Project IA

Magnus Bender

Exercise 1
Recap
Possible Solution
 Selling Agent
 Bidding Agents
 Results
Feedback

Exercise 2

Project Internship – Intelligent Agents
Winter 2023/2024

Magnus Bender

Institute of Information Systems – IFIS
University of Lübeck

17. November 2023

UNIVERSITÄT ZU LÜBECK
INSTITUT FÜR INFORMATIONSSYSTEME

Recap

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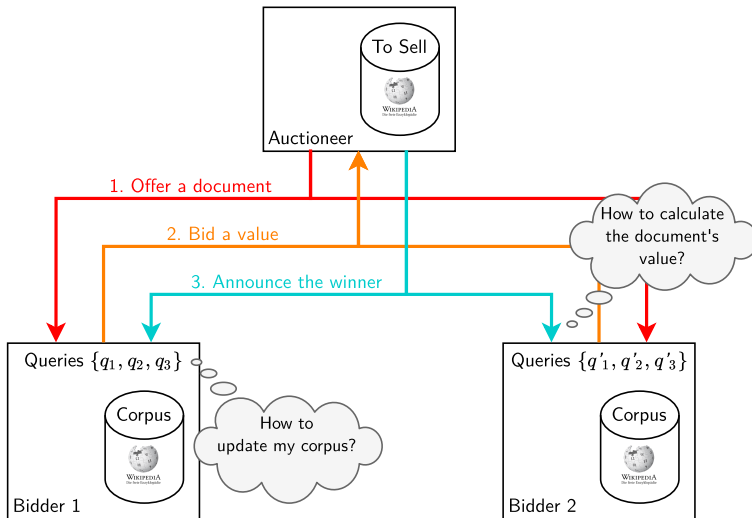Exercise 1
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Exercise 2

- ▶ 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

Recap

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Possible Solution

Agent Setup
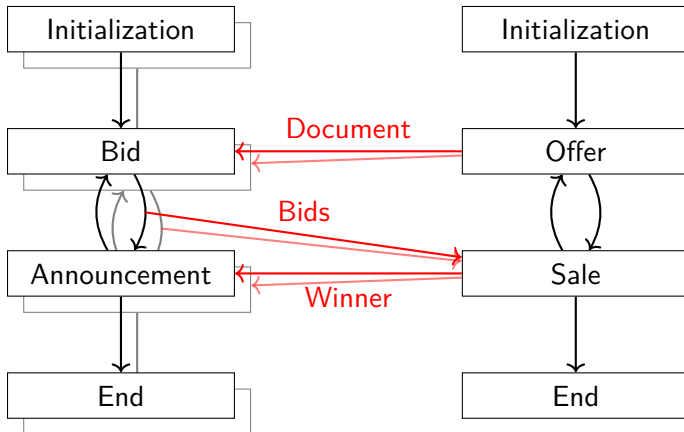
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Selling Agent

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Exercise 2

Sells all documents one by one:

1. Sends document to all bidders first
2. Waits for all bids and awards document
3. Announces winner to all bidders

Bidding Agents

- Value of a document defined as similarity to the queries
  1. Los Angeles, Chicago, Houston
  2. Mads Mikkelsen, Johnny Depp, Sean Penn

Bidding Agents

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- ▶ Value of a document defined as similarity to the queries
  1. Los Angeles, Chicago, Houston
  2. Mads Mikkelsen, Johnny Depp, Sean Penn
- ▶ Each agent uses two tf.idf models
  - ▶ Model of the corpus, updated for each bought document
  - ▶ Model of the three queries

Bidding Agents

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- Value of a document defined as similarity to the queries
  1. Los Angeles, Chicago, Houston
  2. Mads Mikkelsen, Johnny Depp, Sean Penn
- Each agent uses two tf.idf models
  - Model of the corpus, updated for each bought document
  - Model of the three queries
- Value function
  - Based on similarity to the three queries sim_q and similarity to the (current) corpus sim_c
  - No bid for irrelevant documents ($sim_c < 0.05$)
  - Linear function $bid = sim_q \cdot 80 + sim_c \cdot 20$
  - Similar > 0.3 and very similar > 0.4 documents to a query get a bonus of 50 and 100

Results I

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```
==> Auctioneer
        All 146 documents finished and got overall 11290 money.

    Top Prices:
        Worcester, Massachusetts 386
        Knoxville, Tennessee 386
        Akron, Ohio 386
        Amarillo, Texas 386

    Documents Sold to:
        bidder1@localhost (Los Angeles – Chicago – Houston)
            Lost 276 money for overpaid documents.
            ..., Montgomery, Alabama; Little Rock, Arkansas; ...

        bidder2@localhost (Mads Mikkelsen – Johnny Depp – Sean Penn)
            Lost 11 money for overpaid documents.
            ..., Patrick Stewart; Russell Crowe; Peter Sellers; ...

        nobody
            Advent; Christmas decoration; Christmas dinner; ...
<==
```

Results II

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```
==> Bidder:
    bidder1@localhost - Los Angeles - Chicago - Houston

    Got 36 documents while giving 65 bids and spent overall 5213
    money (average 144.81 per document).
    Got value of 5213 and overall value of sold documents 5499,
    missed 286 value
<==


==> Bidder:
    bidder2@localhost - Mads Mikkelsen - Johnny Depp - Sean Penn

    Got 35 documents while giving 56 bids and spent overall 6077
    money (average 173.63 per document).
    Got value of 6077 and overall value of sold documents 6257,
    missed 180 value
<==
```

Feedback

Any feedback regarding organisation, first exercise, etc.?

Exercise 2

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Exercise 2

- ▶ Add human-aware query answering functionality
- ▶ Use Latent Dirichlet Allocation (LDA) to model corpus' topics
- ▶ Add two questioner agents to the existing three agents
- ▶ Both IR agents start with known corpus, but get different queries
- ▶ Corpus gets extended by bought documents while queries are answered
- → IR agents answer queries and also bid in auction to extended their corpora
- ▶ Next exercise improve the agents bidding strategies

Exercise 2

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- ▶ Add human-aware query answering functionality
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- ▶ Add two questioner agents to the existing three agents
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- ▶ Corpus gets extended by bought documents while queries are answered
- → IR agents answer queries and also bid in auction to extended their corpora
- ▶ Next exercise improve the agents bidding strategies

- ▶ New sheet on Moodle
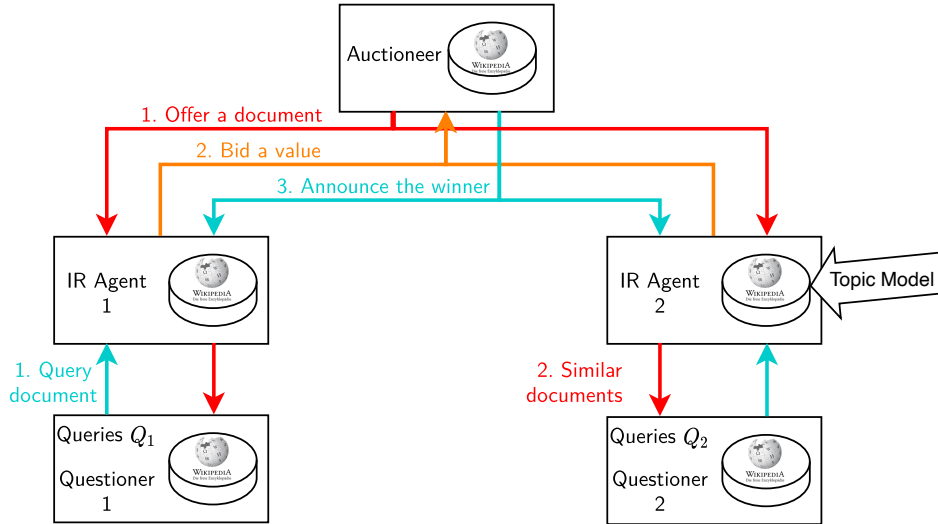- ▶ Updated *Project Package* in Moodle

Exercise 2

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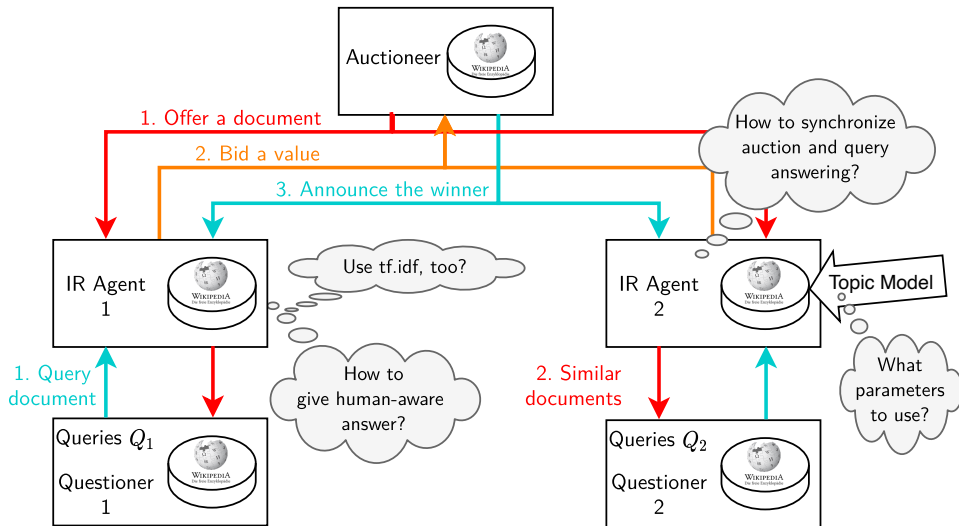Bidding Agents
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Selling Agent
Bidding Agents
Results
Feedback

Exercise 2

11 / 12

Questions?