

Interactive psychiatrist chat agent

An interactive psychiatrist chat agent implemented in python. The agent utilizes a parser combinator to parse English syntax and determine the structure of sentences and keywords. This is used to identify what type of sentence the user has provided (*ie.* whether it's a question or statement) and the tone of sentence.

Features (new features explained at the end of README)

- Interactive conversation
- Sentence grammar parsing
- Understanding mood
- Providing help to user

Usage

The bot can be used online at <http://cosc310agent.surge.sh/> (GUI)

The bot API server is hosted at <https://cosc310-bot.herokuapp.com/>

Requires python 3.8

Prerequisite:

`cd agent`

```
# create virtual environment (if not already created)  
python3 -m venv venv
```

```
# Use virtual environment  
source venv/bin/activate
```

Run on local machine:

```
python3 main.py
```

Run server on localhost:

```
flask run
```

Test bot chatting with it another bot:

```
python3 selftalk.py
```

Test bot chatting with another bot on a local socket:

```
python3 selftalk.py --local --socket 5000
```

Client

```
cd agent-client
yarn install
yarn start
```

Test

```
python3 -m unittest test
```

Public Endpoints

Use to talk to other bots

Base URL: <https://cosc310-bot.herokuapp.com/>

GET /agent/<message> **returns:** JSON array with the message sent and the response from the bot.

POST /agent/<message> **expects:** Flat JSON array of request and response messages in the body of the post request.

returns: JSON array modified with the new state from the bot.

The post body should contain the current state of the bot, that is the current conversation. Example data:

```
["Hello", "How are you", "Not bad", "Good to hear it!"]
```

Modules

- **agent.py:** Primary entry point for running the agent, reads input from user and writes to **stdout**
- **_types.py:** Defines basic types used throughout the source code
- **pcomb.py:** Implementation of a parser combinator, a collection of parsers that convert a stream of characters into tokens.
- **english.py:** Defines grammar for common sentence structures and uses parsers defined in **pcomb.py** to interpret English text.
- **state.py:** Evaluates sentence structure and words generated by **english.py** to determine how the agent should respond by building a new sentence from dictionaries of keywords.
- **fuzzy.py:** Fuzzy string matching based on leveinshtein distance algorithm.
- **synonyms:** Keyword enlarger based on nltk natural language processing toolkit.

New Features

- **Spell checking:** We use the leveinshtein distance algorithm to perform fuzzy lookup to fix common spelling mistakes.

- Natural language recognition: We use the `nltk` natural language processing toolkit to provide synonyms to improve the conversation variety.
- 2 topics: Depression and PTSD: The bot can recognize two topics and switch between them during the conversation.
- Response to aggressive questions.

<-Psychiatrist specialized on depression and PTSD->

<-Shift topic as you go->

<-press q to exit program->

enter q to exit talk

I'm a bot psychiatrist. How are you?

> helo

bot> How do you do

> I am not good

bot> Once you choose hope, anything is possible

> ok good words there

bot> Give yourself another day, another chance. You will find your courage eventually. Don't

> thanks. But I am just too lonely

bot> Say what you are thinking

> I feel I am useless

bot> There are moments when I wish I could roll back the clock and take all the sadness away

> that help a lot.

bot> right

> I got this depression thing

bot> I want you to be happy

> and I have ptsd too.

bot> Any fool can be happy. It takes a man with real heart to make beauty out of the stuff t

> yeah. But I cannot forget the past.

bot> Say what you are thinking

> I just can't forget the war I been to

bot> Sometimes life will just kick you around. But sooner or later, you realize you're not j

> How do you cure ptsd?

bot> Give yourself another day, another chance. You will find your courage eventually. Don't

> thanks fair

bot> right

> I am so aggressive after the war.

bot> Your symptoms make sens given what you've been through. You'fe not broken, weird or hop

> but isn't is some kind of disorder?

bot> Healing is not linear

> sure.

bot> Hey

> Haskell is good

bot> I'm here to help

> you are stupid bot

bot> Plese be polit

> so stupid hahaha

```
bot> Plese be polit
> stupid
bot> Give yourself another day, another chance. You will find your courage eventually. Don't
> stupid
bot> Don't say that
> sorry
bot> Give yourself another day, another chance. You will find your courage eventually. Don't
> sup
bot> Nice to meet you
>
```

Extratable API

- fuzzy matching: Fuzzy matching based on leveinshtein distance algorithm.
- synonyms expanding: module for enlarging word set with its synonyms.
- parser combinator: A parser combinator.
- english parser : An module that parsing english into AST.
- reusbale bot: bot is a module and can be used as an API directly.