

Concurrence et répartition

Inspector Prolog

Logbook

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Week 1

21.02.2023 - 27.02.2023

Our objective(s) :

For the first week our goal was mainly to refresh our knowledge of prolog programming. We also started to think about how to realize the project: which game mechanics to use, how to set up the educational aspect and how to define the scenarios so that it would be possible to generate them randomly afterwards. (Random generation of investigations will not necessarily be possible due to the duration of the project, but we feel it is important to make sure that our work is reusable in case we want to take the project further.)

What we researched :

To get back into prolog we used the resource given for this project¹, the slides of the course "sémantique des langages informatiques", and a tutorial found online².
For the game mechanics, we were mainly inspired by the Ace Attorney games.

What we produced :

As we mainly studied prolog programming we did not produce anything concrete, but a small part of the test performed can be found in the file *test.pl* in the *Project* folder.

Our next goal(s) :

Next week we plan to finish looking back at how prolog works, plan the different stages of the project over the semester and clarify the chosen game mechanics.

¹<https://www.metalevel.at/prolog>

²<https://www.let.rug.nl/bos/lpn//lpnpage.php?pageid=top>

Week 2

28.02.2023 - 07.03.2023

Our objective(s) :

For this week our objectives were to continue to familiarise ourselves with prolog and choose game mechanics, to plan the different stages of our project and prepare the presentation for 7 March.

What we researched :

For the prologue part, we both looked at the CLP(FD) library which allows to evaluate arithmetic expressions and to reason on integers.

We also investigated how to pass a predicate as a parameter to another predicate. This will be useful to be able to apply the logical formula chosen by the user on the selected parameters. The best solution for this seems to be the `call()` function.

What we produced :

As last week a part of the tests done in prolog can be found in the file *test.pl*. We also prepared together the slides for the presentation of March 7 (which can be found in the folder *Presentations*) as well as the planning of the semester which is at the end of the presentation. The planning will be regularly updated during the semester according to our progress.

Our next goal(s) :

Our next objective is to design the database of facts that will allow us to define a case (clues, witnesses, usable logical formulas, etc.)

Week 3

08.03.2023 - 14.03.2023

Our objective(s) :

This week our aim was to design the fact database. That is to say, to decide how a case and the elements that constitute it will be defined.

What we researched :

This week we did not do any research as such. We mainly focused on the design of our fact database.

What we produced :

We tested different options for our fact base to see what was possible or not and what worked best in relation to what we had planned. Some of those tests can be found in the file *facts_test.pl* (in the folder *Project*)

Our next goal(s) :

For the next week we will finish designing the facts database and start writing investigation scenarios.

Week 4

15.03.2023 - 21.03.2023

Our objective(s) :

This week our goal was to continue the design of the fact database while starting to write scenarios and figure out how to implement them in the database.

What we researched :

Our research focused mainly on finding ideas for scenario writing.

What we produced :

We have created a first simple scenario (in the file *scenario1.odt* in the *Project* folder) in which the player's goal will be to verify the alibis given by the suspects through the evidence to eventually find the murderer. Once the scenario was written we started to implement it (in the file *scenario1.pl*) and to be able to realize the missing elements in what we had planned.

Our next goal(s) :

Our goal for the next week is to continue the implementation of the scenario and to find solutions for the parts we are missing.

Week 5

22.03.2023 - 28.03.2023

Our objective(s) :

This week our aim is to continue implementing scenario 1, and working on any missing parts, as well as prepare our second presentation.

What we researched :

None conducted during this week.

What we produced :

Completed the implementation of the scenario 1 and prepared the slides for presentation 2

Our next goal(s) :

Our objective for next week is to resolve the problems encountered in the logical rules implementation.

Week 6

29.03.2023 - 04.04.2023

Our objective(s) :

This week our objective was to solve the various problems in the logical rules from the fact database.

What we researched :

For this week, we didn't do any research.

What we produced :

We focused on the was_in and has_alibi rules and managed to resolve the problems we encountered last week and implement both rules in scenario 1.

Our next goal(s) :

Our goal for next week is to start working on the mechanics of lying persons and on smoker property.

Week 7

05.04.2023 - 18.04.2023

Our objective(s) :

Our goal for this week is to start working on the mechanics of lying persons and on smoker property.

What we researched :

For this week, we didn't do any research.

What we produced :

We implemented a first version of liar rule and of smoker. For liar we have a problem of infinite recursion if the person is not lying but it is working if the person lies. For the smoker property the difficult part is to link it to the alibi. Both issues will be addressed in the following weeks

Our next goal(s) :

Our goals for next week are to write a second scenario and start thinking about user interaction and prepare presentation 3.

Week 8

19.04.2023 - 25.04.2023

Our objective(s) :

This week our main goal was to start working on user interactions. We also prepared the third presentation.

What we researched :

As we decided that user interaction would be developed in Python, we did some research into ways of linking Prolog and Python code. More specifically, we looked at the libraries `mqi` and `pyswip`.

What we produced :

We've started to work on implementing user interaction in Python. We've also written a second scenario that uses the principle of lying characters and can be extended if we decide to add the search for the murder weapon and the motive to the game mechanics.

We also produced the slides for our third presentation.

Our next goal(s) :

From next week we'll be splitting our work in two. Léa will be working on the further development of the fact database and Joao on the user interaction part. The next goal will be to work on liar predicate and to start developing the python script.

Week 9

26.04.2023 - 02.05.2023

Our objective(s) :

This week we focused on the implementation of scenario 2 for the fact database and on starting to develop the Python script for handling user interactions and interfacing with the Prolog back-end.

What we researched :

We explored Python-Prolog interfacing using the PySwip library and Python best practices for interactive command-line applications.

What we produced :

- **Fact database** : We have implemented scenario 2 in Prolog. It can be found in the *Presentation/scenario2* folders.
- **User interaction** : Started building the foundational structure of the Python script. Focused on creating basic user prompts and capturing user inputs.

Our next goal(s) :

Our goal for next week is to develop the liar rule so that we can use it in scenario 2, to expand user interaction features and start interfacing with Prolog.

Week 10

03.05.2023 - 09.05.2023

Our objective(s) :

Our goal this week is to develop the predicate liar, to expand user interaction features and start interfacing with Prolog.

What we researched :

We dug deeper into the usage of PySwip library, particularly how to query the Prolog database from Python.

What we produced :

- **Fact database**) : The liar and tells_the_truth predicates have been implemented in the global fact database and in both scenarios. They have also been taken into account in the was_in rule.
- **User interaction** : Added more features to the user interaction aspect, allowing players to choose game scenarios. Started implementing Prolog querying from Python.

Our next goal(s) :

Our objectives for next week are to develop the smoker property and link it to was_in, to finalize Prolog querying from Python and ensure successful data exchange.
We will also be preparing our fourth presentation

Week 11

10.05.2023 - 16.05.2023

Our objective(s) :

Our objectives this week were to develop the smoker property, to finalize Prolog querying from Python and ensure successful data exchange. We also had to prepare presentation number 4.

What we researched :

For this week, we didn't do any research.

What we produced :

- **Fact database** : We have made progress in developing the smoker property. But the link with the `was_in` predicate could not be completed because there are problems attributing butts to smokers.
- **User interaction** : Implemented successful querying to Prolog and handling of query results in Python. Established the suspect, victim, and location data retrieval.

We have also prepared our fourth presentation, the slides of which are in the *Presentation* folder.

Our next goal(s) :

Our goals for next week are, for the fact database, to fix the problem with the smoker property, and to start developing the proof system. For the user interaction we will refine user interactions based on query results and add exception handling.

Week 12

17.05.2023 - 23.05.2023

Our objective(s) :

Our objectives this week were to sort out the problems linking smoker to was_in and to develop the proof system and to refine user interactions based on query results and add exception handling.

What we researched :

For this week, we didn't do any research.

What we produced :

- **Fact database** : Our main focus has been on developing the proof system, which will give the player a new objective. Once the murderer has been found, the player will have to provide a certain amount of evidence linking him to the crime in order to be able to prosecute him. We also worked on the predicate smoker and tried to link it to was_in. But due to infinite recursion in some cases, we've decided to use the property only in the proof system for now.
- **User interaction** : Enhanced the user interaction by refining how query results are presented to the player. Added exception handling for error scenarios. Began working on the "interactive query construction with the user" element of the game. Simple queries like "lost(X,Y)" were straightforward to implement.

Our next goal(s) :

Our objectives for the coming week are to finish implementing the proof system and the scenarios, and to implement game logic based on Prolog outputs and user inputs, focusing on complex queries.

Week 13

24.05.2023 - 30.05.2023

Our objective(s) :

This week our objectives were:

- To finish the template for the fact database (file *fact_database.pl*)
- To implement game logic based on Prolog outputs and user inputs, specifically addressing complex queries.

What we researched :

For this week, we didn't do any research.

What we produced :

- **Fact database** : We have completed the proof system and implemented it in all the scenarios. We also translated the scenarios into English.
- **User interaction** : Started integrating game logic into the Python script. Added decision-making based on Prolog outputs and user inputs. Encountered challenges with complex queries such as "was_in(X,Z) :- lost(X,Y), found_in(Y,Z)" but made significant progress in handling them.

Our next goal(s) :

In the final week, our goal will be to finalise and document the project and prepare the final presentation.

Week 14

31.05.2023 - 06.06.2023

Our objective(s) :

For the final week, our goal was to finalise the project and prepare the final presentation.

What we researched :

We looked at various examples of project documentation for inspiration.

What we produced :

For the user interaction part we finalized the game logic integration into the Python script, successfully handling even complex queries. We encountered and resolved an issue where a Prolog query was returning true infinitely. We performed extensive testing and fixed identified bugs.

As well as making the final changes to the code, we produced detailed documentation of our project so that it could be easily used or modified. This documentation can be found in the *README.md* file. At the same time, we commented on our code and reorganised the files to make everything more understandable.

We produced a very basic scenario, used as example in the documentation.

We also concentrated on the final presentation, the slides for which can be found in the *Presentation* folder.