate this and expand later.
  - Learning Curve: Team members must learn new tools (e.g., LangChain, RAG, Vector databases). We'll allocate time for learning and use more straightforward frameworks initially or contact the staff teaching team for assistance.
  - Data Limitations: A lack of CMU-specific data could limit the chatbot's accuracy. We'll start with publicly available resources and contact CMU student services for additional data.
  - API Costs: Using cloud services could involve costs. We'll monitor usage and explore free tiers or educational discounts.
- **References:**
  - From Questions to Insightful Answers: Building an Informed Chatbot for University Resources. arXiv preprint arXiv:2405.08120.
  - AI-Driven Student Assistance: Chatbots Redefining University Support. In 18th International Technology, Education and Development Conference (pp. 1234-1240). Valencia, Spain.