

# 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 levenstein distance algorithm.
- `synonyms` : Keyword enlarger based on nltk natural language processing toolkit.

## New Features

---

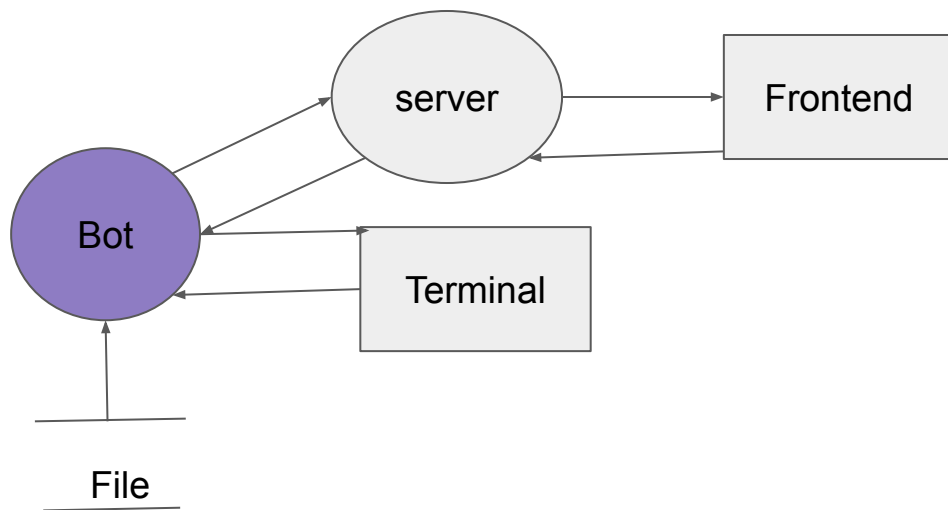
- Spell checking: We use the levenstein distance algorithm to perform fuzzy lookup to fix common spelling mistakes.
- Natural language recognition: We use the `nltk` natural language processing toolkit to provide synonyms to improve the conversation variety.
- 2 topics: Depression and PTSD: The bot can recognize two topics and switch between them during the conversation.
- Response to aggressive questions.

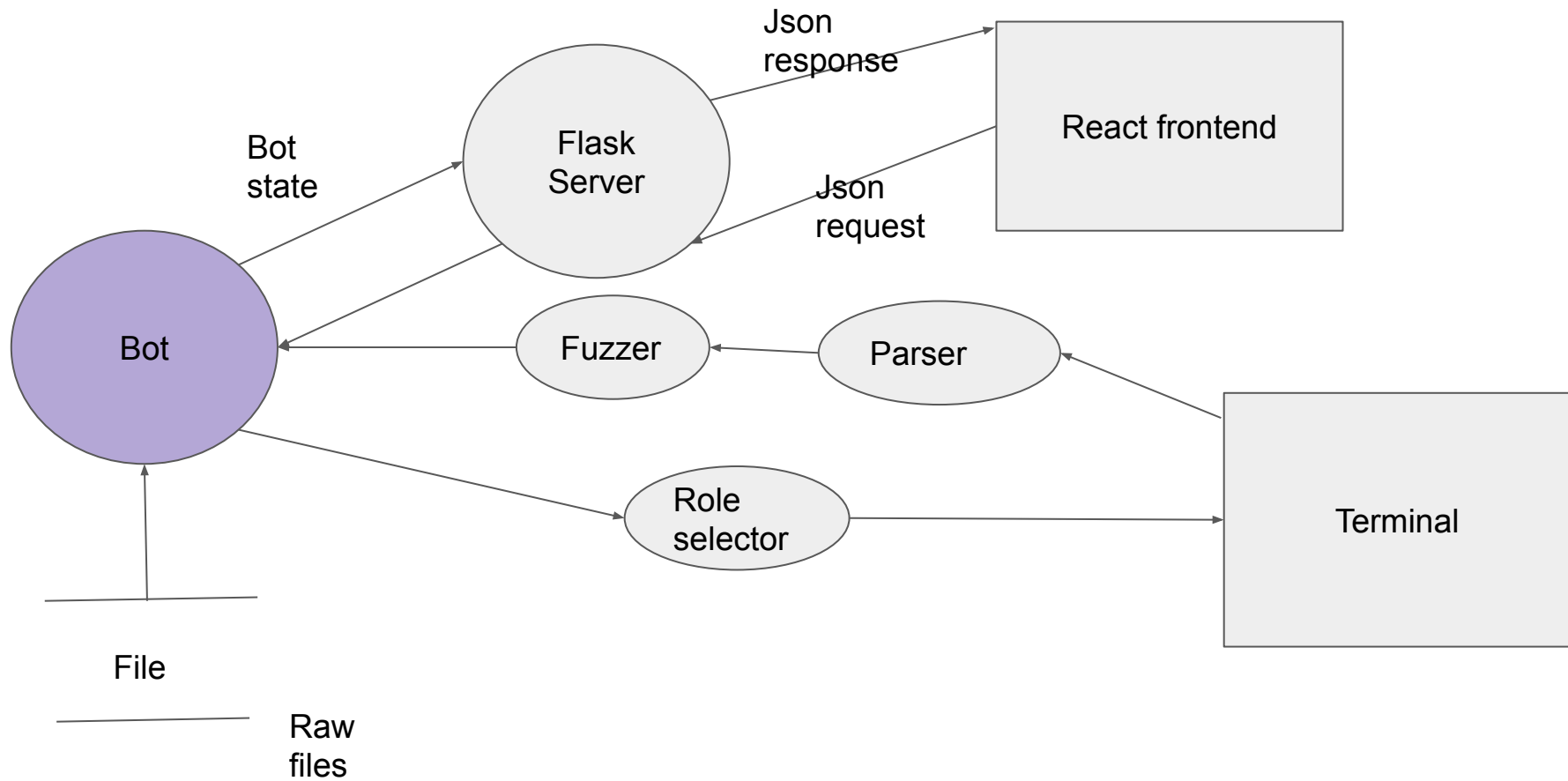
<-Psychiatrist specialized on depression and PTSD->  
<-Shift topic as you go->  
<-press q to exit program->  
enter q to exit talk  
I'm a bot psychiatrist. How are you?  
> helo  
bot> How do you do  
> I am not good  
bot> Once you choose hope, anything is possible  
> ok good words there  
bot> Give yourself another day, another chance. You will find your courage eventually.  
Don't give up on yourself just yet  
> 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, but I have the feeling that if I did, the joy would be gone as well.  
> 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 that makes us weep  
> yeah. But I cannot forget the past.  
bot> Say what you are thinking  
> I just cann't forget the war I been to  
bot> Sometimes life will just kick you around. But sooner or later, you realize you're  
not just a survior, and you're stronger thant anything life throws your way  
> How do you cure ptsd?  
bot> Give yourself another day, another chance. You will find your courage eventually.  
Don't give up on yourself just yet  
> 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 hopeless. You are worthy of love and belonging.  
> 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 give up on yourself just yet  
> stupid  
bot> Don't say that  
> sorry  
bot> Give yourself another day, another chance. You will find your courage eventually.  
Don't give up on yourself just yet  
> 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.





### List of limitation

- Can only respond to several topics e.g. depression & PTSD
- Do not continue with the previous respond
- Limit words recognized
- Do not made decision for user
- Agent have no emotions
- Only have repetitive respond

### Psych Agent

Hello I'm Psych Agent Bot and I'm here to listen to you

hi

hi

Hi there

how are you

Nice to meet you

### Psych Agent

can you cheer me up

absolutely

i feel so upset today

You're not alone in this

my girlfriend just broke up with me

I want you to be happy

Send

### Psych Agent

we are together for almost 4 year

If today all you did was hold yourself together, I'm proud of you

i don't want to be alone

I'm listening

do i need to find another girlfriend

correct

### Psych Agent

i feel so depressed

Any fool can be happy. It takes a man with real heart to make beauty out of the stuff that makes us weep

can you cheer me up

yes

you are so stupid

Don't say that

## Psych Agent

i got this depression thing

We are on your side no matter what

and i have ptsd too.

There is hope, even when your brain tells you there isn't

yeah. but i cannot forget the past.

You're not alone in this

## Psych Agent

i am so aggressive after the war.

What happened doesn't define you

but isn't is some kind of disorder

I want you to be happy

you are stupid bot

Don't you dare

Dialogues that agent cannot handle:

## Psych Agent

can you help me to do one assignment

My passion is cheer my patient up

can you help me to buy an apple

Healing is not linear

Send

## Psych Agent

i want to skip class

be brave. Everything will be fine as long as you are well.

can you climb a tree

Give yourself another day, another chance. You will find your courage eventually. Don't give up on yourself just yet

Send