codecademy

Retrieval-Based Chatbots

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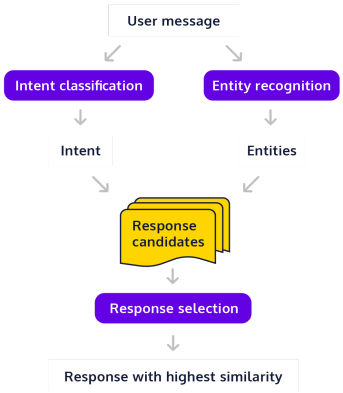
Retrieval-based chatbots are used in closed-domain scenarios and rely on a collection of predefined responses to a user message. A retrieval-based bot completes three main tasks: intent classification, entity recognition, and response selection.



Intent Similarity for Retrieval-Based Chatbots

For retrieval-based chatbots, it is common to use bag-of-words or tf-idf to compute intent similarity.

```
# using tf-idf to identify most likely intent
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.metrics.pairwise import cosine_similarity

vectorizer = TfidfVectorizer()

tfidf_vectors = vectorizer.fit_transform(processed_docs)

cosine_similarities = cosine_similarity(tfidf_vectors[-1], tfidf_vectors)

similar_response_index = cosine_similarities.argsort()[0][-2]

best_response = documents[similar_response_index]
```

Entity Recognition for Retrieval-Based Chatbots

For retrieval-based chatbots, entity recognition can be accomplished using part-of-speech (POS) tagging or word embeddings such as word2vec.

```
import spacy
# load word2vec model
word2vec = spacy.load('en')

# call model on data
tokens = word2vec("wednesday, dog,
flower")
response_category = word2vec("weekday")

output_list = list()
for token in tokens:
    output_list.append(f"{token.text}
{response_category.text}
{token.similarity(response_category.text)
}")

# output:
# wednesday weekday 0.453354920245737
# dog weekday 0.21911001129423147
# flower weekday 0.17118961389940174
```