

KEELE UNIVERSITY

FHEQ Level 7

MSc ARTIFICIAL INTELLIGENCE AND
DATA SCIENCE

CSC-40045

DISTRIBUTED INTELLIGENT SYSTEMS

Coursework Part 2

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A Java-based simulation of agent behaviour and transactions

User Manual

How to run it?

Project folder included with .java files, .class files, books catalogue and dist folder which is used to run the programme.

To run the project go to the dist folder and then type the following in the command prompt:

```
java -jar "BookTrading.jar"
```

How it works?

This simulation has **5 buyer agents** to buy books and **10 seller agents** to sell books on behalf of buyers and sellers. Each buyer agent can do 3 purchases with a £ 50 maximum spent limit.

Operations relevant to the buyer agents are included in the 'Buyer' class and Seller agents' operations are included in the 'Seller' class. Coordination between both, seller and the buyer are done by the 'BookTrading' class which plays the mediator role in the operation. Book catalogue/List is saved in a separate file called 'books' and adding new books option is available for the sellers.

Step 1

Sellers can review the Book List available in the system and then, can add books they need to sell by answering 'Y' to the question "Add more books?". They can add one or more books to the list, by entering name and price of books in to the system or answering 'N' to discontinue.

Step 2

Each buyer agent receives the title of the book to buy (the “target book”) as a random input and periodically requests from all known seller agents to submit an offer.

Sellers’ agent receives their sellers’ available books for sale as a random selection. If buyer’ agents’ requested book is available in their catalogue, then they give an offer. Likewise, buyer agents receive multiple offers from sellers’ agents.

After receiving the offers from seller agents, buyer agent accepts best offer (lowest one) and issues a purchase order. Each Buyer agent stops buying books when they reach the wallet limit which is £50. If they do not have sufficient funds to buy a specific book, shows a message “insufficient funds” and the available balance.

When the seller agent receives the purchase order, they serve it and remove the requested (copy of the) book from their catalogue.

Above mentioned buying & selling process runs for 15 iterations as per the 5 buyer agents x 3 purchases in the simulation.

Step 3

As the final outcome income statement for each seller and statement of spending for each buyer listed at the end.

Execution time: Approximately 20 seconds (except the time to add books to the Catalogue by the seller)