



ELTE

FACULTY OF
INFORMATICS

Practice: Data Science Agents

Run locally

MS Taskweaver

- Open-Source
- Configurable
- Python-kernel is included by default



```
git clone https://github.com/microsoft/TaskWeaver.git
```

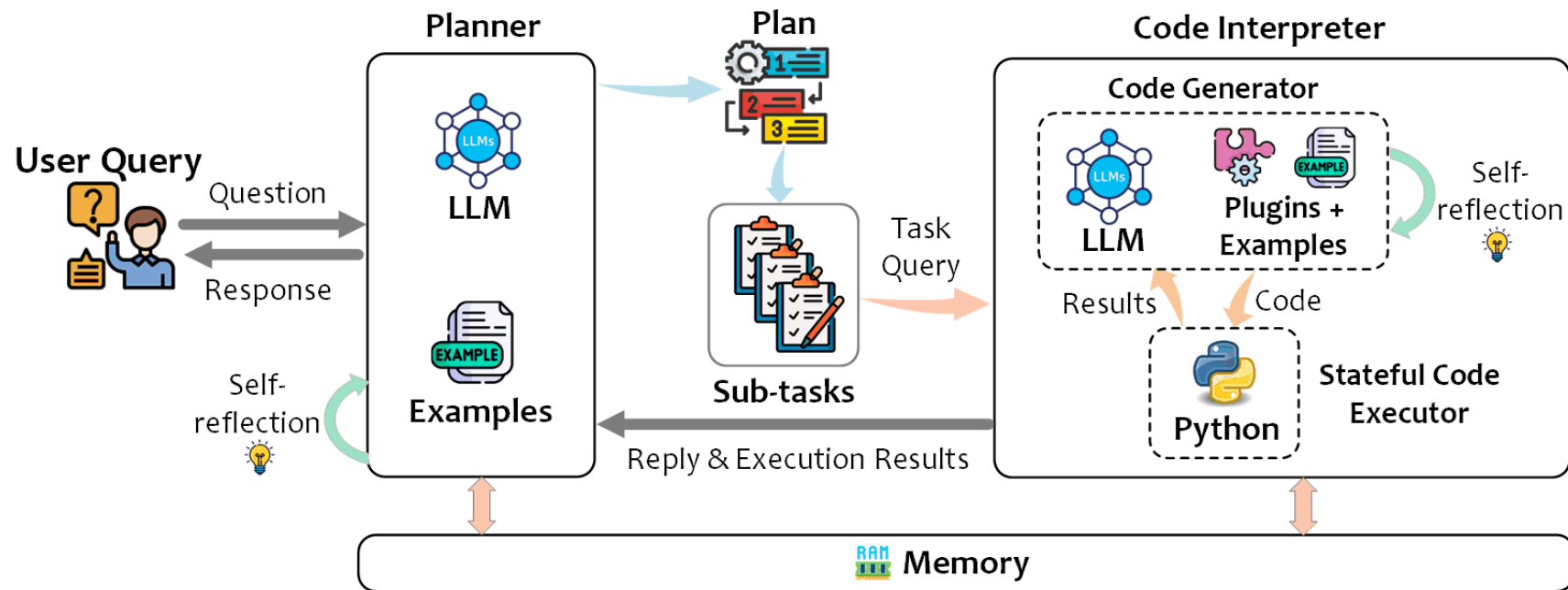
```
cd TaskWeaver
```

```
pip install -r requirements.txt
```



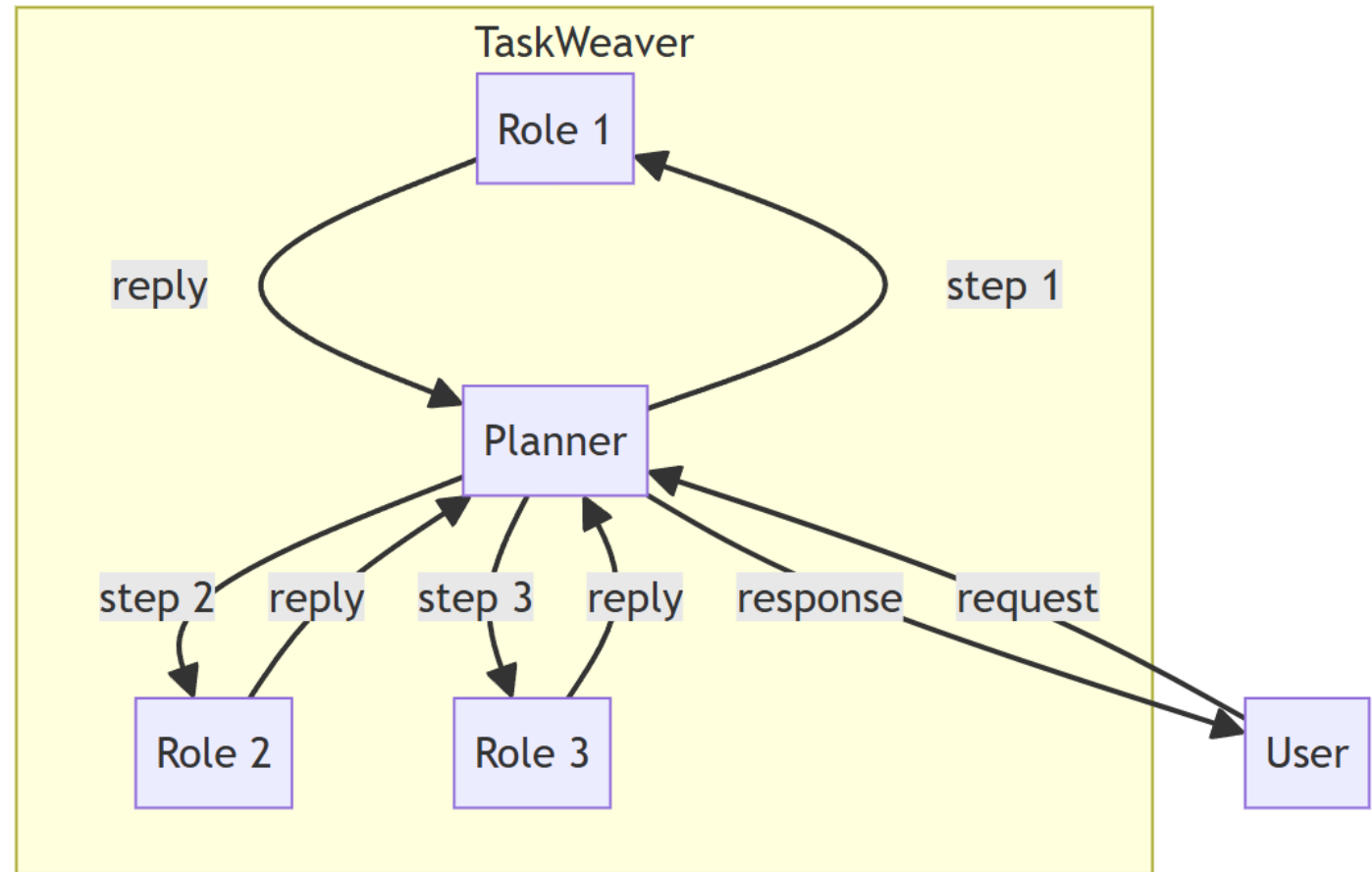
Plugins

- Code Interpreter is extendable with Plugins



Roles / Workflow

- The Planner decomposes the problem
- Roles are used as separate agents
- The user is notified with the final answer



Getting started: Clone the repository

- Clone:
<https://github.com/nata108/LMSC.git>
- Password for the API-key file is: **Wigner2024!**



Setup LLM for Taskweaver

- OpenAI API supported!
- Open-source (local) alternatives
 - Ollama
- Add API key and set the model to GPT-4o at ***project/taskweaver_config.json***
- Setup web app
 - ***pip install -U chainlit***



Webapp

- ***cd playground/UI/***
- ***chainlit run app.py***
- *Go to:*
<http://localhost:8000/>
- *Upload sunspot data*



Extensions

Role	Plugin
A new type of Agent or participant	Coding „workflow”
Entire workflow	Should be callable in Python
LLM-based operations mainly	Code-based operations mainly (you could call an LLM)
Example: CitationManager, CommonSenseInterpreter	Example: ExperimentDataQuery, SemanticSearch, WeatherForecast



Develop a Plugin

- Example: Finite-difference Time-domain simulation
- Define a flexible framework



Develop a Plugin

- TaskWeaver reads the YAML configuration

```
parameters:
```

```
- name: param1
```

```
  type: int
```

```
  required: true
```

```
  description: Rules on
```

```
how to fill this.
```

```
name: my_plugin
```

```
enabled: true
```

```
required: false
```

```
description: >-
```

```
  my_plugin does...
```

```
examples:
```

```
  value = my_plugin(param1)
```

```
returns:
```

```
- name: value
```

```
  type: int
```

```
  description: Rules on
```

```
how to interpret this.
```



Develop a Plugin

- Use the `@register_plugin` decorator
- Define a `__call__` function with the same signature

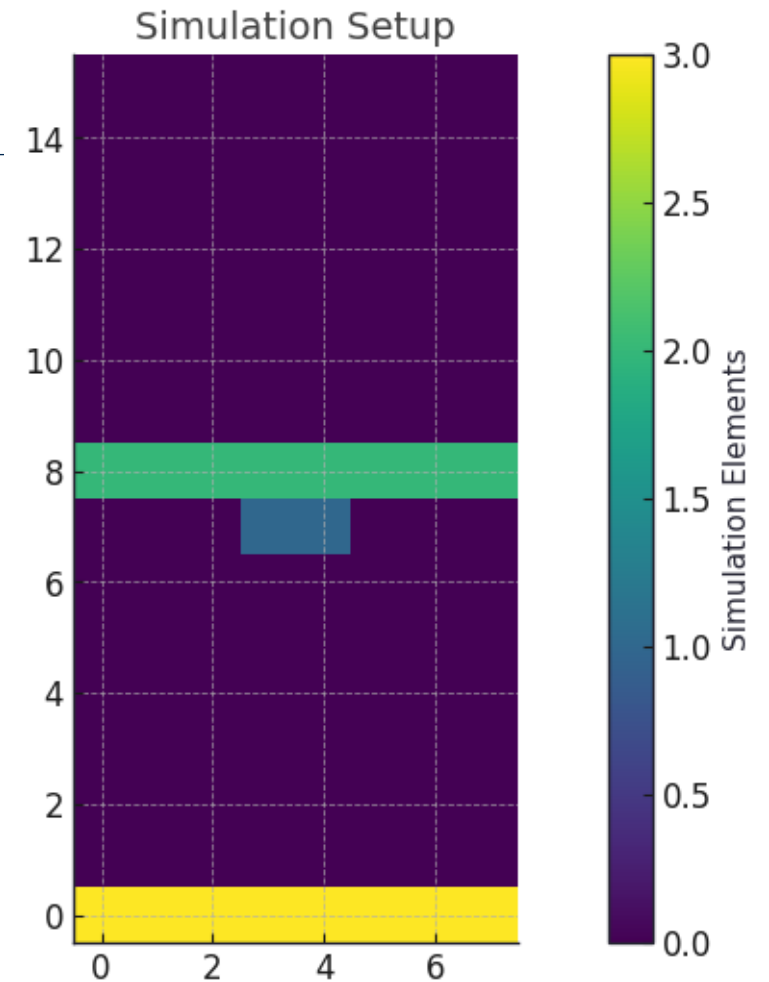
```
@register_plugin
class MyPlugin(Plugin):
    def __call__(self, param1):
        pass
        return value
```

Beware TaskWeaver will block during the execution of the plugin code!



Develop a Plugin

- Compare results with FDTD plugin and without it!
- Update three body problem related plugin using your preferred algorithm!



Develop a Plugin

- Compare results with FDTD plugin and without it!
- Update three body problem related plugin using your preferred algorithm!

