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Week 8 : Assignment 8

The due date for submitting this assignment has passed.

Due on 2025-03-19, 23:59 IST.

Assignment submitted on 2025-03-13, 14:46 IST

1) Which factors influence the effectiveness of instruction tuning? ***1 point***

- [x] The number of instruction templates used in training.
- [ ] The tokenization algorithm used by the model.
- [x] The diversity of tasks in the fine-tuning dataset.
- [x] The order in which tasks are presented during fine-tuning.

Yes, the answer is correct.
Score: 1

Accepted Answers:
The number of instruction templates used in training.
The diversity of tasks in the fine-tuning dataset.
The order in which tasks are presented during fine-tuning.

2) What are key challenges of soft prompts in prompt-based learning? ***1 point***

- [ ] Forward pass with them is computationally inefficient compared to that with hard prompts.
- [x] They require additional training, unlike discrete prompts.
- [x] They cannot be interpreted or used effectively by non-expert users.
- [ ] They require specialized architectures that differ from standard transformers.

Yes, the answer is correct.
Score: 1

Accepted Answers:
They require additional training, unlike discrete prompts.
They cannot be interpreted or used effectively by non-expert users.

3) Which statement best describes the impact of fine-tuning versus prompting in LLMs? ***1 point***

- ( ) Fine-tuning is always superior to prompting in generalization tasks.
- ( ) Prompting requires gradient updates, while fine-tuning does not.
- (•) Fine-tuning modifies the model weights permanently, while prompting does not.
- ( ) Prompting performs better on in-domain tasks compared to fine-tuning.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Fine-tuning modifies the model weights permanently, while prompting does not.

4) Which of the following aspects of the model outputs are captured by POSIX? ***1 point***

- [x] Diversity in the responses to intent-preserving prompt variations
- [ ] Entropy of the distribution of response frequencies
- [ ] Time required to generate responses for intent-preserving prompt variations
- [x] Variance in the log-likelihood of the same response for different input prompt variations

Partially Correct.
Score: 0.67

Accepted Answers:
Diversity in the responses to intent-preserving prompt variations
Entropy of the distribution of response frequencies
Variance in the log-likelihood of the same response for different input prompt variations

5) Which key mechanism makes Tree-of-Thought (ToT) prompting more effective than Chain-of-Thought (CoT)? ***1 point***

- ( ) ToT uses reinforcement learning for better generalization.
- (•) ToT allows backtracking to explore multiple reasoning paths.
- ( ) ToT reduces hallucination by using domain-specific heuristics.
- ( ) ToT eliminates the need for manual prompt engineering.

Yes, the answer is correct.
Score: 1

Accepted Answers:
ToT allows backtracking to explore multiple reasoning paths.

6) What is a key limitation of measuring accuracy alone when evaluating LLMs? ***1 point***

- ( ) Accuracy is always correlated with model size.
- ( ) Accuracy cannot be measured on open-ended tasks.
- ( ) Accuracy is independent of the training dataset size.

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Quiz: Week 8 : Assignment 8 (assessment?name=77)

Week 9 ()

Week 10 ()

Week 11 ()

Week 12 ()

Year 2025 Solutions ()

- (selected) Accuracy does not account for prompt sensitivity.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Accuracy does not account for prompt sensitivity.

7) Why is instruction tuning not sufficient for aligning large language models? ***1 point***

- It does not generalize to unseen tasks.
- (selected) It cannot prevent models from generating undesired responses.
- It reduces model performance on downstream tasks.
- It makes models less capable of learning from new data.

Yes, the answer is correct.
Score: 1

Accepted Answers:
It cannot prevent models from generating undesired responses.

8) Why is KL divergence minimized in regularized reward maximization? ***1 point***

- To maximize the probability of generating high-reward responses.
- To make training more computationally efficient.
- To prevent the amplification of bias in training data.
- (selected) To ensure models do not diverge too far from the reference model.

Yes, the answer is correct.
Score: 1

Accepted Answers:
To ensure models do not diverge too far from the reference model.

9) What is the primary advantage of using the log-derivative trick in REINFORCE? ***1 point***

- Reducing data requirements
- Expanding the token vocabulary
- (selected) Simplifying gradient computation
- Improving sampling diversity

Yes, the answer is correct.
Score: 1

Accepted Answers:
Simplifying gradient computation

10) Which method combines reward maximization and minimizing KL divergence? ***1 point***

- REINFORCE
- Monte Carlo Approximation
- (selected) Proximal Policy Optimization
- Constitutional AI

Yes, the answer is correct.
Score: 1

Accepted Answers:
Proximal Policy Optimization