PyTutor

Small Language Model Python Tutor

Objectives

- Supplement student learning
- **3 Modules**: Chatbot, Lessons, Quizzes
- Low resource requirements
- **Customizability**
- **Integration** with CSC1015 course
- **Implement** Pedagogical Guardrails

Chatbot

What does the chatbot do ?

PyTutor is a Socratic Python tutor for CSC1015 students, powered by a highly efficient Phi-3.5 Small Language Model. Rather than acting as a standard AI that writes code for you, it has been specially trained using LoRA to only provide hints and guiding questions. It runs entirely locally on standard student hardware for fast accessible help, with a built in prompt injection guard.

+ Message PyTutor

Microsoft Phi 3.5

Driven by a lightweight Small Language Model designed to run locally on consumer hardware.

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LoRA Adapter

Powered by module-specific LoRA adapters, fine-tuned via SFT for precision and efficiency.

Weekly Lessons

Version 3 ∨ | Generate new lesson

- Provides **detailed notes** on weekly lessons.
- Based on **CSC1015 curriculum**.
- **Unique** to each user.
- **Coding exercises** based on test content.

Quizzes

Format: MCQ | Bloom's: Remember | 67 XP

Q1: What features does this quiz generation module provide?

A Generate targeted quizzes across all CSC1015 topics

B Select cognitive difficulty using Bloom's Revised Taxonomy

C Personalize questions around your own hobbies and interests

D Generate questions across 7 distinct assessment formats

E All of the above ✓ Correct

Score: 1/1 | Next Question →

Results

- 100% Code requests withheld (n = 20)
- 95.4% Schema compliance for questions generated
- Ease of Use: **4.2** out of 5 from 13 users
- **2.8GB RAM** to run on student laptop

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