LLM Best Practises

ODSC Conference: Module 2

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Agenda

- Top Tricks from LLM Research
- [Case Study] Implementing these ideas
- Understanding Agents and AI Landscape
- [Hands-on] Creating LLM Apps and AI Agent Apps

Quiz!

https://tinyurl.com/ODSCLLMQ2

Building blocks of LLMs

Why Large?

- Large Training Dataset: Trained on massive datasets
- Large Architectures : Billions of parameters
- Large Computing Power: Requires massive GPUs

01

Foundation

Enormous amount of text data trained in an autoregressive manner

02

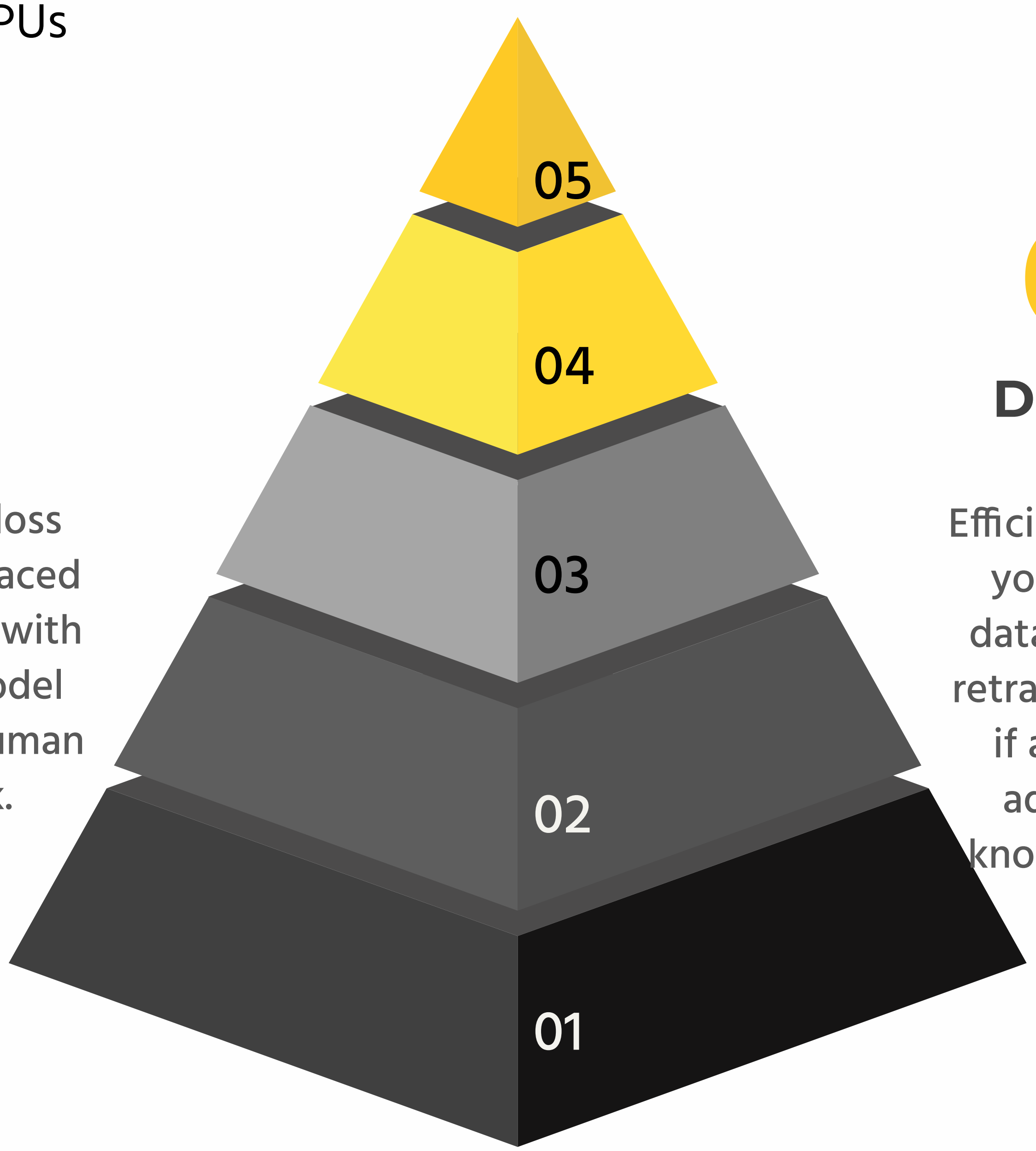
Fine-tuning

Supervised fine-tuning on appropriate and well curated datasets to teach desired output behaviour.

03

RLHF

Next token loss function replaced or combined with a reward model trained on Human Feedback.



04

Database

Efficiently leverage your company data. No need to retrain your model if a new pdf is added to the knowledge base.

05

Memory

LLMs can have a huge context length and keep previous questions/tasks in memory for superior context understanding.

LIMA: Less is More Alignment

- 1,000 carefully curated prompts and examples
- LLaMA-1 was fine-tuned on these to outperform all other models
- Note: 65B model was used

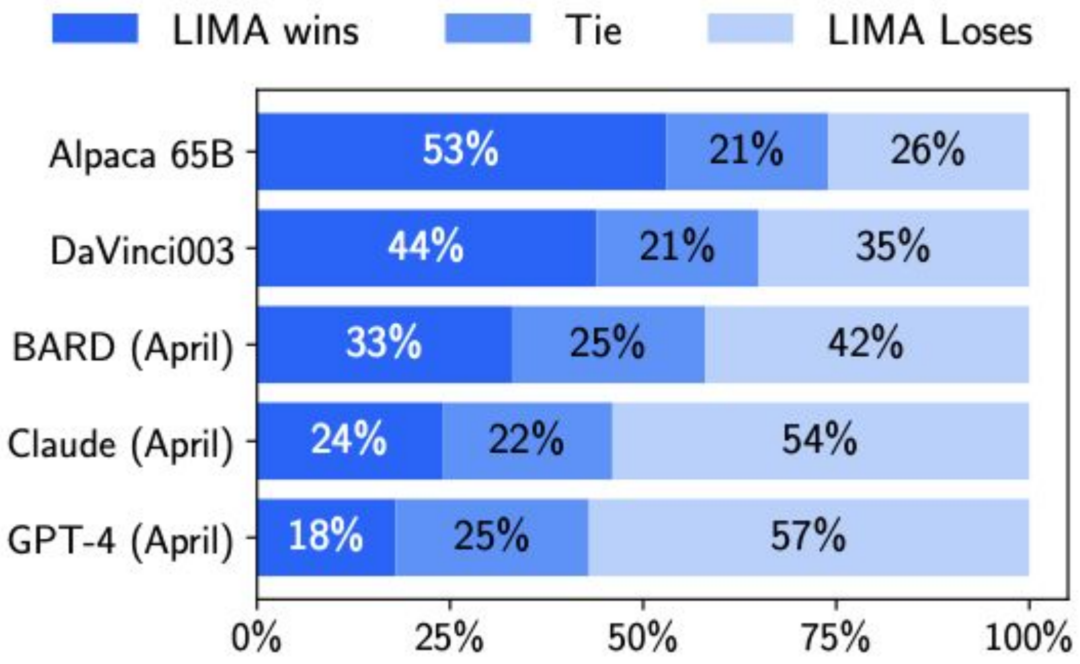


Figure 1: Human preference evaluation, comparing LIMA to 5 different baselines across 300 test prompts.

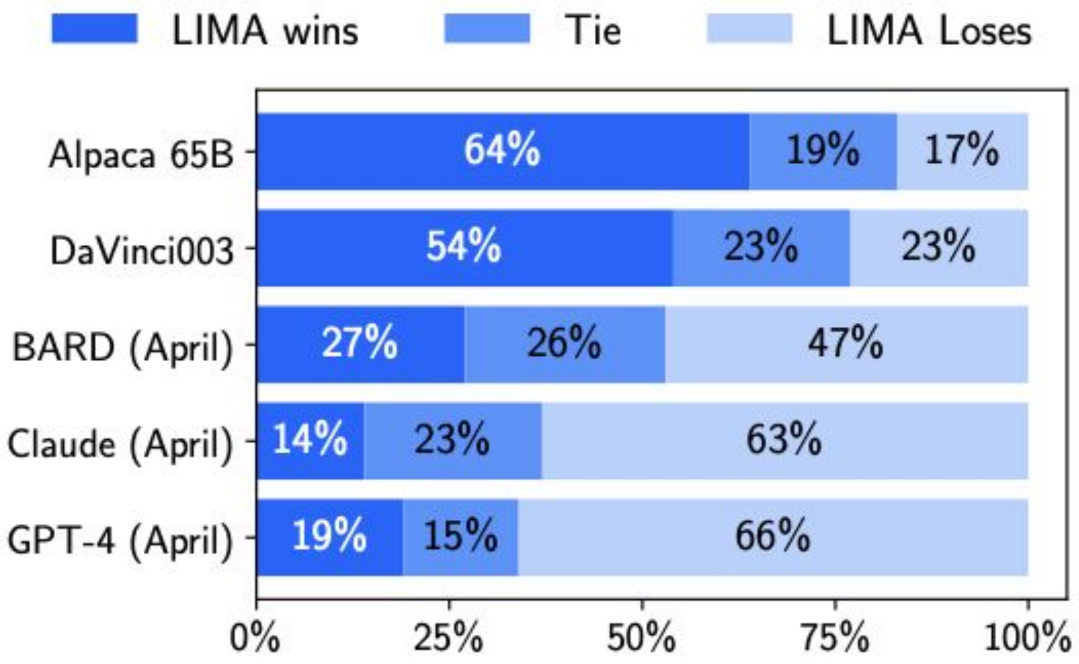
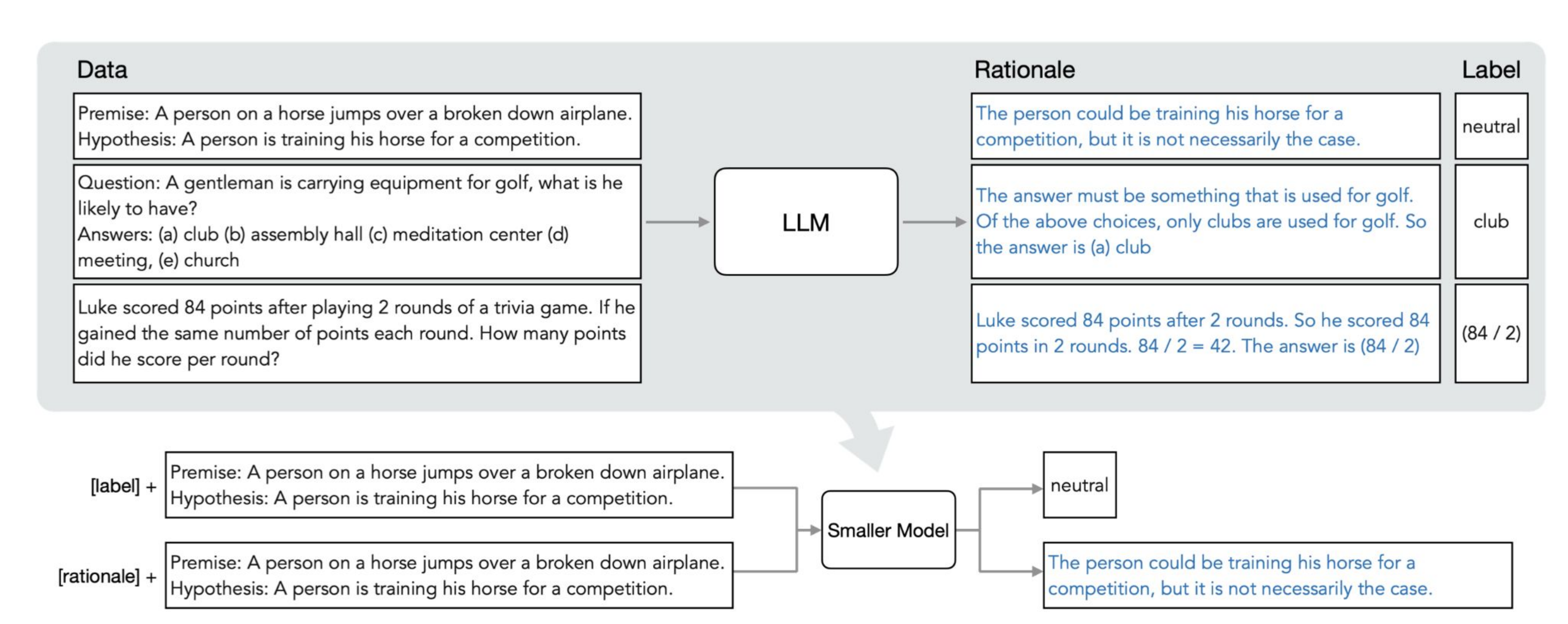


Figure 2: Preference evaluation using GPT-4 as the annotator, given the same instructions provided to humans.

Distil: Step by Step

- Outperform 2000x Larger Models
- CoT to give logic to outputs and high quality tokens
- Outperforms both fine-tuned and distilled models



Premise: A person on a horse jumps over a broken down airplane. Hypothesis: A person is training his horse for a competition.

Question: A gentleman is carrying equipment for golf, what is he likely to have? Answers: (a) club (b) assembly hall (c) meditation center (d) meeting, (e) church

Luke scored 84 points after playing 2 rounds of a trivia game. If he gained the same number of points each round. How many points did he score per round?

The person could be training his horse for a competition, but it is not necessarily the case.

neutral

The answer must be something that is used for golf. Of the above choices, only clubs are used for golf. So the answer is (a) club

club

Luke scored 84 points after 2 rounds. So he scored 84 points in 2 rounds. 84 / 2 = 42. The answer is (84 / 2)

(84 / 2)

[label] + Premise: A person on a horse jumps over a broken down airplane. Hypothesis: A person is training his horse for a competition.

[rationale] + Premise: A person on a horse jumps over a broken down airplane. Hypothesis: A person is training his horse for a competition.

neutral

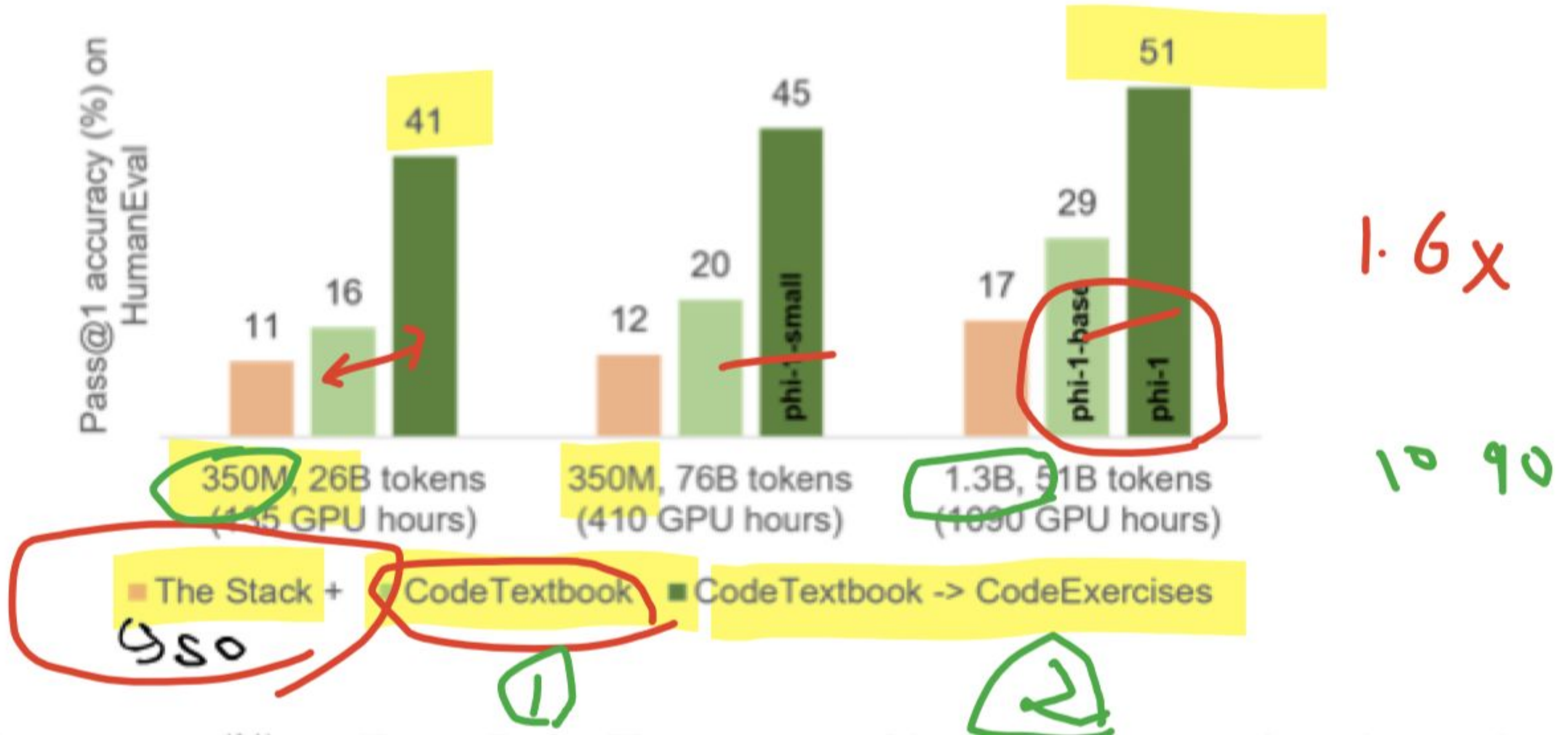
The person could be training his horse for a competition, but it is not necessarily the case.

Instruction BackTranslation

- Pseudo Labelling: Using Model to label data and perform SSL
- LLMs require to be converted to a “chatbot” where they are fine-tuned with chats
- This needs question-answer pairs
- We perform “backtranslation”: LLaMA is used to create Qs from answers
- 3200 answers are enough to outperform everything else

Textbooks are all you Need

- Smallest Model to generate Python Code
- Key: First Train on Task
- Later: Fine-Tune to questions
- The above step causes Emergent Abilities



Quiz!

https://tinyurl.com/ODSCLLMQ3

Demo in Practise

Case Study: Simulacra Paper

Hands-on: Implementing AI Agents

Thank You