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NPTEL (https://swayam.gov.in/explorer?ncCode=NPTEL) » Introduction to Large Language Models (LLMs)  
(course)

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Course  
outline

About NPTEL  
( )

How does an  
NPTEL online  
course work?  
( )

Week 1 ( )

Week 2 ( )

Week 3 ( )

Week 4 ( )

Week 5 ( )

Week 6 ( )

Week 7 ( )

Week 8 ( )

Week 8 : Assignment 8

The due date for submitting this assignment has passed.

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

Assignment submitted on 2025-03-17, 22:30 IST

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

- ☒ The number of instruction templates used in training.
- ☐ The tokenization algorithm used by the model.
- ☒ The diversity of tasks in the fine-tuning dataset.
- ☒ 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.
- ☒ They require additional training, unlike discrete prompts.
- ☒ They cannot be interpreted or used effectively by non-expert users.
- ☐ They require specialized architectures that differ from standard transformers.

No, the answer is incorrect.  
Score: 0

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.

● Lec 21 :  
Instruction  
Tuning (unit?  
unit=70&lesson  
=71)

● Lec 22 :  
Prompt-based  
Learning (unit?  
unit=70&lesson  
=72)

● Lec 23 :  
Advanced  
Prompting and  
Prompt  
Sensitivity  
(unit?  
unit=70&lesson  
=73)

● Lec 24 :  
Alignment of  
Language  
Models-I (unit?  
unit=70&lesson  
=74)

● Lec 25 :  
Alignment of  
Language  
Models-II (unit?  
unit=70&lesson  
=75)

● Lecture Material  
(unit?  
unit=70&lesson  
=82)

● Feedback Form  
(unit?  
unit=70&lesson  
=76)

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

Week 9 ()

Week 10 ()

Week 11 ()

Week 12 ()

Year 2025  
Solutions ()

☐ 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**

- ☐ 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
- ☒ 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.
- ☐ Accuracy does not account for prompt sensitivity.

No, the answer is incorrect.

Score: 0

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.
- ☐ 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.

No, the answer is incorrect.

Score: 0

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.
- ☒ 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
- ☒ 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
- ☒ Proximal Policy Optimization
- ☐ Constitutional AI

Yes, the answer is correct.

Score: 1

Accepted Answers:

*Proximal Policy Optimization*