UPTYCS INTERNSHIP PROJECT

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PROBLEM STATEMENT:

Design a Q&A system which takes a question as input and returns the intent and entities using a REST based or GRPC based server.

RESEARCH:

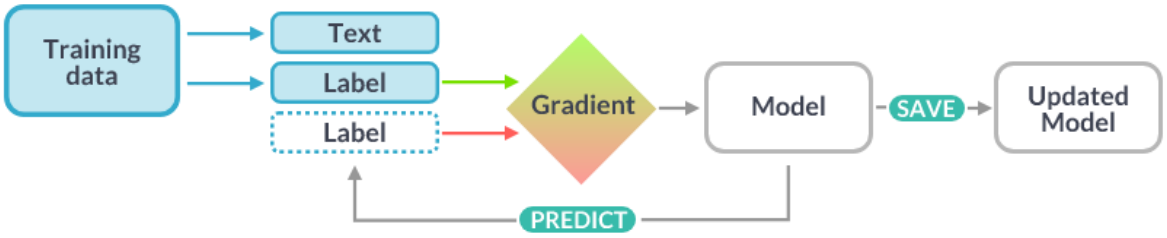
- Studied to get a good understanding of NLP basics.
- Learnt about fundamental concepts (intents, entities, transformers, pipelines, models, tokenizers, featurizers, word embeddings) and tools and libraries used.
- Read through multiple research papers
- In order to solve the problem statement we looked at 3 models out of which we were able to implement 2 of them.

MODEL 1:

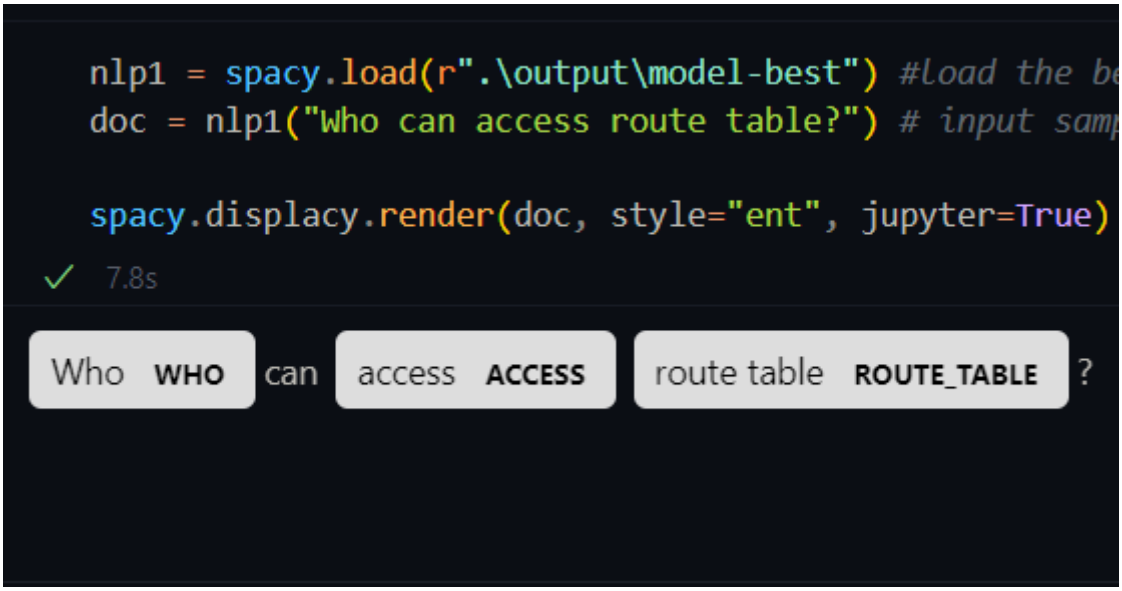
- Joint model for NER (Named Entity Recognition) and IC (Intent Classification) using BERT

- BERT (Bidirectional Encoder Representations from Transformers)
- A specific, large transformer masked language model based on deep learning
- Difficult to implement due to a lack of data
- Research Paper: https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=9599152

MODEL 2:

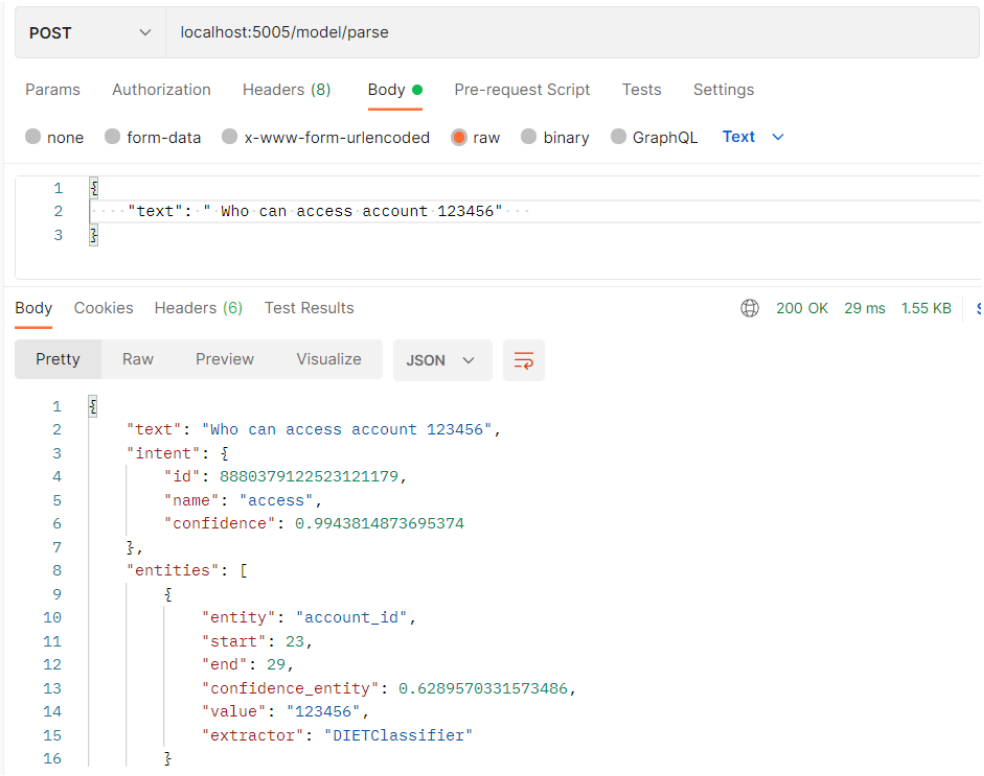


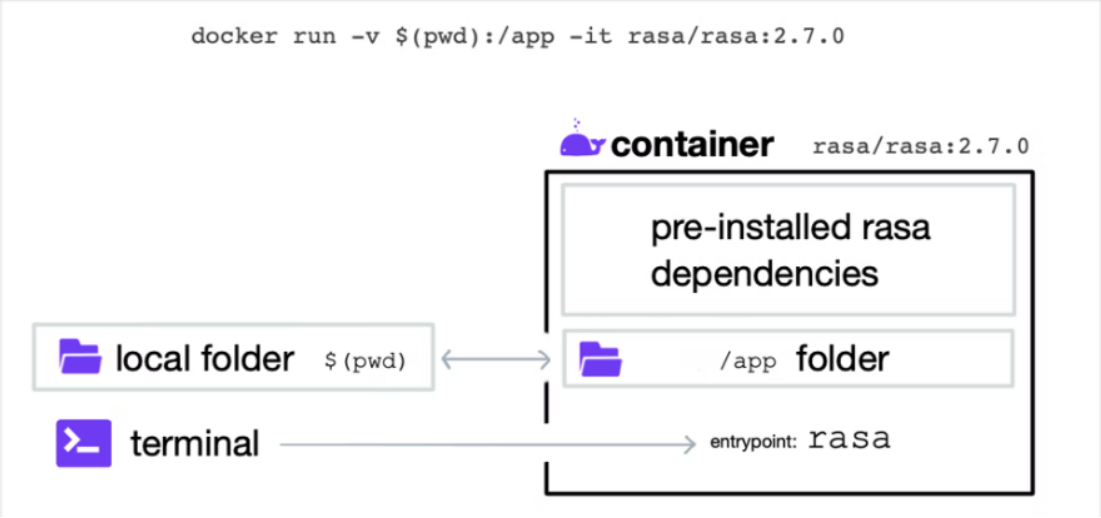
- Custom NER model using SpaCy
- Data annotation
- Load pre-trained SpaCy model
- Converted annotated training data to SPACY file
- Download config file
- Train model with converted dataset
- Load the model and evaluate with inputs
- Could not do both NER and IC on the same model so we tried RASA NLU



MODEL 3:

- NER and IC using RASA NLU
- Set up default RASA environment
- Modify domain.yml by adding a list of intents and entities to it
- Modify nlu.yml by adding examples of intents with various statements/regex
- Highlight entities in the example statements in nlu.yml
- Train NLU model
- Run RASA server on a port of your choosing to send HTTP requests to it (we used Postman to send these requests and receive responses)





To run on Docker,

- Load premade RASA container on Docker
- Run RASA server using Docker

```
(myenv) zain@ZAINS-PC:/mnt/c/Users/zainr/Documents/rasa_nlu_project$ docker run -it -p 8080:8080 -v $(pwd):/app rasa/rasa:2.8.0 run --enable-api --port 8080
2022-07-03 07:17:43 INFO     root  - Starting Rasa server on http://localhost:8080
2022-07-03 07:17:43 INFO     rasa.model  - Loading model models/nlu-20220702-104827.tar.gz...
2022-07-03 07:18:06 INFO     root  - Rasa server is up and running.
```