

Interactive psychiatrist chat agent

on: https://github.com/Zhaoyang98/COSC_310_A2 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

Hi there

Nice to meet you

hi

hi

how are you

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

Psych Agent

absolutely

You're not alone in this

I want you to be happy

can you cheer me up

i feel so upset today

my girlfriend just broke up with me

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

A chat interface titled "Psych Agent" with a vertical scrollbar on the right. The conversation consists of the following messages:

- User (blue bubble): i got this depression thing
- Agent (white bubble): We are on your side no matter what
- User (blue bubble): and i have ptsd too.
- Agent (white bubble): There is hope, even when your brain tells you there isn't
- User (blue bubble): yeah. but i cannot forget the past.
- Agent (white bubble): You're not alone in this

At the bottom, there is a text input field and a blue "Send" button.

Psych Agent

A chat interface titled "Psych Agent" with a vertical scrollbar on the right. The conversation consists of the following messages:

- User (blue bubble): i am so aggressive after the war.
- Agent (white bubble): What happened doesn't define you
- User (blue bubble): but isn't is some kind of disorder
- Agent (white bubble): I want you to be happy
- User (blue bubble): you are stupid bot
- Agent (white bubble): Don't you dare

At the bottom, there is a text input field and a blue "Send" button.

Dialogues that agent cannot handle:

Psych Agent

A chat interface titled "Psych Agent" with a vertical scrollbar on the right. The conversation consists of the following messages:

- User (blue bubble): can you help me to do one assignment
- Agent (white bubble): My passion is cheer my patient up
- User (blue bubble): can you help me to buy an apple
- Agent (white bubble): Healing is not linear

At the bottom, there is a text input field and a blue "Send" button.

Psych Agent

A chat interface titled "Psych Agent" with a vertical scrollbar on the right. The conversation consists of the following messages:

- User (blue bubble): i want to skip class
- Agent (white bubble): be brave. Everything will be fine as long as you are well.
- User (blue bubble): can you climb a tree
- Agent (white bubble): Give yourself another day, another chance. You will find your courage eventually. Don't give up on yourself just yet

At the bottom, there is a text input field and a blue "Send" button.



