## **DepsRAG**: Towards Agentic Reasoning and Planning for Software Dependency Management

### Contribution

We introduce **DepsRAG**, the first multi-agent, LLMbased framework for managing and reasoning about software dependencies.

#### Motivation: Software Dependency Reasoning

Reasoning about software dependency is a daunting which requires extensive experience and task, accumulated knowledge in different domains. Therefore, it is challenging to answer the following question.

For Chainlit, PyPI, version 1.1.200, which packages have the most dependencies relying on them (i.e., which nodes have the highest in-degree in the graph), and what is the risk associated with a vulnerability in those packages?





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# DepsRAG Architecture





#### Evaluation

Software Dependency Data source: Google Deps.Dev API **Tasks:** We provided DepsRAG with three multi-step tasks (T1-T3) and manually verified DepsRAG's final answers. LLMs: GPT-4-Turbo & Llama-3

Ablation results show the correctness of the answers with and without Agent-Critic interaction