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Kairntech Use Case: A Contract Analysis NLP Pipeline

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Introduction

- *NLP approaches have made huge progress on many use cases in the recent years*
- *Many previously hard to implement scenarios can now be addressed with impressive quality*
- *We focus today on how to combine various approaches to implement a contract analysis process*

Kairntech: “No code / Low code”

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No code / Low code:

Enable users to make use of NLP/AI without requiring them to be programmers

Adding your expertise

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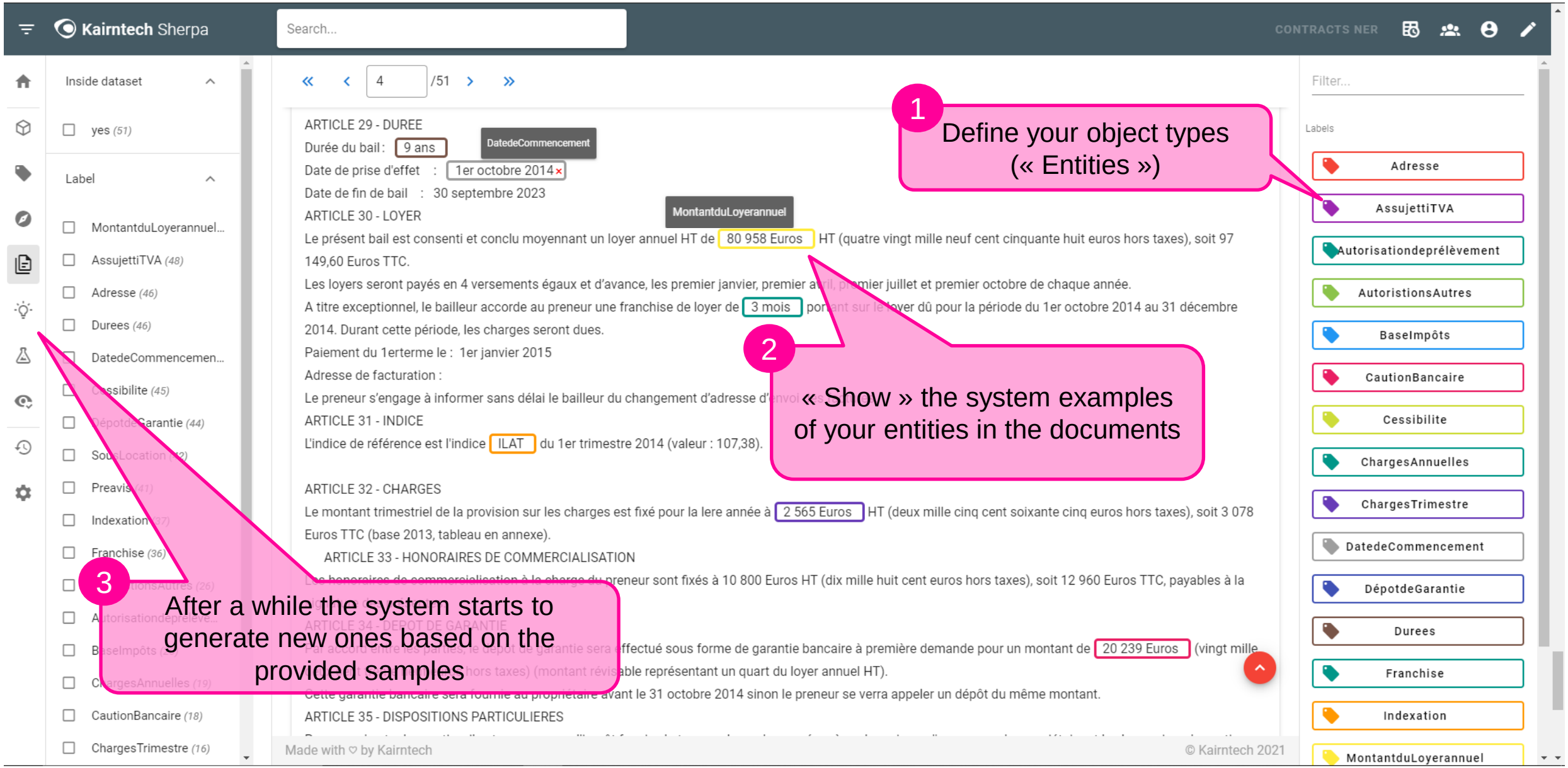

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Scenario today: Contract Analysis

- Due Diligence, Audit
- Tedious if done manually: Reviewing numerous complex/lengthy documents
- Time and cost vs Completeness!
- So: The scenario is:
  - We need to analyse Leasing Contracts
  - But these contracts are buried in a larger collection of other contracts
  - So we first need to find the Leasing Contracts in the larger set
  - Then extract key information from these

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Our task requires the combination of different approaches:

1. Document Categorization: Determine the type of a document
2. Entity Extraction: Which specific entities are mentioned in the text?
3. Combine individual analysis steps to a larger conditional processing pipeline

Contract Analysis Pipeline: Categorize, then extract if category is right

A contract analysis pipeline

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Import documents

Different unsorted contracts

Manually label documents: LeaseContract or not?

Train ML models

Train categorization model

Apply model on corpus → select only LeaseContracts

Manually label documents: Landlord, tenant, date, object?

Train entity extraction model

Combine models into Pipeline: Categorize → right category? → extract entities

Final pipeline, implementing the full process

All inside the system, not requiring any coding

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Demo

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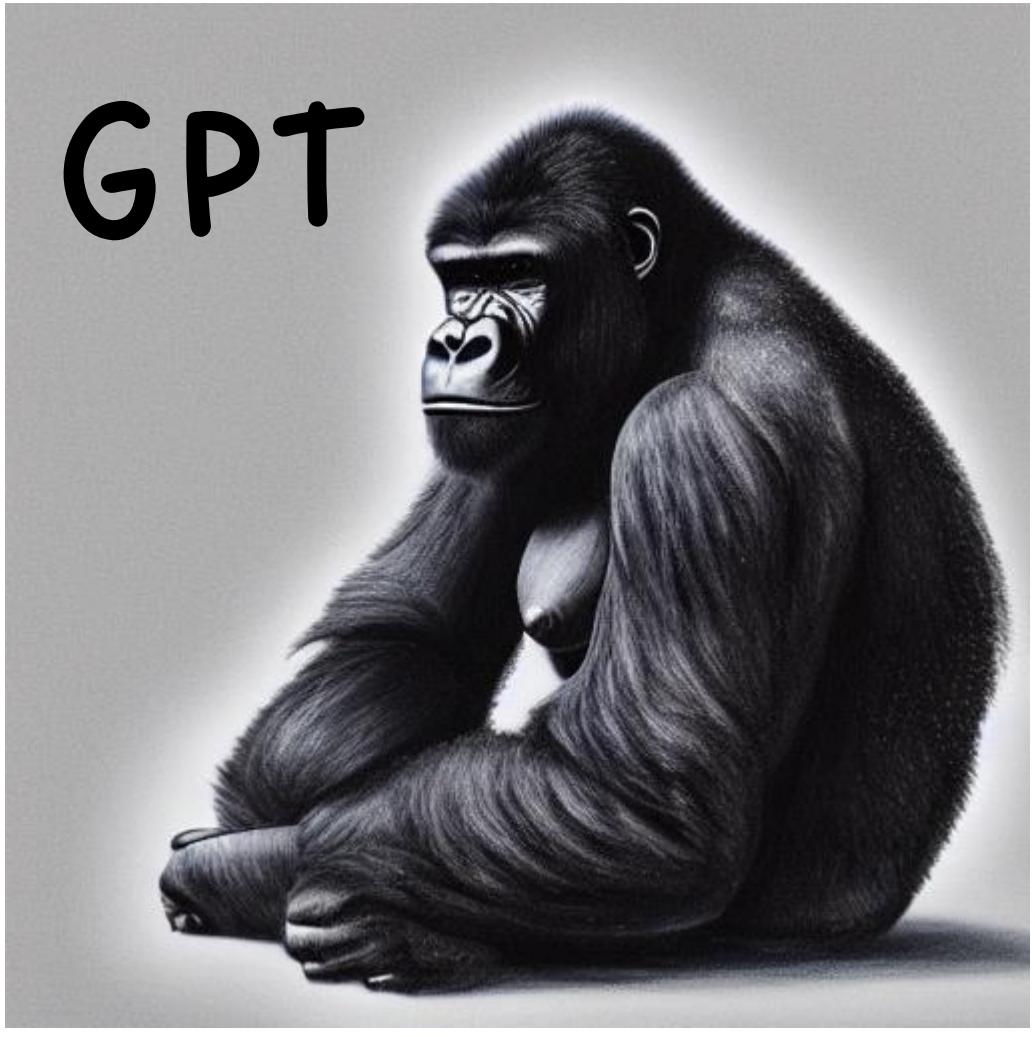
Whenever you talk about NLP these days:



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GPT – needs perhaps no introduction

- Most popular example of a new class of NLP models ("LLMs – Large Language Models").
- Fastest growing piece of software ever: >100mio users after only eight weeks
- Impressive results on a wide range of use cases: Text generation, question&answer, conversations
- Proprietory (openAI – Microsoft), others in preparation (Google, Facebook, …)
- Apparent potential to disrupt many business models

- … potential for our use case here too (Contract Analysis)?

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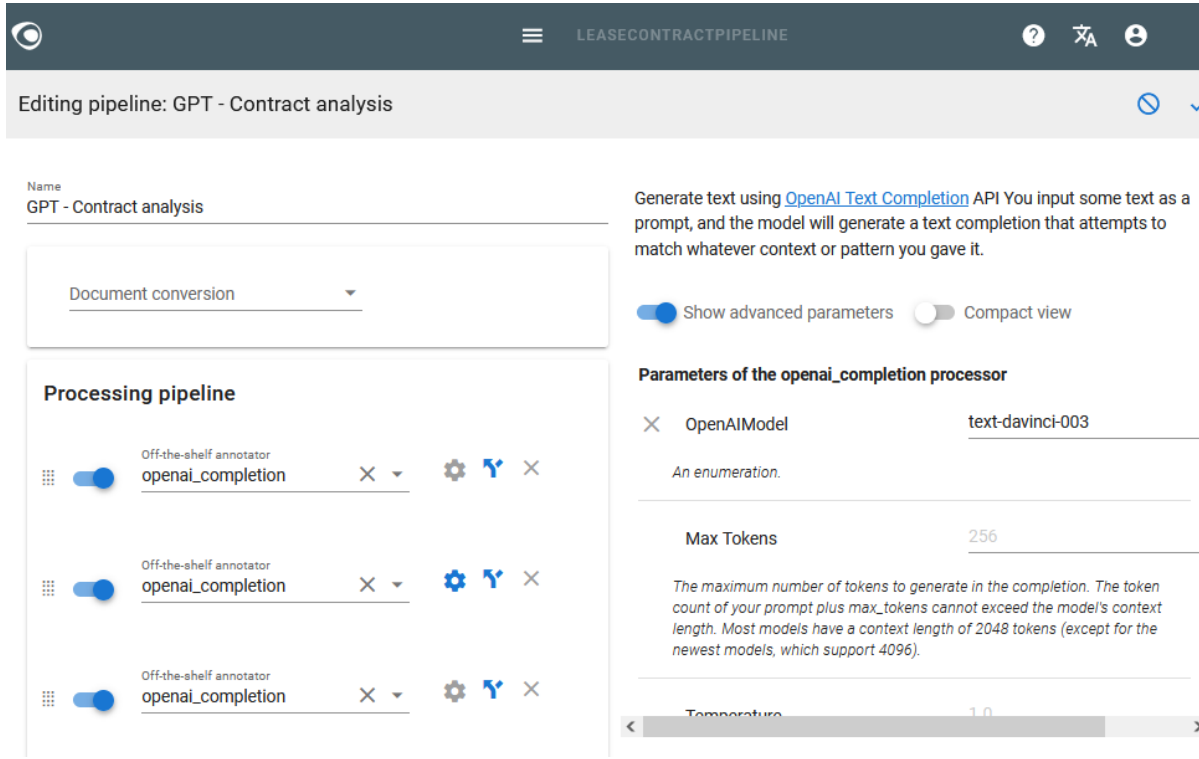
Kairntech as a multi component platform

- Kairntech integrates wide variety of components and models
  - DeepL, Spacy, Flair, BERT …
- … allowing to combine them into custom NLP pipelines
- And of course we have done the same with GPT



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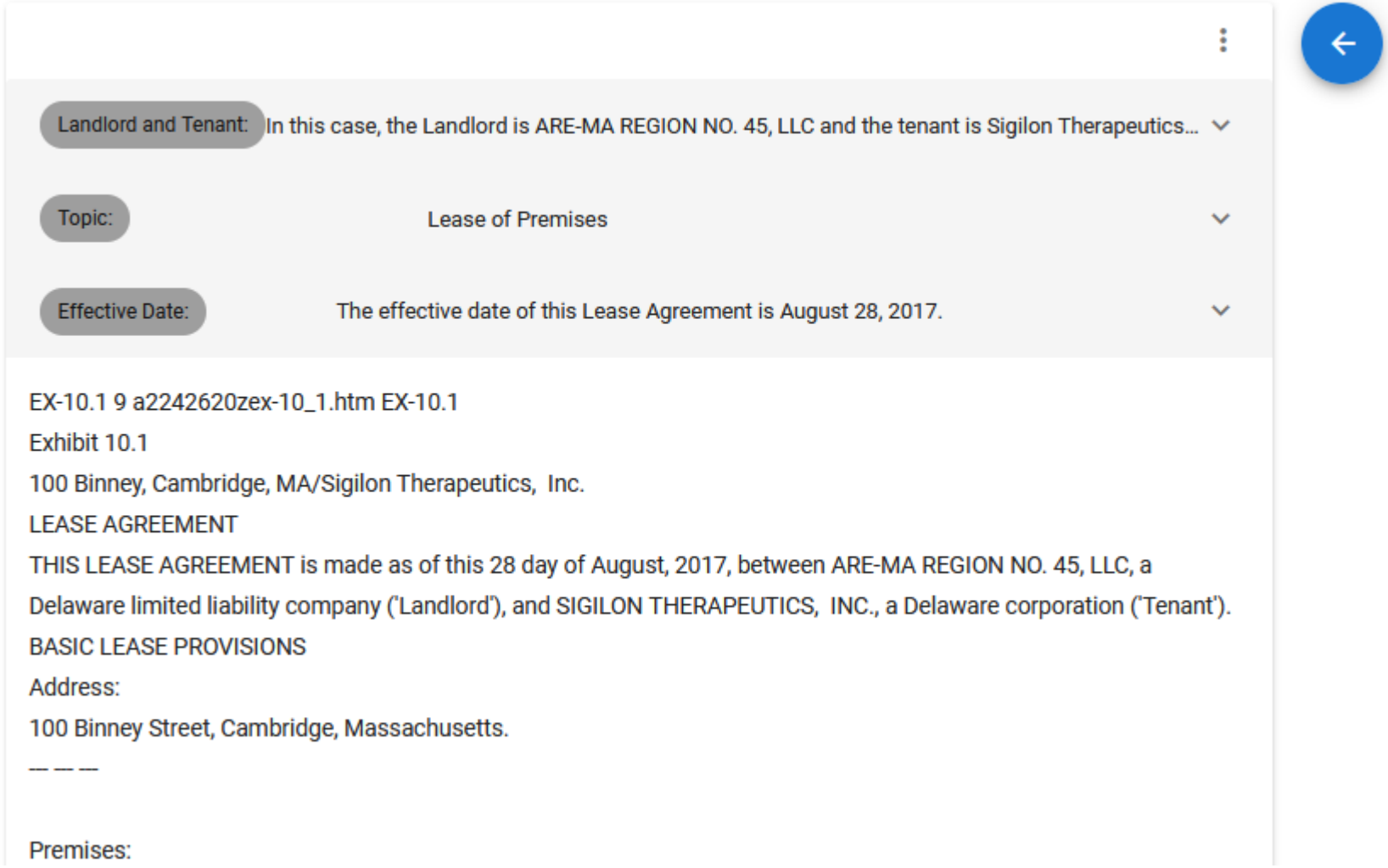
"Prompt":

- "Who is the landlord an
- "What is the topic of the
- "What is the effective da

Sample result:



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“Nice results! So: Was that it? Can we all go home now?”

Perhaps not quite yet!

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GPT without doubt has the potential to disrupt many use cases. To consider when thinking about deploying GPT-powered approaches:

- Cost?
  - Model “Davinci”: 0,02$/1000 tokens text.
  - Sample contract (50000 tokens) → 1$ per GPT analysis
  - Adapting (retraining) GPT-like models on your content / your vocabularies most often prohibitively complex → combine with other approaches.

- Confidentiality?
  - Currently GPT models can normally be run only on openAI infrastructure
  - Comparison with newer, smaller (open source?) models?

- Speed?
- Accuracy?
  - GPT-like models often seem to “hallucinate” (return unjustified answers)
  - Parameter tuning
  - “Prompt design” vs finetuning: When to favor what?

- Very dynamic landscape today: new models being published almost on a weekly basis.

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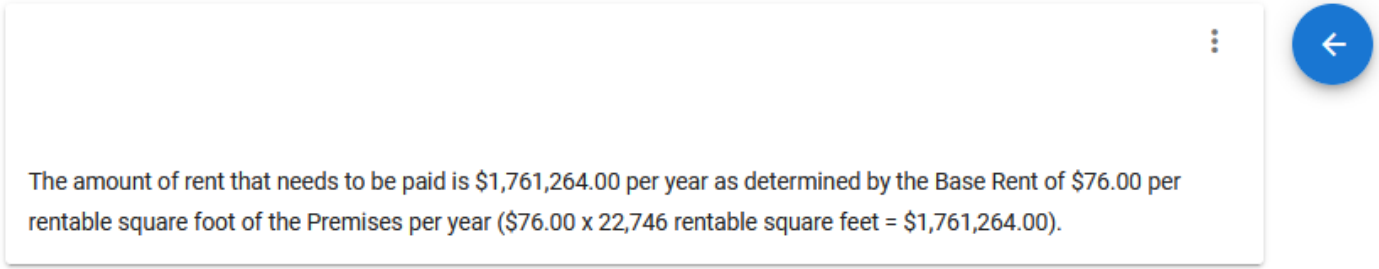
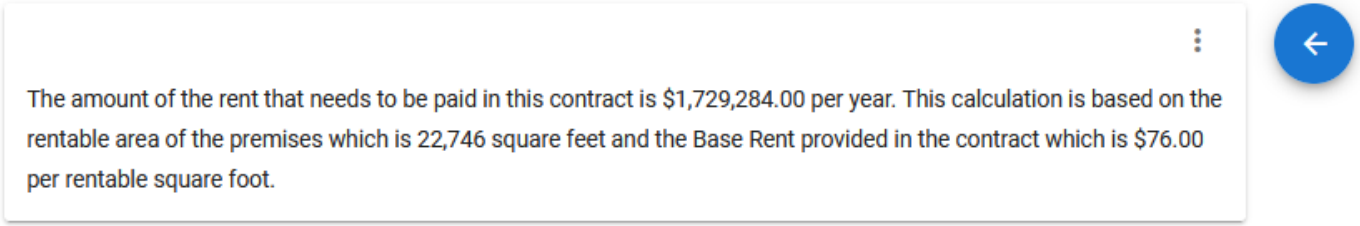
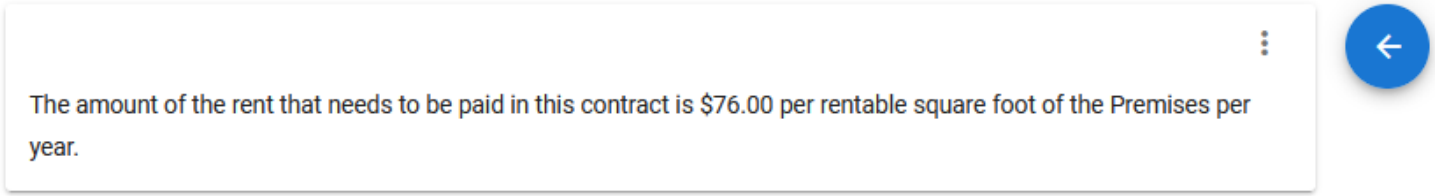
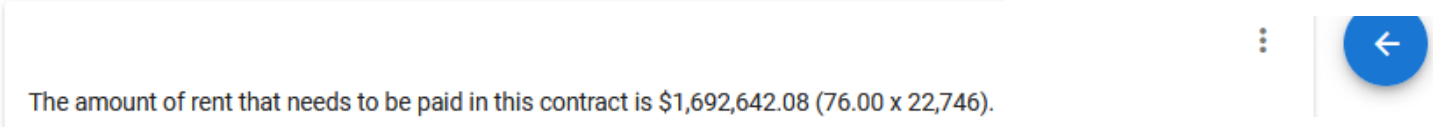
To consider(continued)

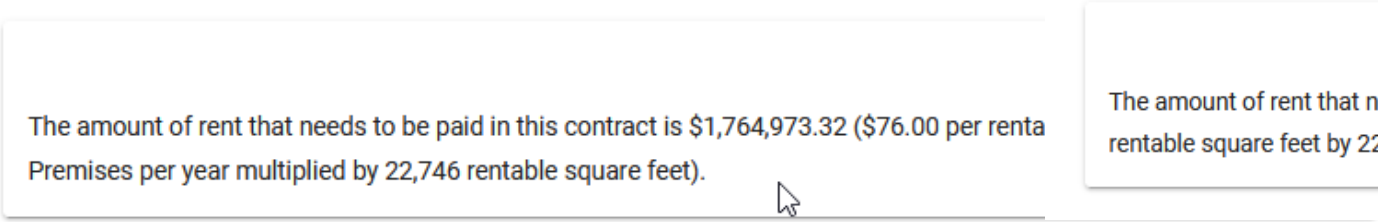
- Randomness
  - Default GPT returns different results on subsequent identical requests – even where no variation makes sense
  - (There are ways to reduce that: turn down “temperature”)
  - Example here: Asking GPT for the total yearly rent:

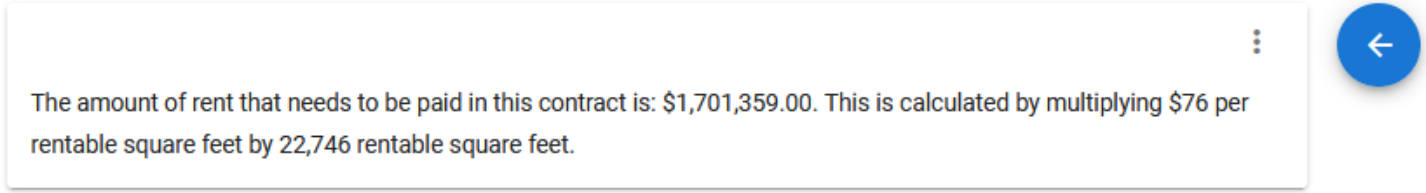












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To consider (continued):

- The entity types in our example (Landlord, tenant, date, address) are very common, GPT picked them up out of the box
- Often, Contract analysis is about more detailed and sophisticated concepts
- Adding these in a GPT-powered scenario often requires finetuning GPT models (with at least 200-300 examples)
- Use Kairntech for generating this finetuning data set (and using it to finetune GPT, where this makes sense)?

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GPT (and comparable models) are major piece of technology, affecting many use cases. A fast succession of leaps can be expected in the months and years to come, further extending capabilities and impact.

It should be seen as a tool, to be assessed with its strengths and limitations in order to determine whether, where and how to best be employed on your use case.

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And now?

- Learn more about Kairntech and what we do
  - Website with use cases, blog, product description: www.kairntech.com
  - Product video: https://kairntech.com/doc/video/
  - Documentation, FAQ: www.kairntech.com/doc
- Interested to try it out yourself? (no costs, no commitment)
  - Ask for a free trial www.kairntech.com
- Any suggestion, question, comment?
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Thank you for your attention!

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