Errors and Limitations

1) Intent classification with Rasa:

The rasa intent classifier seemed to wrongly classify phrases as one of the three intents even when they are irrelevant. It might be that the examples in the training data are not enough or need revising. Or the config be adjusted to use other types of training models.

One thing I observed is that some phrases may be classified as 'nlu_fallback' beyond the three intents. However, this classification is not consistent, as only some phrases got this output while others were wrongly classified as one of the three intents.

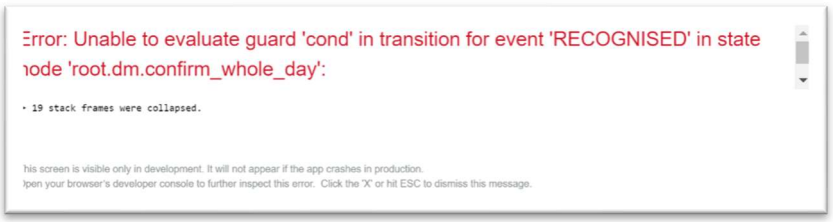
Also, due to initial technical issues, I ended up created more than one Heroku apps, and noticed different behaviours of models. While one model has 'nlu_fallback', I could not recreate the same output using another model.

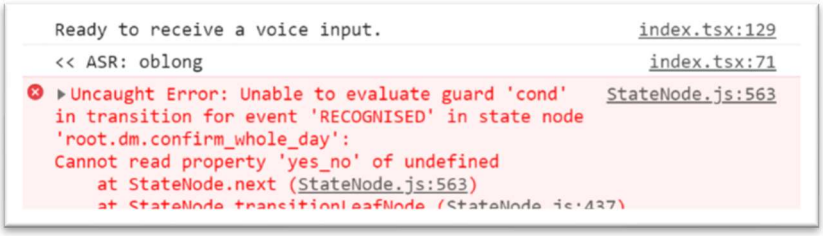
<u>Fix (not perfect and requires finetuning the Rasa model for more accurate classification):</u>

I added a prompting state in the DM in addition to the three target states (appointment/todo/timer). So, if the nluRequest promise outputs 'nlu_fallback', it will go to that state and the user will be informed of what to say. E.g.,

S: Hello! What would you like to do?
U: Hello! *(…classified as nlu_fallback)*
S: Sorry, I cannot do that, but I can make appointments, make a to-do list, or set a timer.

2) Unmatched yes/no phrases caused error:





In my original implementation, when answering a yes/no question, the error above occurs if the ASR outputs something that is not in the predefined grammar ('yes', 'okay', 'no', etc).

Fix:

In my code, the yes-no phrases are evaluated to Booleans, so if the recognized phrase does not evaluate to either true/false, the error occurs. Thus I added *&& (context) => "yes_no" in (yes_or_no[context.recResult] || {})* so that if the recognized phrase is undefined, it will go to the 'nomatch' state.

3) Cannot interrupt/break from the flow of the final state machine:

Although it is the design of the FSM to get things going in a predefined flow, it does not feel smooth in a natural language discourse. For instance, it would feel more natural to be able to make corrections half-way instead of having to start over again (which a lot of contemporary commercial virtual assistants like Google and Siri offer). In this case, I imagine more complicated intent-classification and entity-extraction need to be added.

For example:

S: Are you meeting Mickey Mouse on Friday for the whole day?

U: No, on Saturday / No, with Minnie Mouse / etc

S: Ok… (makes appropriate corrections)

4) People can only be referred to by first names:

In the grammar, each person is an object with their first name as the key. If the user says the full name, the system cannot match it with the person successfully. A solution may be addition more properties to each person object, for example person.name/person.alias/person.fullname, etc. But it can make the condition more complex. Another more viable solution is matching the user input with a database of people, and prompt the user with the results, e.g.,

U: Simpson.

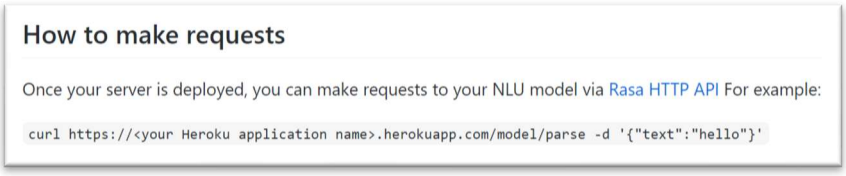
S: (Returns the partially matched results and asks for further response)

I found 2 Simpsons in your contact. Did you mean Lisa Simpson or Homer Simpson?

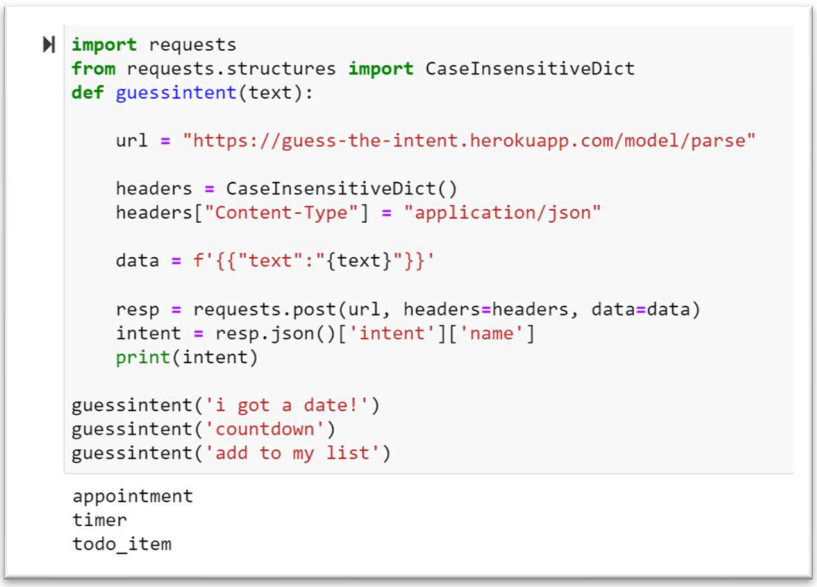
Other Issues

1) Rasa API and CORS:

To access Rasa-Heroku instance, it has to be used in conjunction with cors-anywhere.herokuapp.com and the user has to manually request access to the latter (otherwise we get errors as several students remarked on Discord). But in the instructions on the GitHub page (https://github.com/just-ai/rasa-heroku-template), it says that the result can be accessed using curl:



It worked in the terminal CLI and I wondered if it was possible to access it directly. I made a test function in Python which successfully returned the object and the intent by using the URL. But I am not familiar with JavaScript/TypeScript so I have yet to figure out if/how the same can be done in JS.



```python
import requests
from requests.structures import CaseInsensitiveDict
def guessintent(text):

    url = "https://guess-the-intent.herokuapp.com/model/parse"

    headers = CaseInsensitiveDict()
    headers["Content-Type"] = "application/json"

    data = f'{{"text":"{text}"}}'

    resp = requests.post(url, headers=headers, data=data)
    intent = resp.json()['intent']['name']
    print(intent)

guessintent('i got a date!')
guessintent('countdown')
guessintent('add to my list')
```

```
appointment
timer
todo_item
```

2) Too many states in DM:

There are several states under DM which are only for transitional purposes. For example the state that matches the Rasa-classified intent with a target state. It may be a good idea to put several related states as child states under a parent 'recognise_intent' state for instance. Although I found it difficult to go from a substate to a target state in a higher hierarchy, hence the compromise.