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OER 4.2.2

Applying Chain-of-Thought Techniques to Display Intermediate Logical Steps

Identifier	OER 4.2.2
Title	Applying Chain-of-Thought Techniques to Display Intermediate Logical Steps
Creator	Rhodes Evening High School - Greece
Description	The resource addresses the techniques that make the machine externalise the intermediate steps of its reasoning: Chain-of-Thought, self-consistency and tree-of-thought. It shows how step-by-step prompts can be used pedagogically as a model of procedure and how to probe multiple reasoning paths. The critical focus is that a fluent chain of thought is not a proof of the correctness of the result.
Keywords	chain-of-thought; step-by-step prompting; self-consistency; tree of thought; reasoning; procedural modelling; prompt engineering; critical evaluation
Language	EN (English)
Affiliation	Rhodes Evening High School - Greece
Contributor	STIAEM Transnational Scientific Board (peer review, Rhodes validation protocol)
Media Format	Text; Infographics
Genre	Training Manual; Educational Guide
URL	https://www.stiaemproject.eu/?oer_download=OER-4.2.2
Citation	Rhodes Evening High School. (2026). *Applying Chain-of-Thought Techniques to Display Intermediate Logical Steps* [Educational guide]. Slow Tech Innovation: AI, Ethics, and New Teaching Methods (STIAEM), 2025-1-IT02-KA220-SCH-000365213.
References	Cosgrove, J., & Cachia, R. (2025). DigComp 3.0: European digital competence framework (Fifth edition). Publications Office of the European Union. https://data.europa.eu/doi/10.2760/0001149 Kojima, T., Gu, S. S., Reid, M., Matsuo, Y., & Iwasawa, Y. (2022). Large language models are zero-shot reasoners. Advances in Neural Information Processing Systems, 35. https://arxiv.org/abs/2205.11916 Miao, F., & Cukurova, M. (2024). AI competency framework for teachers. UNESCO. https://doi.org/10.54675/ZJTE2084 Wang, X., Wei, J., Schuurmans, D., Le, Q., Chi, E., Narang, S., Chowdhery, A., & Zhou, D. (2022). Self-consistency improves chain of thought reasoning in language models. International Conference on Learning Representations (ICLR). https://arxiv.org/abs/2203.11171 Wei, J., Wang, X., Schuurmans, D., Bosma, M., Ichter, B., Xia, F., Chi, E., Le, Q., & Zhou, D. (2022). Chain-of-thought prompting elicits reasoning in large language models. Advances in Neural Information Processing Systems, 35. https://arxiv.org/abs/2201.11903 Yao, S., Yu, D., Zhao, J., Shafran, I., Griffiths, T. L., Cao, Y., & Narasimhan, K. (2023). Tree of thoughts: Deliberate problem solving with large language models. Advances in Neural Information

	Processing Systems, 36. https://arxiv.org/abs/2305.10601
Educational Level	Secondary School
Associated Module / MOOC Video Lesson	Module 4 - Prompt Engineering for Inclusive Education / Video 4.2 - Advanced Prompting and Chain-of-Thought
Learning Objectives	Explain what Chain-of-Thought techniques are and why they bring out the intermediate steps of reasoning; use step-by-step reasoning prompts and evaluate their didactic usefulness as a model of procedure; reflect critically on the fact that a fluent chain of thought is not a proof of the truth of the result.
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