Ron Swanson
@RealRonSwanson

i am i am extremely happy because i dont believe in government

11:06 AM · Sep 14, 2019 · Twitter for iPhone

66 Retweets **2** Quote Tweets **265** Likes

Leslie Knope
@RealLeslieKnope

i kind of support of corn trees

5:20 PM · Arl 17, 2021 · Twitter for iPhone

92 Retweets **2** Quote Tweets **467** Likes

Tom Haverford ✓
@NOTazizansari

i need you a raccoon

2:11 PM · Mar 19, 2019 · Twitter Web Client

8 Retweets **1** Quote Tweet **91** Likes

Significance

- We LOVE Parks and Recreation
- Other people also love Parks and Recreation
- The series ended but we want more
- We wanted to explore TV/Movie natural language data

Models

Model 1

Statistical Model

Model 2

RNN

Data

Character	Line
Abigail	We should let the boys in.
Abigail	Isn't it like Brown vs. The Board of Education?
Abigail	Separate but equal is never really equal.
Adam Vinatieri	How are you going to run in those?
Alexa Softcastle	Alexa Softcastle, Pawnee Sun.
Alexa Softcastle	Can I ask you a few questions?
Alexa Softcastle	Leslie Knope?

Leslie Knope	But now things have changed.
Leslie Knope	People need our help.
Leslie Knope	And it feels good to be needed.
Leslie Knope	Could you put your arms to your side?
Leslie Knope	And that might help you slide down a little easier.
Leslie Knope	Do you want to come this way?

- All Parks and Recreation Scripts (Kaggle)

- Characters we focus on

  - Leslie Knope

  - Ron Swanson

  - Tom Haverford

  - April Ludgate

  - Chris Traeger

  - Perd Hapley

  - Jean-Ralphio Saperstein

Cleaned Data

Leslie Knope Training Data

```
<s> were im not making any kind of statement </s>
<s> so it doesnt matter </s>
<s> tonight i am throwing ben his dream birthday party a roller skating bash with an early
90s theme </s>
<s> they asked me about the sewage eruption in ramsett park right after ron emailed me about
it </s>
<s> you know allison would become april and then april would become me </s>
<s> ive always dreamed of you </s>
<s> whats the surprise </s>
<s> in fact our date in pawnee is gonna blow indianapolis out of the water </s>
<s> thats the covergirl slogan </s>
<s> sir you dont pay your income tax </s>
<s> how is someone gonna be able to get through that door </s>
<s> we cant both be out of a job </s>
<s> pawnee is an incredibly superstitious town a travelling magician came through one time
and he pulled a rabbit out of a hat and the mob burned him at the stake for being a witch </
s>
<s> now im going to go out there and im going to announce the relaunch and im going to
muddle through this thing as best i can </s>
<s> the devil knows where youre hiding </s>
<s> the pie mary is a southern indiana tradition where congressional candidates wives face
off in a pie baking contest </s>
<s> actually i was thinking </s>
<s> pawnee is celebrating its 200th anniversary and the newport family has been here since
day one </s>
<s> well you know what </s>
```

- Cleaned and formatted data for each character
  - Removed punctuation
  - Added <s>, </s>
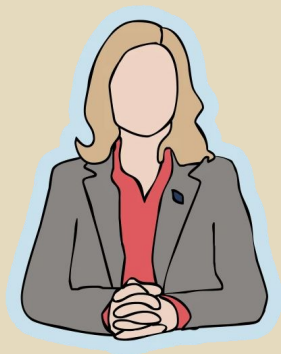- Shuffled sentences
- Separated into train (75%) and test (25%) sets

Statistical Language Model

- Based on probabilities of words appearing
- Four-gram model
  - Used <s>, </s> to represent the beginning and end of sentences (3 before and 3 after for four-gram)
- Incorporated <UNK> for words that were only seen once in training
- Uses Laplace Smoothing
- Generates sentences using Shannon's Method

Statistical Model Results: Leslie Knope

"Now if youll excuse me im about endorse ten beers into my mouth cause this has been a question <UNK> about when my relationship with ben wyatt ended"

"Youve never had a budget shortage"

"And thats why this is a dream come true"

"This is a little fun i was having you know"

Average Probability: 1.21173e-07

Standard Deviation: 6.71017e-07

Statistical Model Results: Jean-Ralphio Saperstein

"Makes your <UNK> look like a <UNK> of your <UNK> <UNK> or my <UNK> <UNK> <UNK> with <UNK>"

"My question to you is how you making that paper"

"I dont know where the <UNK> is but when you <UNK>"

Average Probability: 2.69772e-05

Standard Deviation: 9.17305e-05

THE WOOOOOOOORST

RNN Language Model

- 3 Layers
    - Embedding: 200 units
    - Long short-term memory: 400 units
    - Softmax
- Input / Label:
    - X: [w1], Y: w2
    - X: [w1, w2], Y: w3
    - X: [w1, w2, ..., wN-1], Y: wN
    - Sequences pre-padded with zeros: [0, 0, 0, 0, 0, w1, w2]
- 1 model per character trained for 25 epochs

RNN Results: Leslie Knope

"You know i literally bring you up behind the stage ron"

"Thats mr funny noodle"

"well speaking of heat goddesses wait what we are on the crowd"

"i think is my vest told me or you are"

Model Accuracy: 19.7%

RNN Results: Jean-Ralphio Saperstein

"Who gotta straight off tajikistan"

"I dont just be at the dies"

"It gonna be your tommy same it from is with this moussetache"

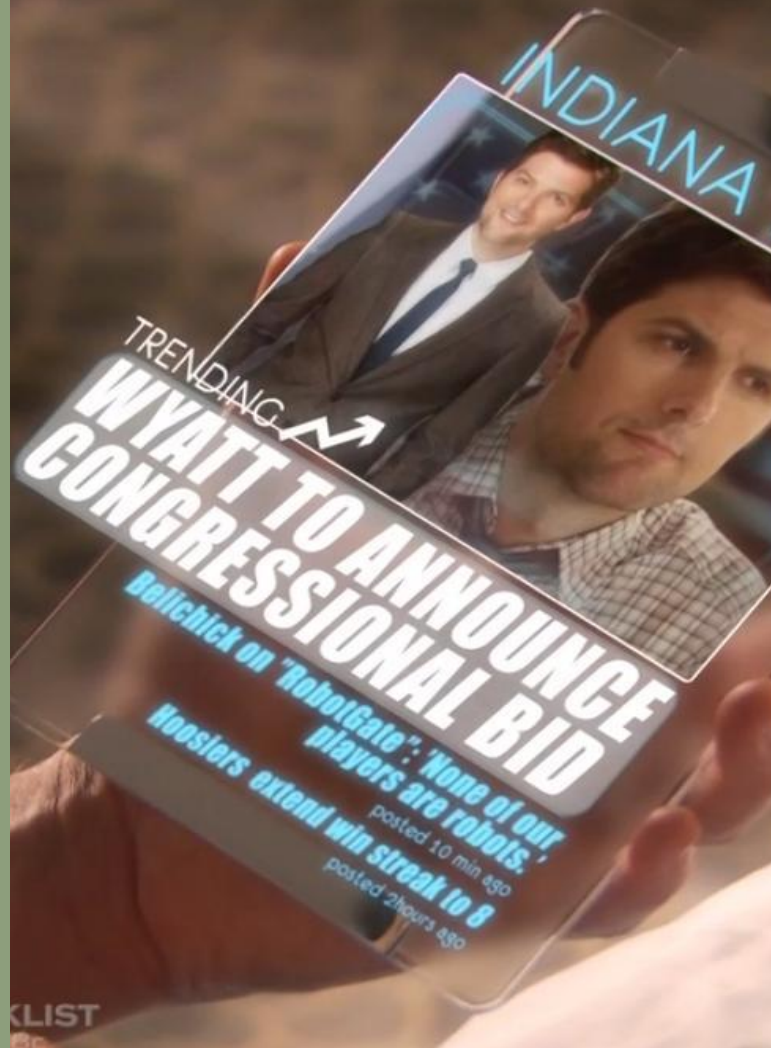Model Accuracy: 14.9%

In the Future...

Tweaking parameters
>   Statistical: n-gram size
>   RNN: epochs, hidden dimensions

Other Shows and Movies

Tweets -> Full Scripts

Thank you!

Ron Swanson @RealRonSwanson · Jan 21, 2018

these flutes are available to a grinding porterhouse

💬 1   🔁 195   ♡ 598

Tom Haverford
@RealTomHFord

i have no interest in there im pretty cozy

10:48 AM · Jan 2, 2018 · Twitter for iPhone

Chris Traeger ✔
@IUsedToBeTheCityManagerOfPawnee

hey personally reason to literally the fan of going

3:07 PM · Mar 6, 2021 · Instagram

April Ludgate @SatansN1ece666 · May 4, 2020

then i was his nice because it is mice

💬 1   🔁 1   ♡ 5

Perd Hapley @ItIsPerdHapley · Apr 4

the story of a story of where love reporting band actual its brandi harvest glass

💬   🔁   ♡   ⬆

RON APPROVES