CodeInCStructor.ai

AN AI-BASED “CS CODING-INSTRUCTOR”

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INTRODUCTION

An AI Teaching Assistant with an interactive platform where students receive real time personalized feedback on their coding assignment submissions. The model guides them in the right direction towards the answer. The TA also helps Professors ideate new, unique exercises tailored to their curriculum, fostering critical thinking and active learning among students.

PROBLEM ADDRESSED AND TARGET USERS

First-year Computer Science (Tech) students:

- Struggle completing coding assignments with syntax, logical errors. Lack personalized feedback.
- Don’t understand area of mistake, end up looking at solution online.
- Increasing chances of plagiarism. Hesitant to ask for help on basic clarifying questions.

Teaching Assistants (bridge):

- Cannot give students personalized feedback. Expensive to hire.
- Not able to focus on their own thesis or projects

Professors:

- Challenges in creating unique exercises every semester for large classes
- Risk of plagiarising old assignments from online resources by students

SOLUTION

Student Mode:

- Interactive platform with a familiar Chat Bot-like interface, students upload their attempts to exercises, receive personalized feedback & save the correct answer on a cloud platform for future reference.
- The model guides them toward the answer rather than giving away the solution.
- Students have “Restricted Attempts” to promote active thinking & implement the feedback in their attempts.

Professor Mode:

- They can generate ideas for unique exercises tailored to their curriculum.
- It helps generate new ideas and assign questions based on set difficulty levels.
- Provides sample test cases for reference.

TECHNOLOGIES USED

Cloud Firestore

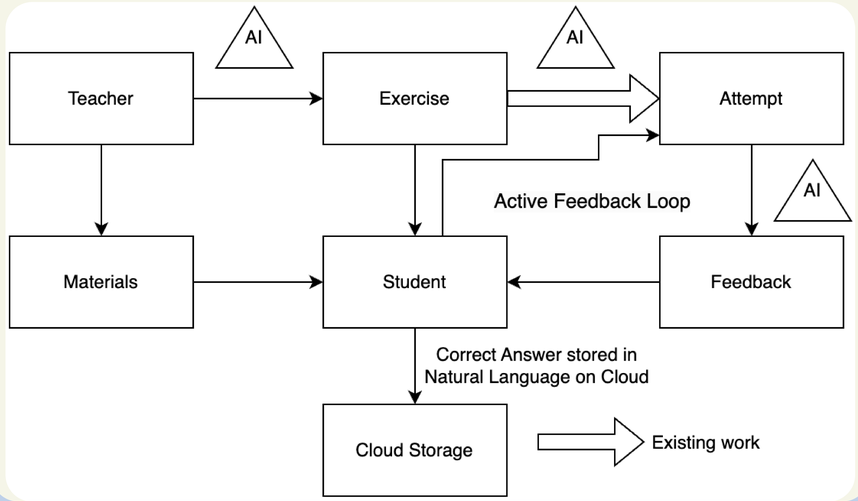
Flask
web development, one drop at a time

GPT 3.5 Turbo API Chat Completion Module

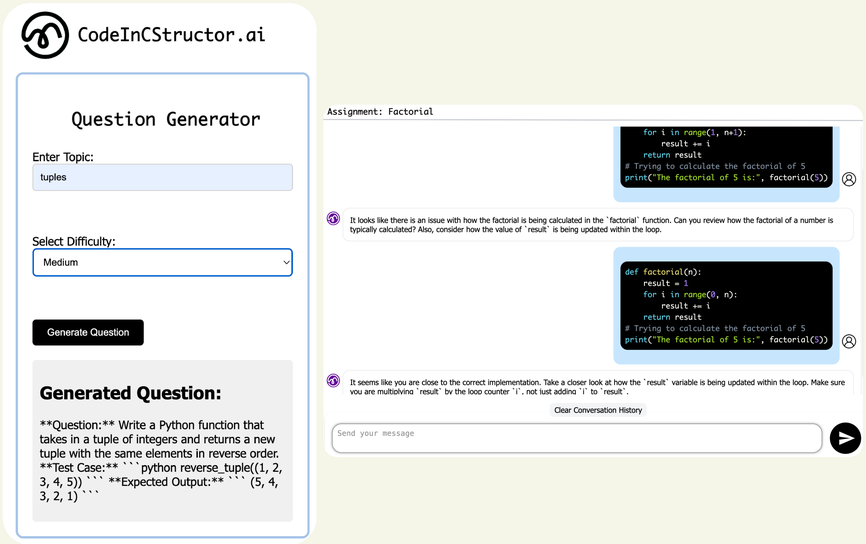
O’REILLY
Prompt Engineering for Generative AI
Future-Proof Inputs for Reliable AI Outputs

HTML CSS JS

DESIGN DIAGRAM



INTERFACE



IMPACT

Educational Impact:

- Strengthens coding proficiency, active learning, and problem-solving skills, preparing students for technical interviews & career opportunities.

Financial and Social Impact:

- Potentially reduce the need for additional tutoring or remedial classes, saving students both time & money.
- It is ~ 240 times cost effective for an institution rather than hiring a full-time teaching assistants.

Constructive Use of Generative AI:

- Uses cutting-edge GenAI technology to motivate students to leverage it constructively, and minimize passive learning or plagiarism.
- Enhances the learning experience for students by offering tailored guidance.
- The “Restricted Attempts” feature limits their use of GenAI & encourages thinking toward the solution using personalized hints.

FUTURE WORK

- Collect datasets of existing coding assignments to fine-tune the GPT model
- Access generated results from Firestore directly in the App.
- Scalable platform for testing in a class of 30 students