Oracle SQLcl MCP server evaluation and resource limits

CERN openlab Summer Student Programme Lightning talks

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18/08/2026

Motivation

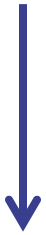
Problem description

We have a database of bike rentals at CERN, and we want to see who is likely to return their bike soon due to the end of their contract.

Motivation

Problem description

SQL



```
SELECT e.name, e.surname, e. affiliationend
FROM bikes b
LEFT JOIN employees e ON b.login = e.login
WHERE e.affiliationend <= '31-AUG-26'
FETCH FIRST 15 ROWS ONLY
```

Motivation

Problem description

SQL

Results

name	surname	affiliationend
Edwin	Ford	2026-08-21
Anton	Payne	2026-08-23
Max	Roberts	2026-08-30

What if we don‘t know SQL enough?

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If we are unfamiliar with the data model?

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Or if we are just lazy?

What if we don‘t know SQL enough?

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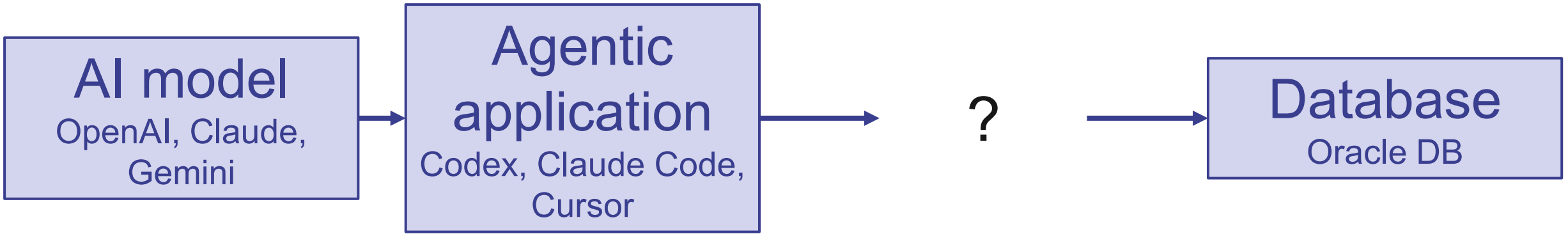
Or if we are just lazy?

AI agents can help us!

The goal

Let users query/modify Oracle DBs data from their LLMs

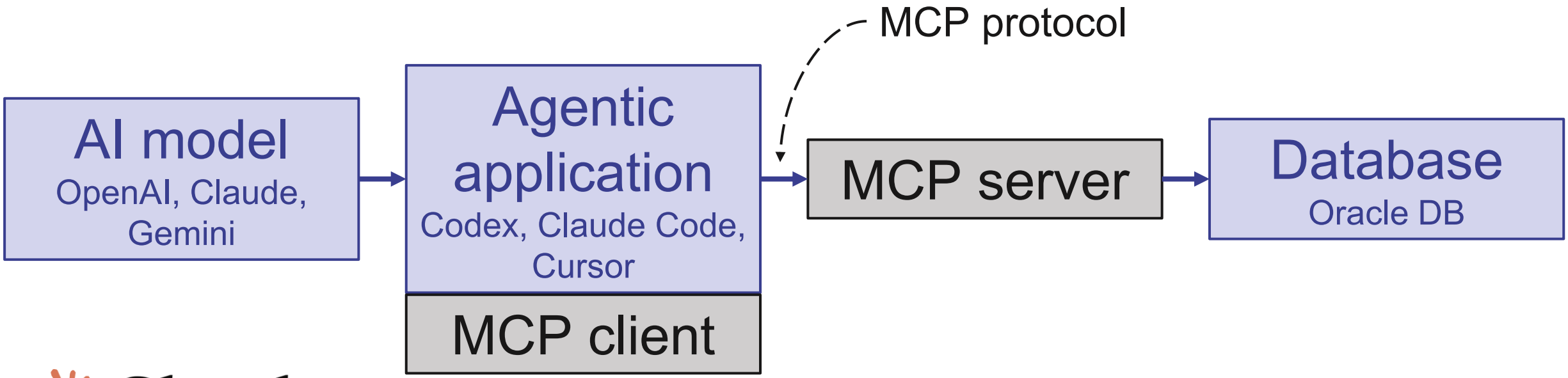
Architecture



Claude

ORACLE

Architecture



Too many options...

MCP server

Self-hosted? OCI? Local?

LLM

Self-hosted? Commercial?

Which specifically?

Performance? Data governance? Scaling? Ease of use?

MCP server deployment

The biggest problem

Authentication and permissions

- **Self-hosted and cloud solutions**: single DB account shared by all users
  - High permission granularity unfeasible
- **Users‘ machine deployment**: inherits user‘s permissions

MCP server deployment

Recommendation

- **Self-hosted** instance **per project or use-case** if needed
  - When all users share the same database privileges
  - Ideally read-only
  - Requires development time to set up
- **Local** (users‘ machine) **deployment** in **all other cases**
  - Flexibility
  - User‘s discretion and responsibility

What about the LLMs?

Let‘s check the benchmarks first

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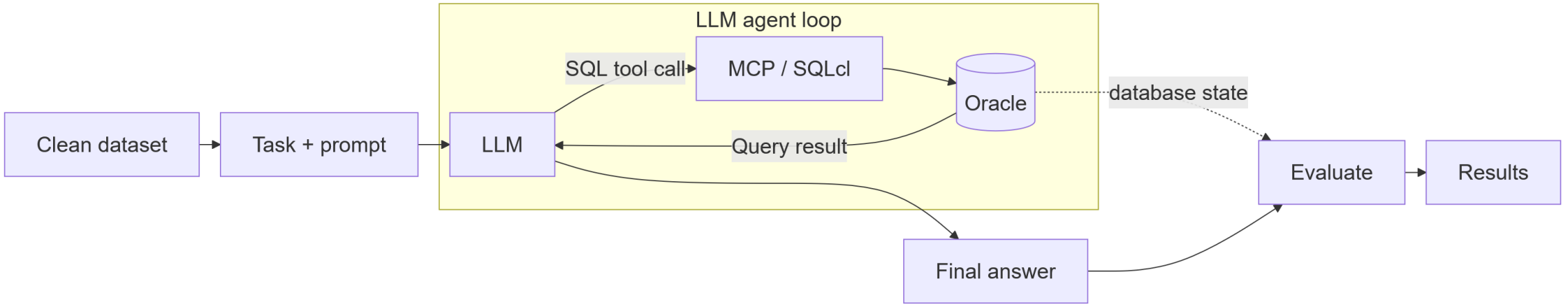
Let‘s check the benchmarks first

... there‘s no benchmark 😑

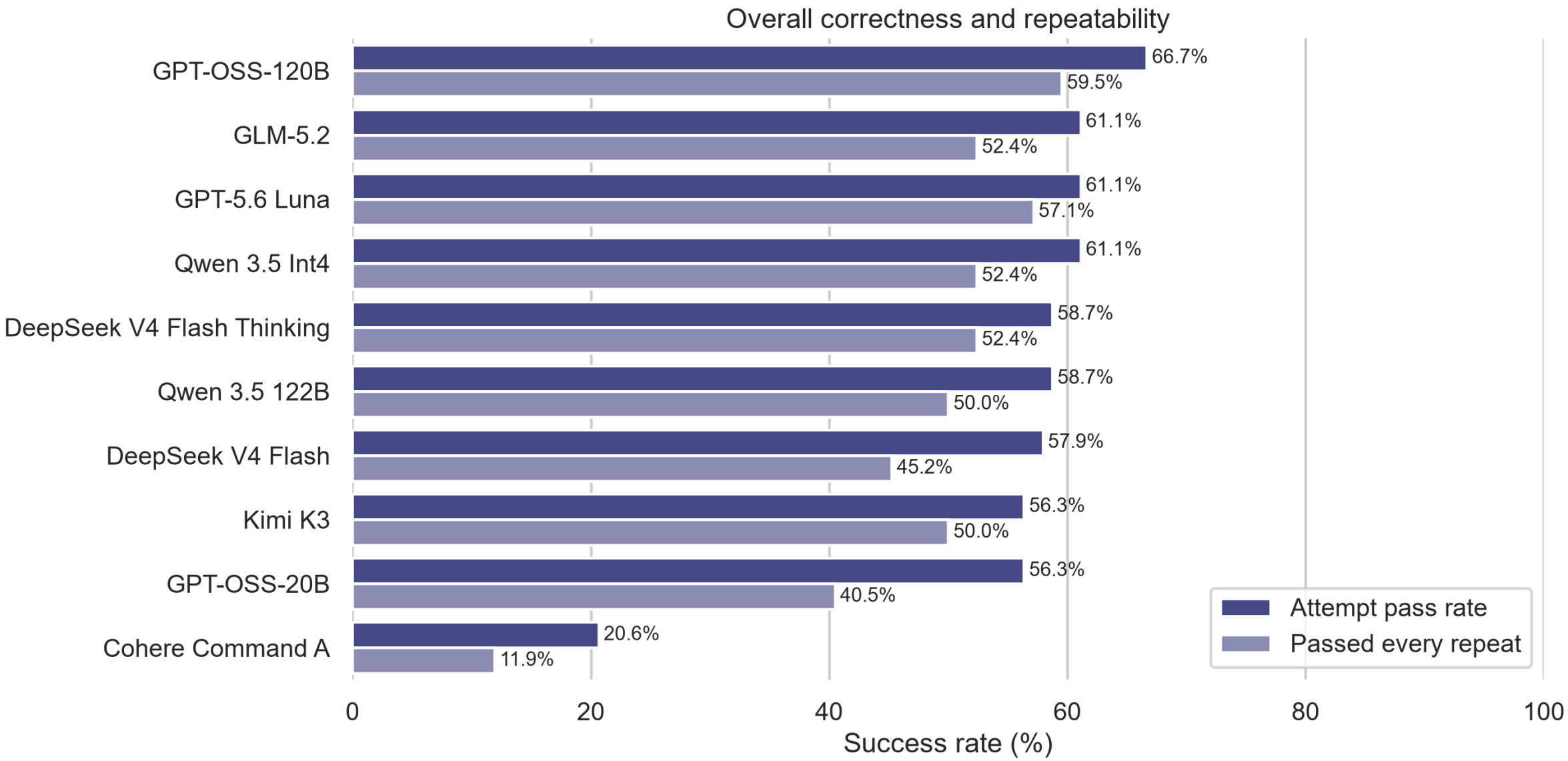
Benchmarking

Oracle-specific text-to-SQL benchmark

- New **benchmarking framework**
- Both **queries and management tasks**
  - Subset of LiveSQLBench Lite datasets + adaptation
- LLM prompted to work directly with the DB (SQLcl)
- 10 models, 3 datasets, 42 tasks, 3 repetitions per task per model



Benchmarking results



Benchmarking conclusions

- Oracle SQL is known well enough
  - Issues with quoting and adherence to the schema – self-recovery
- GPT-OSS-120B is the best general-purpose choice out of these 10 models
- The performance of OCI Cohere A model is very poor
- No model is sufficient for unattended use
- Flagship models remain to be benchmarked

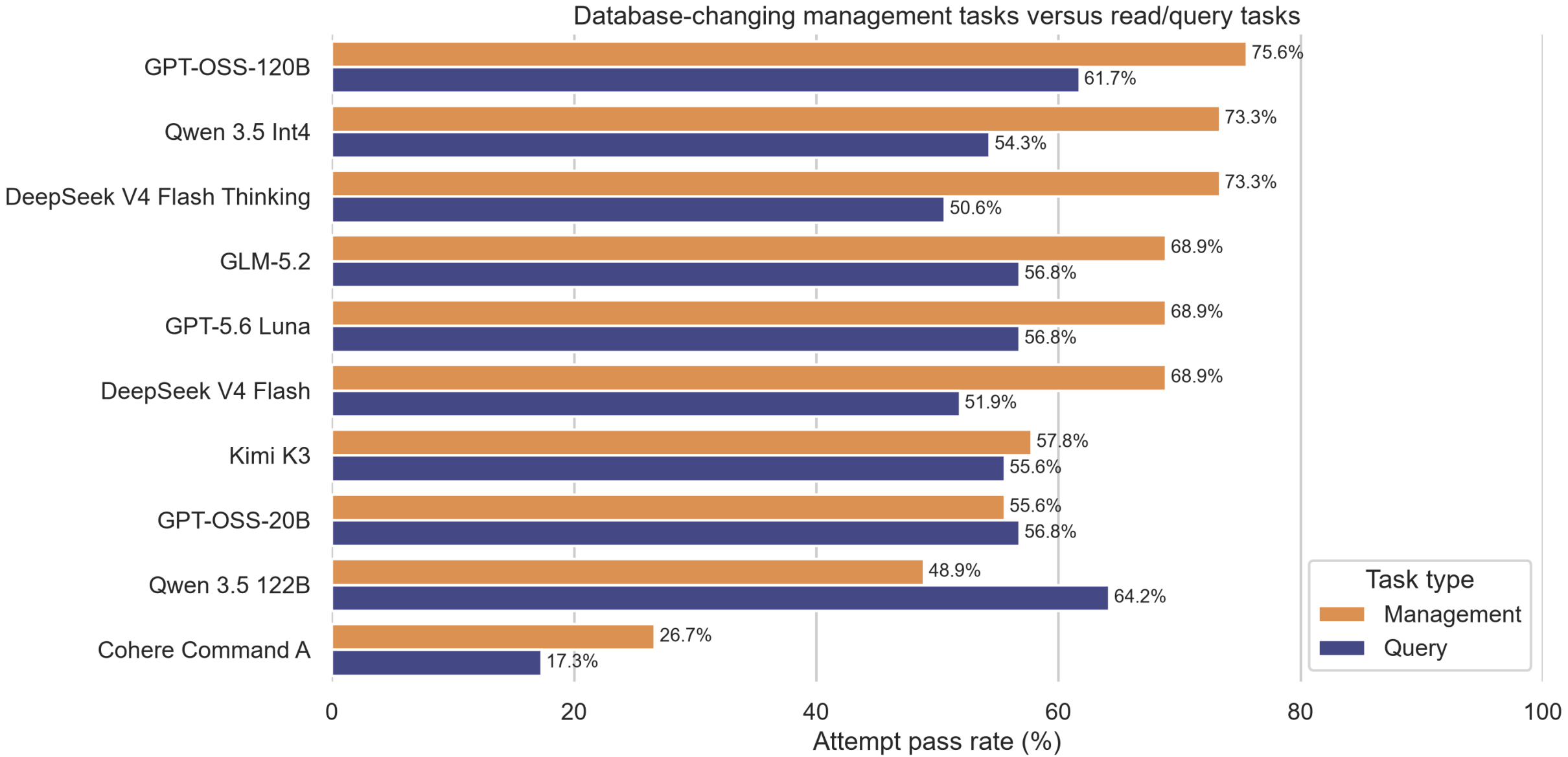
Next steps

Nearly two more weeks to go...

- Implement automatically applied DB **resource limits for database sessions** identified as running an AI/MCP based client

Questions?

Benchmarking results



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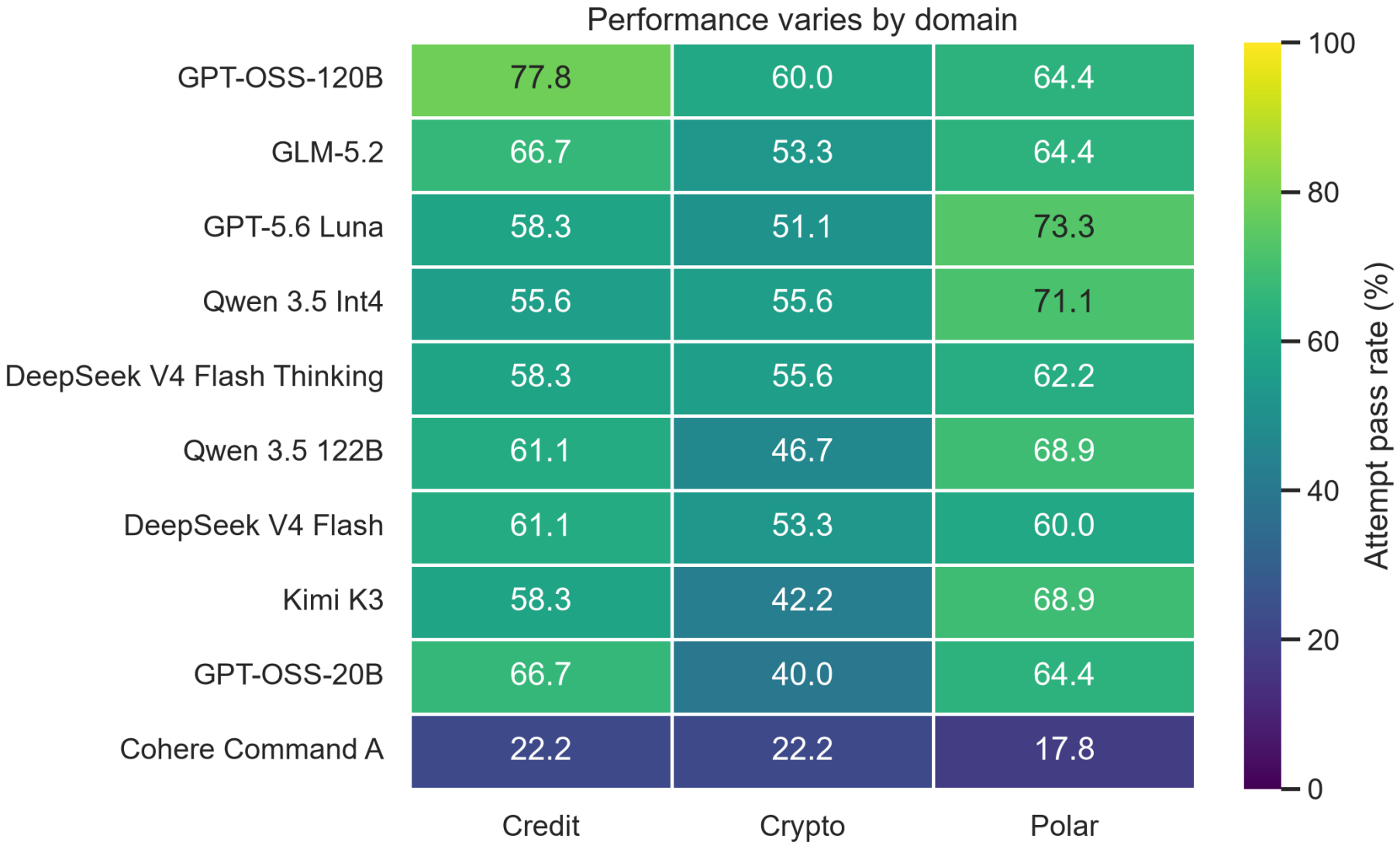

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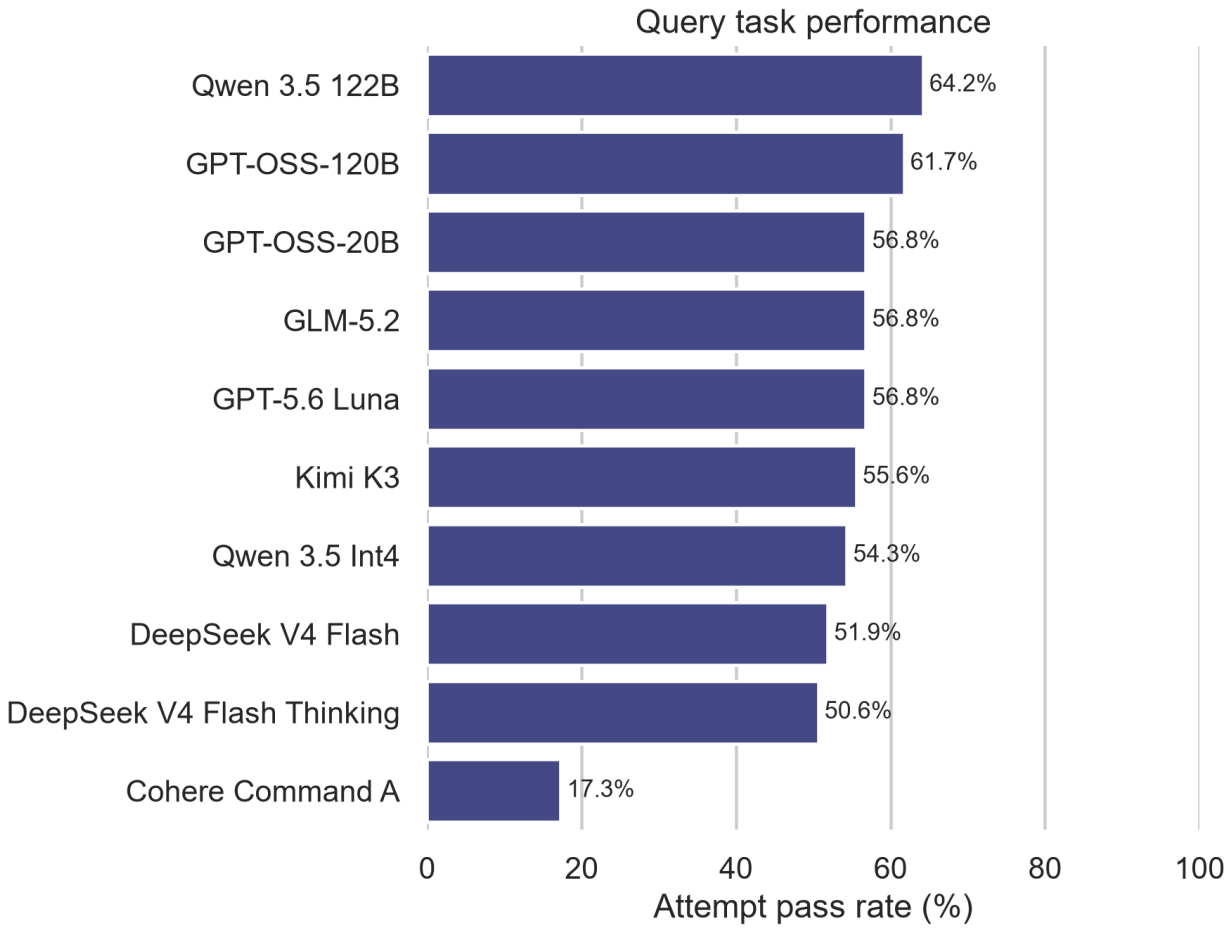

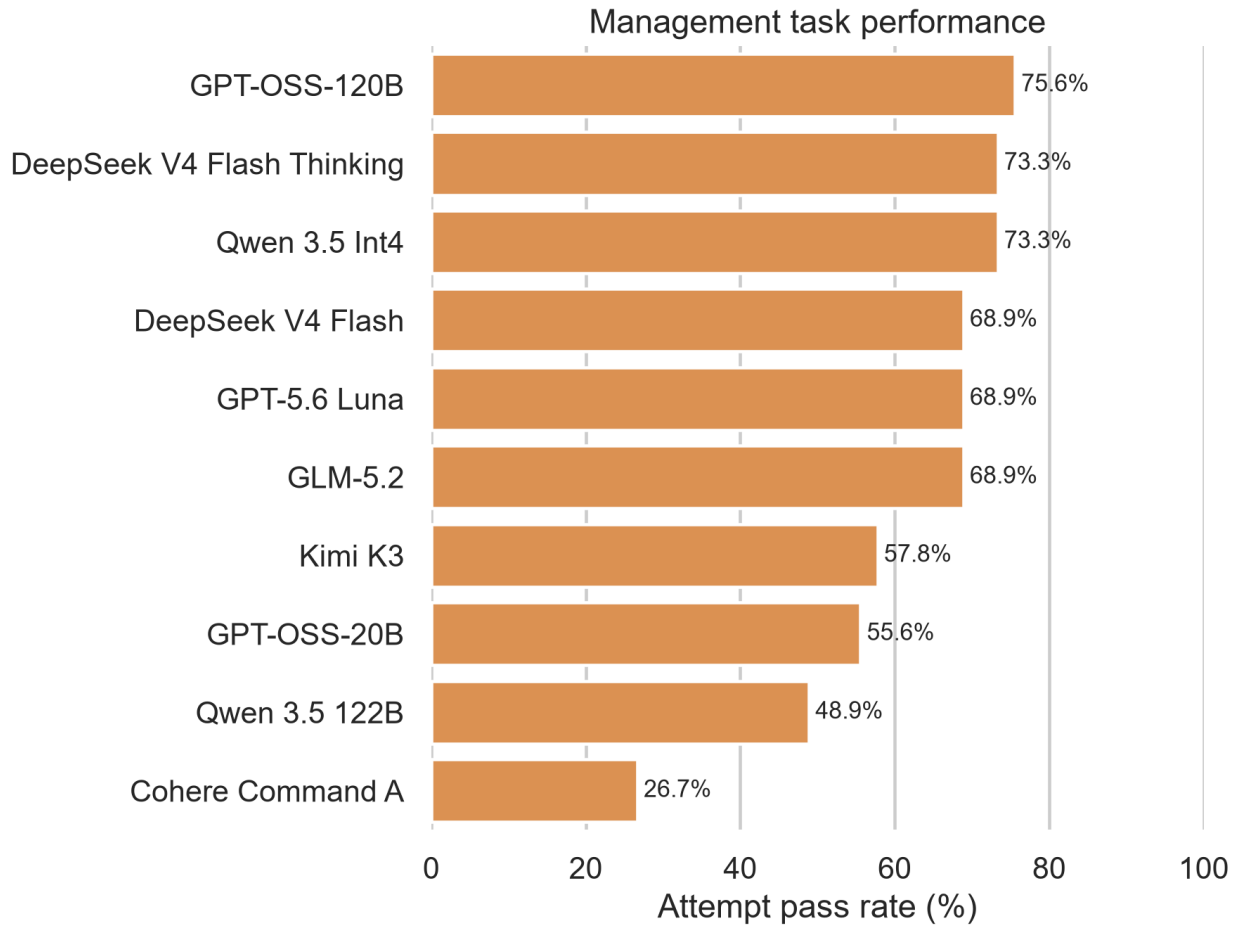

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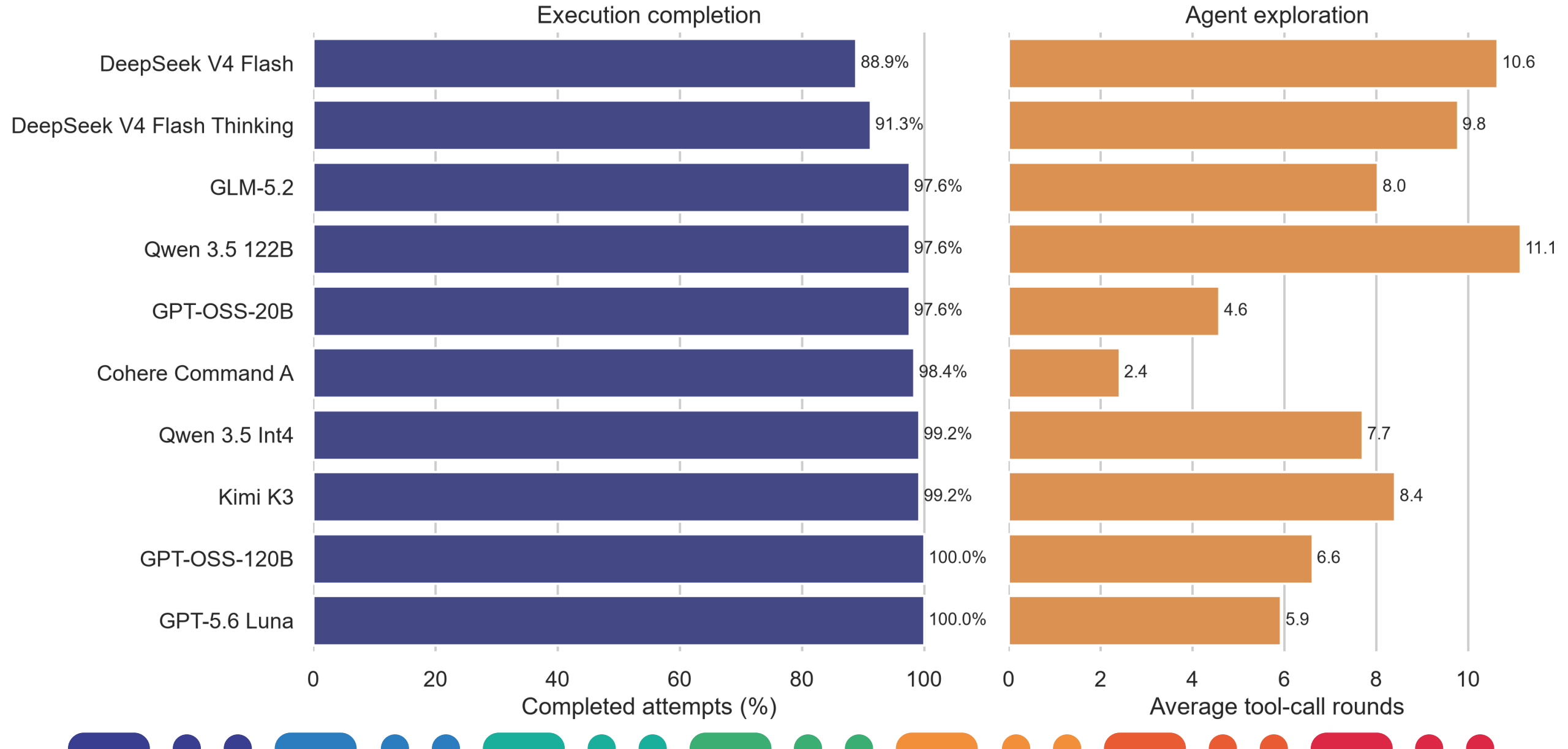
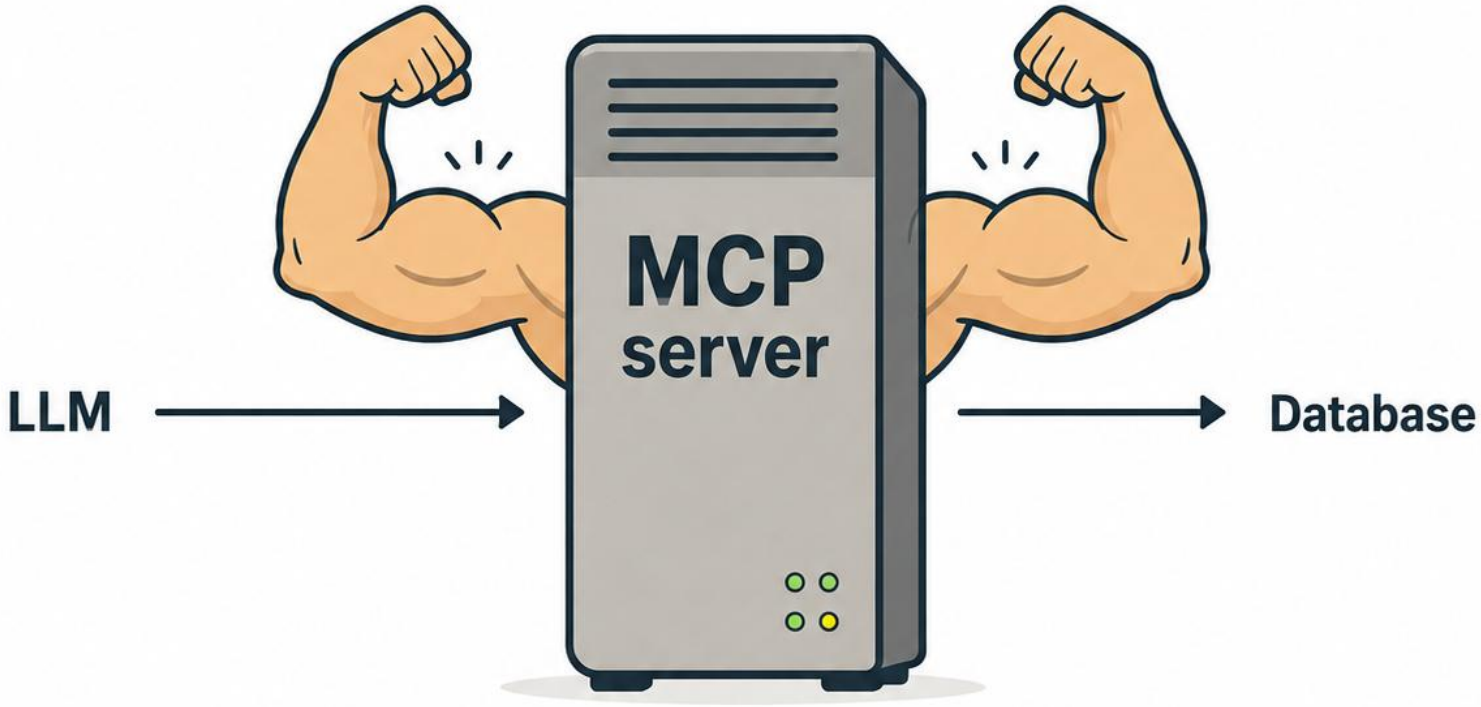


MCP server?



MCP server?