Project Internship – Intelligent Agents

Winter 2023/2024

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UNIVERSITÄT ZU LÜBECK
INSTITUT FÜR INFORMATIONSSYSTEME

Organisation
General
Presentations
Schedule

Software
Docker-Container
Project Package
SPADE

Exercise 1

Next Steps

General

- Groups of 2 or 3 students
- In total 3 exercises (around 4 weeks per exercise)
- Each exercise depends on the previous ones
- Short presentation of results
- Upload your solutions (zip containing code)

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Goal

Implementation of an intelligent information retrieval (IR) agent with SPADE

Presentation

- Groups present their solution per exercise
- In the end all groups must have presented at least twice
- Around 15 minutes per group including questions
- Focus on your decisions and distinctions to others (audience solved same exercise)
- English or german depending on audience

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Decisions and Distinctions

It is a project and thus tasks may be solved in different ways.
It is intended, that tasks are less restricted and students develop their own solutions.

Schedule

20. October

- Release Exercise 1 (Deadline 17. November)

17. November

- Presentation Exercise 1
- Release Exercise 2 (Deadline 15. December)

15. December

- Presentation Exercise 2
- Release Exercise 3 (Deadline 26. January)

26. January

- Presentation Exercise 3
- *Roundup*

Software

- Python 3.10
  - Smart Python Agent Development Environment (SPADE)
  - Natural Language Toolkit (NLTK)
  - Gensim
- Prosody IM[1]

[1] XMPP server needed by SPADE

Software

- Python 3.10
  - Smart Python Agent Development Environment (SPADE)
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Many dependencies and sometimes partly hard to install.

[1] XMPP server needed by SPADE

Docker-Container

- Provide a Docker-Container containing everything for project
- Need to install Docker and run Container[2]
- Setup Guide[3] (mainly for Docker)

[2] https://hub.docker.com/r/kilabor/ia-project
[3] https://www.ifis.uni-luebeck.de/~bender/lehre/ws2324/ia/setup/

Project Package

- Project Package in Moodle[4]
- Contains code for testing your setup (example Agent using SPADE) and some utility functions
- Structure to solve exercises in

[4] https://moodle.uni-luebeck.de/mod/resource/view.php?id=421670

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Demo

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Demo

Note

We recommend to use the Docker-Container, but a group may use their own setup and project structure.
Please add notes how to run!

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SPADE

Overview

- Asynchronous Python framework for building agents
- Agents communicate via an XMPP server
- Agents may be specified, e.g., as finite state machines

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Hint 1

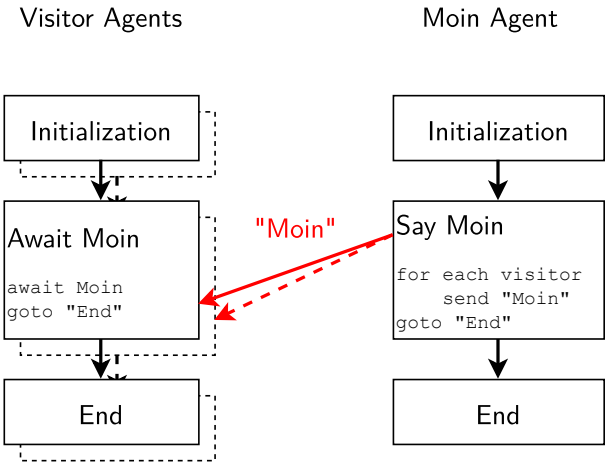
We recommend to separate the agent and the internal functionalities into multiple files/ classes/ functions.

Hint 2

The error reporting of functions run by SPADE is not so good and multiple threads may be confusing. Thus, implement the internal mechanisms separately from the agents integration. *There is a* `spade_traces.sh` *script, which enables traces in SPADE state machines.*

SPADE

Example Agent



Exercise 1

- Auction of text documents from Wikipedia
- Two IR agents have a corpus of text documents, want to maintain corpus by extending it
- Auctioneer offers documents to both agents, each may give a single bid
- Each agent has different queries to fulfil, thus different values for different documents

→ Simple strategy using tf.idf and getting to know SPADE

- Next exercises improve the agents and add functionality

[5] https://scikit-learn.org/

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Hint 3

Python provides many useful packages, e.g., `sklearn`[5] is installed in our Project Package.

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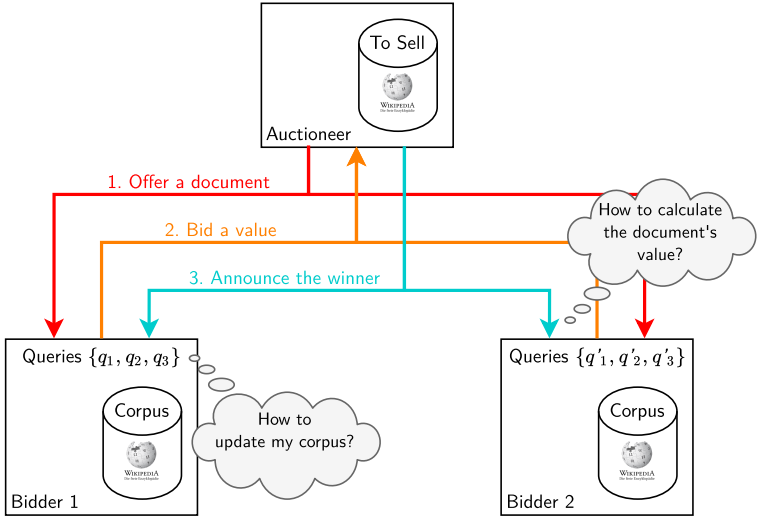
Exercise 1


To Sell
Auctioneer
1. Offer a document
2. Bid a value
3. Announce the winner
How to calculate the document's value?
Queries $\{q_1, q_2, q_3\}$
Corpus
How to update my corpus?
Bidder 1
Queries $\{q'_1, q'_2, q'_3\}$
Corpus
Bidder 2

Next Steps

- Questions?!
  - Moodle Forum[6]
  - bender@ifis.uni-luebeck.de
- Slides and exercise sheet, including all resources, available in Moodle
- Look for group and join in Moodle (until 17.11.)
- Start solving the exercise

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Help?!

If reasonable, we will have a Q&A session. Maybe even via Webex, so that everyone can use the computer they mainly work with.

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