

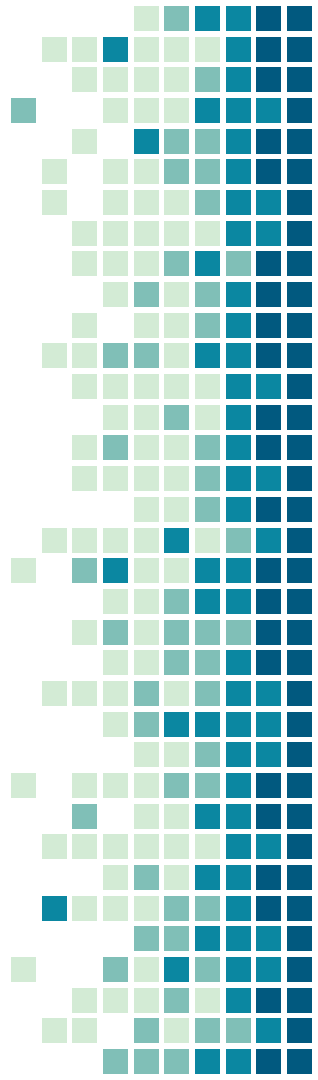
# Markov Model Chatbot

Hannah Kerr



# What is a Chatbot?

- Computer program that simulates or conducts a conversation
  - Rule or pattern based
  - Corpus based



# Task Oriented Chatbots

- Siri, Alexa, Google Assistant, etc.
- Find restaurants, book flights, make reservations
- Typically only a few 'turns'



# Conversational Chatbots

- Attempt to understand and mimic human conversation
- Typically more 'turns'



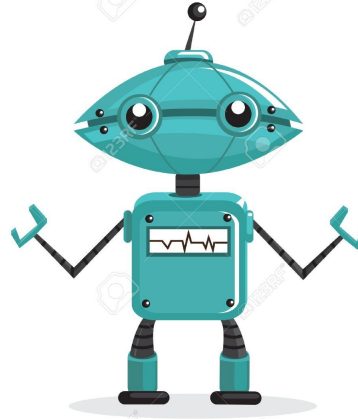
# Applications of Chatbots

- 'Smart' assistants
- Customer service
- Company platforms and services
- AI and ML research and development



# Meet BotBuddy!

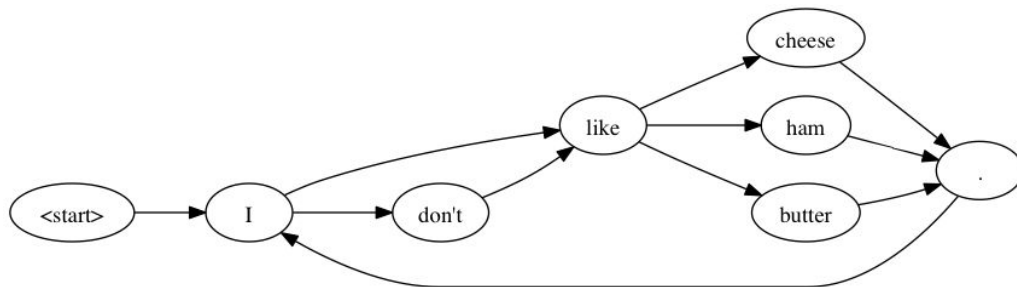
- Markov model chatbot
- “Conversational”
- Corpus based - Cornell movie dialogs
  - Also uses reg ex patterns
- Tells knock knock jokes!



# Methods

## Markov chains

- Model a sequence of events where transition from one state to another depends on probability of the previous state



# Methods

## TF-IDF and Cosine Similarity

- Term-document frequencies to create word vectors
- The cosine of the angle of two vectors measures similarity
- Uses scikit-learn and code provided by Dr. Havill





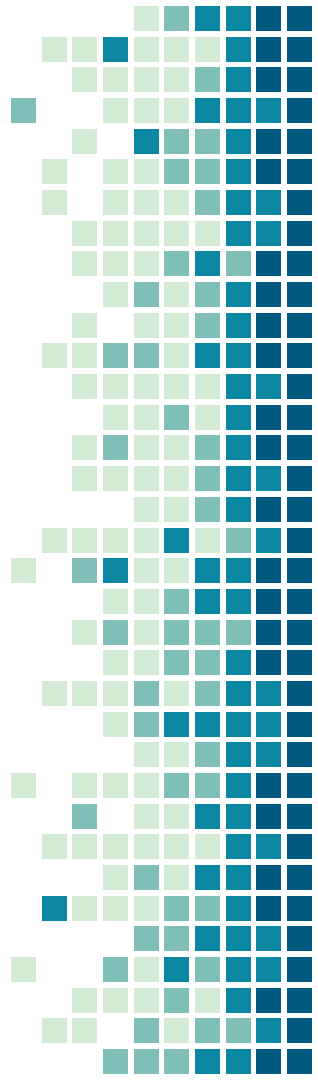
# Methods

## P.O.S. tagging

- Parse user input to extract important parts of speech.
- Use as seed for Markov Chain Model

## RegEx

Rules based on pattern matching



“

What is your favorite color?

What color is it?

whichever color is your  
favorite

color blind.

that sucks. Do you like music?

The music surrounds you like to  
discuss my future as some form  
of happiness

“

We must help them.

Please help me.

help me!!!!

Ned is wrong with me  
along too well to tell you  
what happend.

Can you help me with my  
homework

yes, i need help

you are supposed to help me

what is wrong?

“

boats are female, old building  
and loans?

how old are you?

can bots take out loans?

the loans give the orders

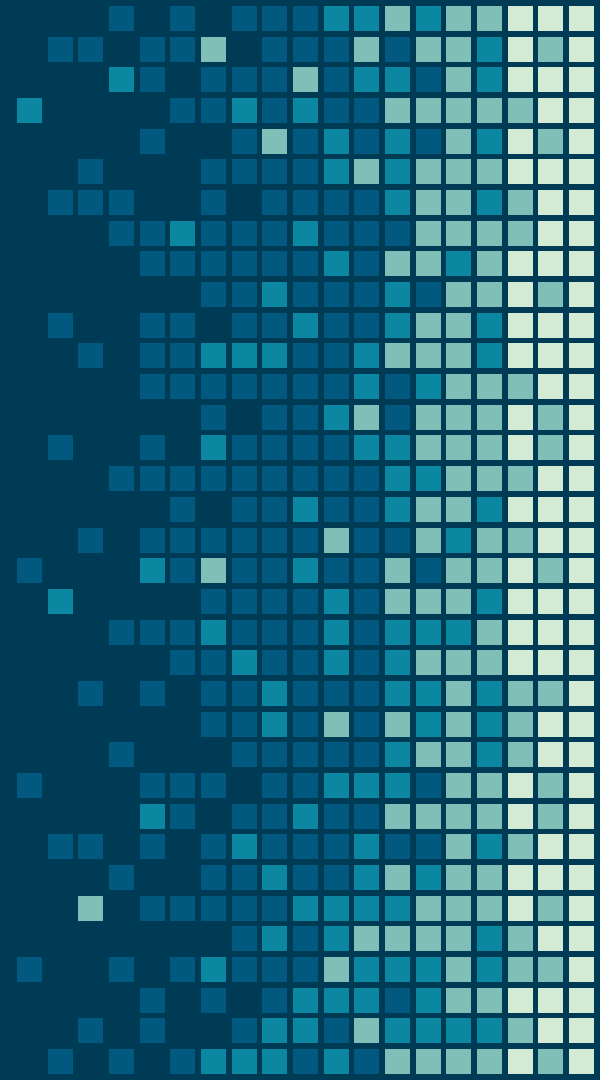
what are the orders

no orders.

do you have free will then

things have not much you fear  
them until they rant the place is  
everything!!... you bet the ponies

Let's chat with  
BotBuddy!



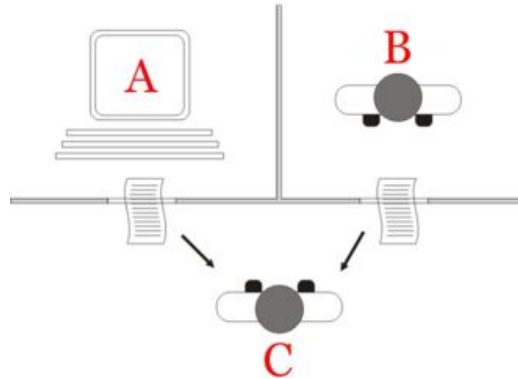
# Evaluation

- Bots are evaluated on how well they perform and fulfill their individual requirements
- Conversational/AI bots are put up to the Turing Test



# The Turing Test

The Turing Test was developed by Alan Turing in 1950. It tests the ability of a machine to exhibit “intelligent behavior” that is indistinguishable from that of a human.



# Does BotBuddy pass the Turing Test?



To date no AI has passed the Turing Test, though many have come close.



# Is BotBuddy entertaining?



# Some Thoughts

- Obviously chatbots can be much more complex
- Chatbots will only grow in popularity and use
- Eventually a bot will beat the Turing Test



Thank you!

