Chatbot for Math Homework Support

Course Subject:	Calculus for Life Sciences
Student Level:	Undergraduate (mostly first and second year)
Number of Students:	40 – 50 per section
Developed by:	**Instructor** [Abby Williams](#), Assistant Teaching Professor, College of Science **Programming / Bot Development** Nik Bear Brown, Associate Teaching Professor, College of Engineering Dev Shah, Graduate Student, Computer Science and Engineering

What Students Did

Students have used a chatbot running on ChatGPT (nicknamed "Ada") to get step-by-step instructions for solving a homework problem when they are stuck. The textbook provides one correct answer, even when there are multiple ways of writing that answer. So, students could have a correct answer that differs from the answer shown in the textbook. The chatbot allows them to check their answers as well as their problem solving processes. They can enter the problem into ChatGPT by typing

it or by uploading a picture of it. Students have also used the chatbot to generate practice problems for the mid-term and final exams.

Every week, students take quizzes based on homework questions. The quizzes are handwritten, and they have to do the homework in order to do well on the quizzes.

Purpose

The purpose of the chatbot is to give students 24/7 access to help with solving homework problems and guidance for preparing for exams.

Assessment

Students were given a survey where they were asked to assess Ada's usefulness and provide feedback about any criticisms they might have. Their opinions were overall positive. Students valued having an on-demand study tool to help them when they get stuck on homework problems. Several students also mentioned that they appreciated being encouraged and assisted in using AI to help learn.

The survey responses below illustrate how students used Ada and how they found it helpful.

- *"I really like that Ada can go step-by-step through a homework problem and answer more specific questions about each part. I really like that I can input a screenshot of the problem and she can recognize it."*
- *"I liked that we were encouraged and given the platform to use AI in an ethical and developmental way. It's a really cool concept to have a bot that is directly tailored to our class and won't be confused or give us any incorrect answers! Ada is certainly a big help."*
- *"I like that it can explain the same topic in a variety of ways. It could give me just the formulas used, step by step processes, examples, or quick one-sentence summaries. For example, after explaining what Rieman sums are, I could ask it to explain that to me "in simple terms."*
- *"I love that you support the use of AI as a tool. Some professors view these programs as strictly negative, but the reality is that they are amazing out-of-the-classroom tools, and I appreciate your encouragement to take advantage of the resources out there."*

- *"I like that Ada can go through anything, whether it be a purely conceptual question or a specific example question from our notes. It's also very convenient that you can just ask for clarification on any specific unit (11.1, for instance) and Ada will know what that is and be able to follow our lesson plans."*

Faculty Reflections

I think Ada has been a success so far. Students have provided some valuable feedback which I hope to incorporate into future iterations of Ada. Most of the criticisms are more related to the restrictions of the free ChatGPT accounts that they all used. The majority of students have reported that they feel Ada has helped them understand the material from class and helped with their homework. Next semester I plan on introducing Ada much earlier. Having a class specific chat bot has been really beneficial to my students.

Step-by-Step Directions

Step 1	Click the link to the [Ada Chatbot]().
Step 2	When the chatbot opens, log into your ChatGPT account (a free account works).
Step 3	Type your question or upload a picture to generate a response, including graphs as applicable.