

# Code Soliloquies to make your LLM a better Math tutor

1. Visit our poster to learn how to make LLMs effective tutoring agents for subjects like math and physics
2. But, how can one trust LLMs for math tutoring?
3. When, GPT-4 is 59% accurate for 3-digit by 3-digit multiplication
4. Solution: LLMs are excellent at coding
5. LLMs engage in Code Soliloquy
  - a. Decide if their next student response necessitate a calculation
  - b. Code that calculation
6. Scan the QR code to find out more



## CLASS meets Code Soliloquy



Please help me with this question: What is the force on a 50 kg body accelerating at 10 m/s<sup>2</sup>?

Deciding state

**Prompt: Does a response to the student require calculations?**  
No.

No Python state

**Prompt: Respond to the student.**  
Try using  $f=ma$ . Using the formula, plug in the values for mass and acceleration to get force.



**Prompt: Respond as a high school student.**  
Is it 500?

Student state

Deciding state

**Prompt: Does a response to the student require calculations?**  
Yes. Code description: Validate the student's answer of 500 N by using the formula  $f=ma$  with a mass of 50 kg and acceleration of 10 m/s.

Use Python state

**Prompt: Write code based on the given description.**

```
python
student_force = 500
mass = 50
acceleration = 10
actual_force = mass * acceleration
is_correct = math.isclose(student_force,
actual_force, rel_tol=0.01)
```

Execute Python

**Python output:**  
actual\_force = 500, is\_correct = True

Received Python state

**Prompt: Respond to the student using the Python output.**  
Yes, that's correct! The force is in fact 500 N. Don't forget the units - good job!

