PROCE⚡EUS

AI Legal Chatbot

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Project Purpose

- Provides an open source system that can assist people with tenant/landlord problems
- Regie du logement deals with constant requests and does not have the means to help in a timely manner
- Chatbot is an easy way of understanding and interacting with users

Marketability

- Subscription can be applied to the use of the software (SaaS)
- Can "recommend" certain legal infrastructures or partners for a monthly fee
- "PRO" version given to law firms and sell the license at a monthly fee
- etc. near infinite possibilities

Privacy

- Completely avoided the use of third party APIs to keep data "in house"
- Provide a clear and easy to understand EULA and Privacy Policy
- Users are pseudonymised (known only by conversation ID)
- Data is wiped on a regular basis (after improving ML models)
- Application is only served using TLS tunnel

Overall Architecture
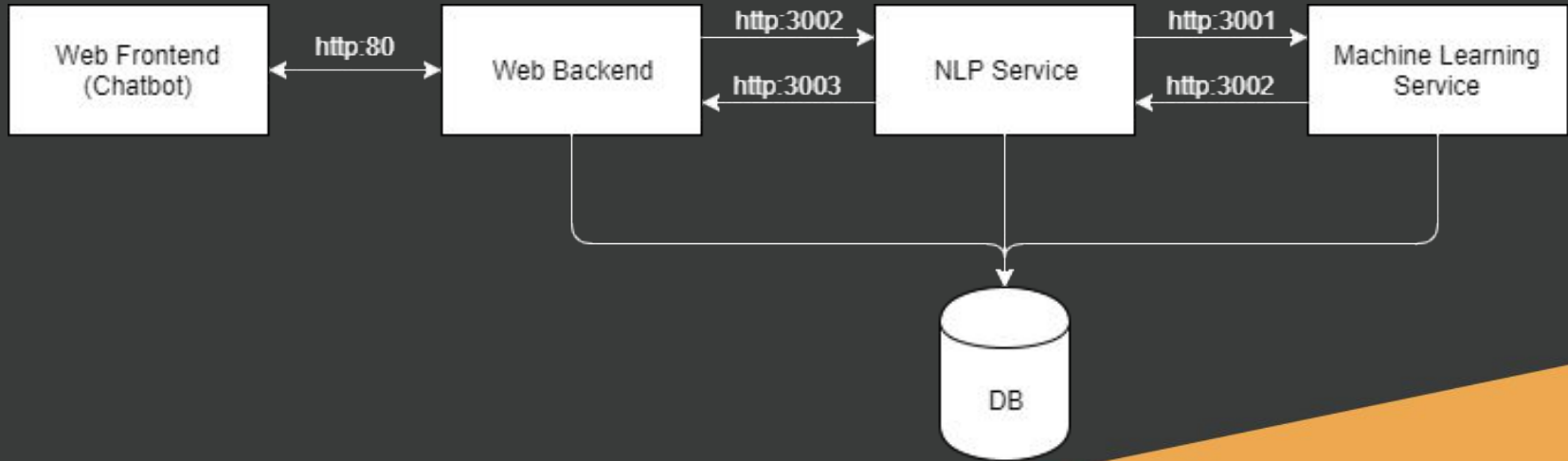
Dataset Used (Domain Model)
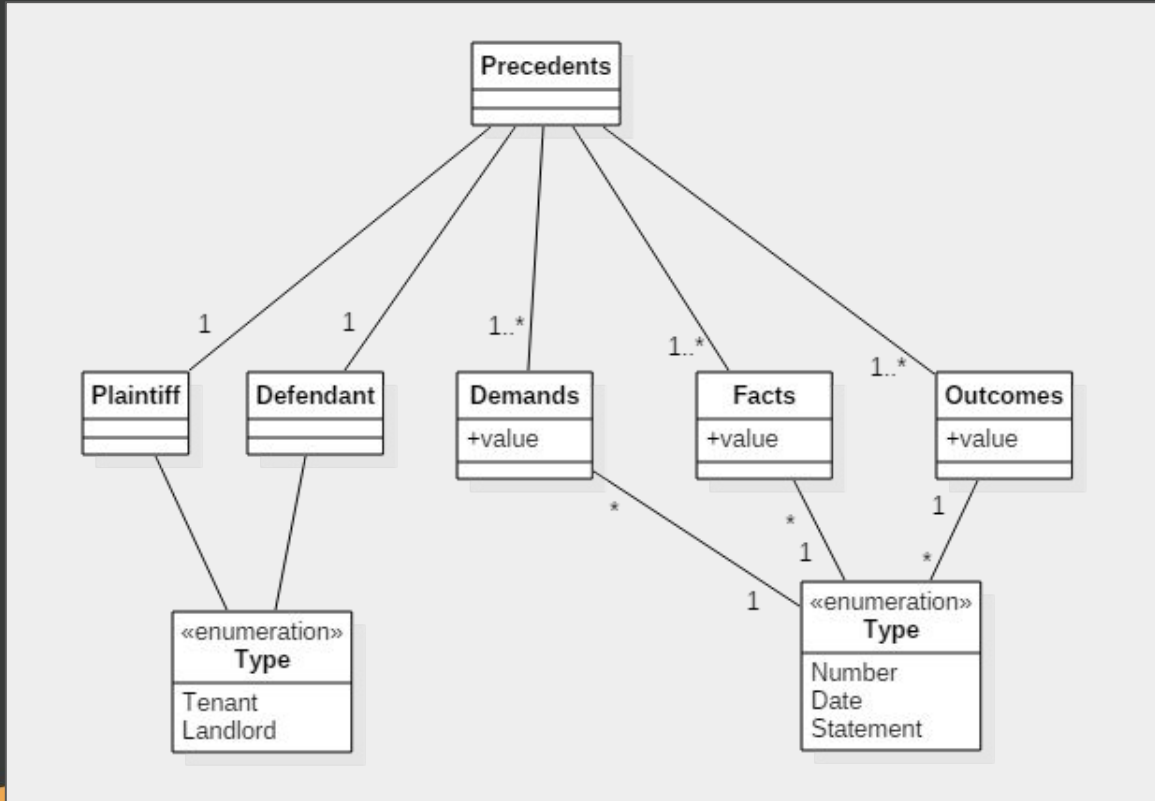
User Story 1 - Predict Lease Termination

- Initial user story concerning predictions
- Added Classifiers to predict whether or not a lease would be terminated

Story: https://github.com/Cyberjusticelab/JusticeAI/issues/183

Acceptance Metrics: https://github.com/Cyberjusticelab/JusticeAI/pull/316

Feature Extraction

Inspect Sample documents	Write regex to match statements	Evaluate regex correctness	Use entity extraction to extract values	Create Precedent Vectors

Inspect Sample documents
- Understand writing style of legal documents.
- Find common patterns among various documents

Write regex to match statements

Verify validity of regex using:
- Fact Coverage
- Manual inspection of regex matches
-

Evaluate regex correctness

Metrics used:
- % coverage of cluster sentences
- % of statement coverage per precedent
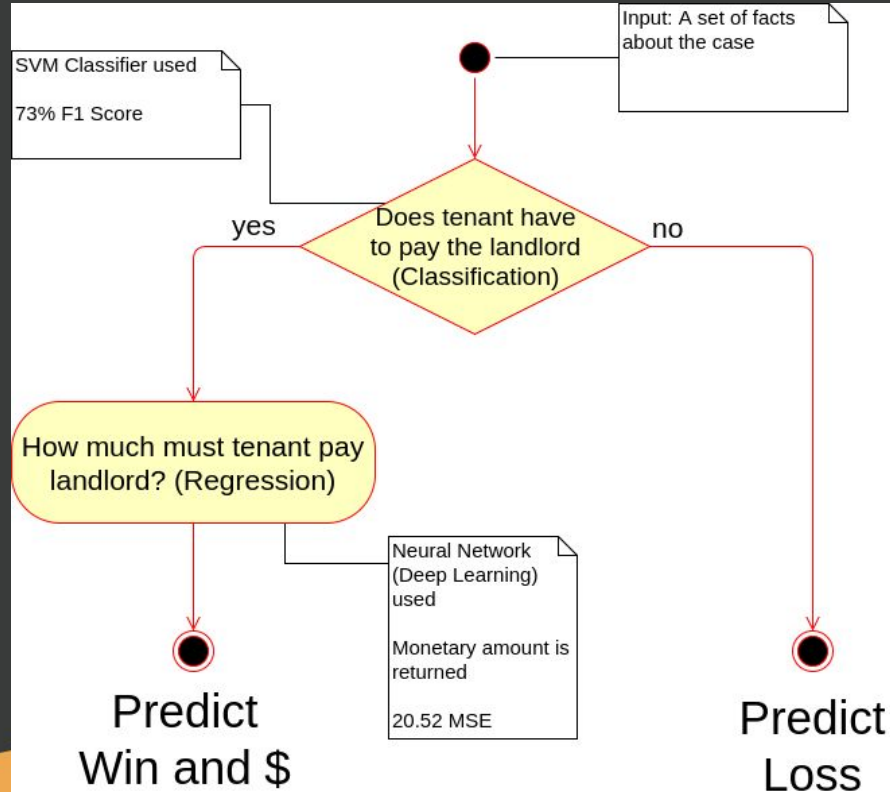
Use entity extraction to extract values

Extract the following entities:
- Money
- Date
- Number

Create Precedent Vectors

Obtain vector representation of precedents by using regex match.
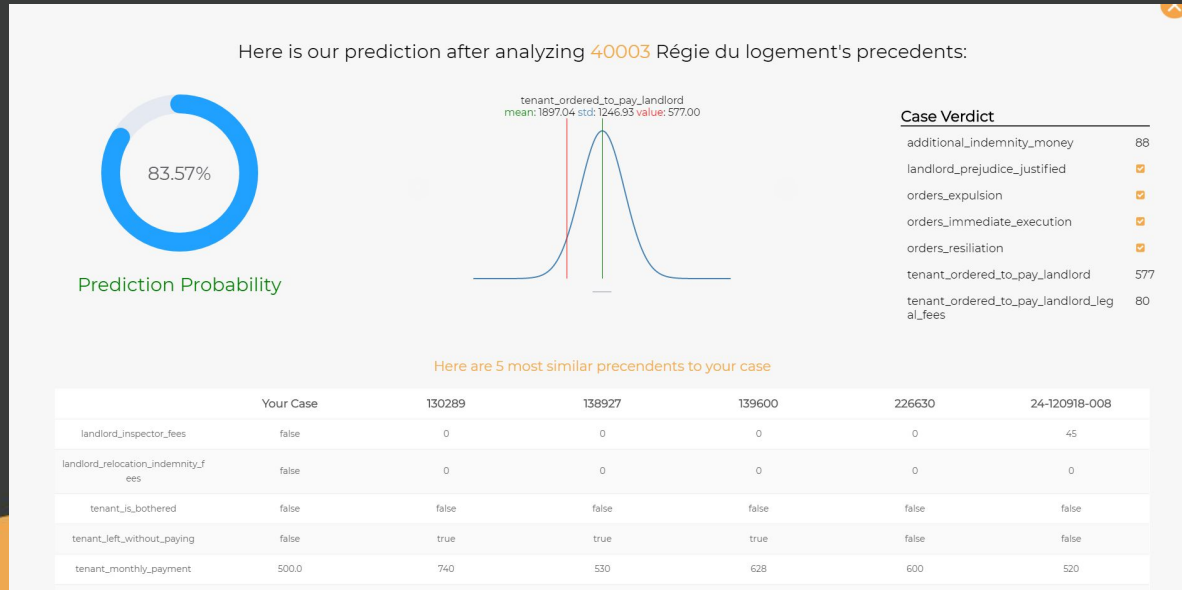
Prediction: Amount tenant owes landlord

User Story 2 - Dashboard Reporting of Results

- Story involves the display of all predictions in one screen

Story: https://github.com/Cyberjusticelab/JusticeAI/issues/43

Here is our prediction after analyzing 40003 Régie du logement's precedents:

83.57%

Prediction Probability

tenant_ordered_to_pay_landlord
mean: 1897.04 std: 1246.93 value: 577.00

Case Verdict

additional_indemnity_money	88
landlord_prejudice_justified	☑
orders_expulsion	☑
orders_immediate_execution	☑
orders_resiliation	☑
tenant_ordered_to_pay_landlord	577
tenant_ordered_to_pay_landlord_legal_fees	80

Here are 5 most similar precendents to your case

	Your Case	130289	138927	139600	226630	24-120918-008
landlord_inspector_fees	false	0	0	0	0	45
landlord_relocation_indemnity_fees	false	0	0	0	0	0
tenant_is_bothered	false	false	false	false	false	false
tenant_left_without_paying	false	true	true	true	false	false
tenant_monthly_payment	500.0	740	530	628	600	520

User Story 3 - Show precedents that are similar

- Determine which precedents are similar to your case
- Technique: Nearest Neighbours with Mahalanobis distance
- Limitations:
  - No access to evaluation metrics (Expensive to obtain manually)

Story: https://github.com/Cyberjusticelab/JusticeAI/issues/261

Current Predictions

- **Current Statistical ML Predictions**
  - Classification
    - Tenant Expulsion
    - Lease Termination
    - Tenant ordered to pay Landlord
    - Immediate Execution Justified
  - Regression
    - Monetary amount that the tenant must pay the landlord (Classification & Regression)
    - Indemnity fee that must be paid (Classification & Regression)
  - Similarity
    - Finding similar precedents to your case

Lessons Learned

- Do not rush to build a technical system.
- Market research and user testing are very important.
- Receive and analyze data before starting the project

Thank you!