The Sapientia ECN AI Baseline Index: Comparing LLMs to Student Performance in Competitive Programming

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We present the Sapientia ECN AI Baseline Index, a benchmark designed to evaluate the core problem-solving abilities of publicly available, state-of-the-art Large Language Models (LLMs) in competitive programming. Leveraging basic prompting techniques on challenges from the annual Sapientia Efficiency Challenge Networking (ECN) competition, we assess LLMs' baseline performance while intentionally excluding advanced enhancements such as agentic systems or external knowledge retrieval. Our study compares LLM-generated solutions with those of student teams from the ECN 2023 and 2024 competitions, analyzing both the quantity and nature of problems solved, along with score distributions. By establishing a consistent, longitudinal measure, the ECN AI Baseline Index aims to monitor AI capability progression in complex problem-solving and provide insights into how LLMs compare to top-performing and median-level student expertise.