




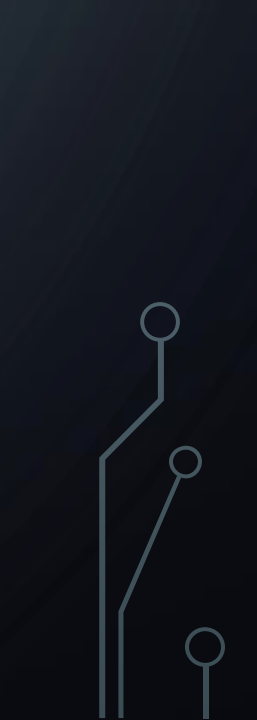
ROBOTIC AESTHETICS

A TWITTER ROBOT BY CHARLES MACKAY

[@ROBOTAESTHETIC1](https://twitter.com/ROBOTAESTHETIC1)



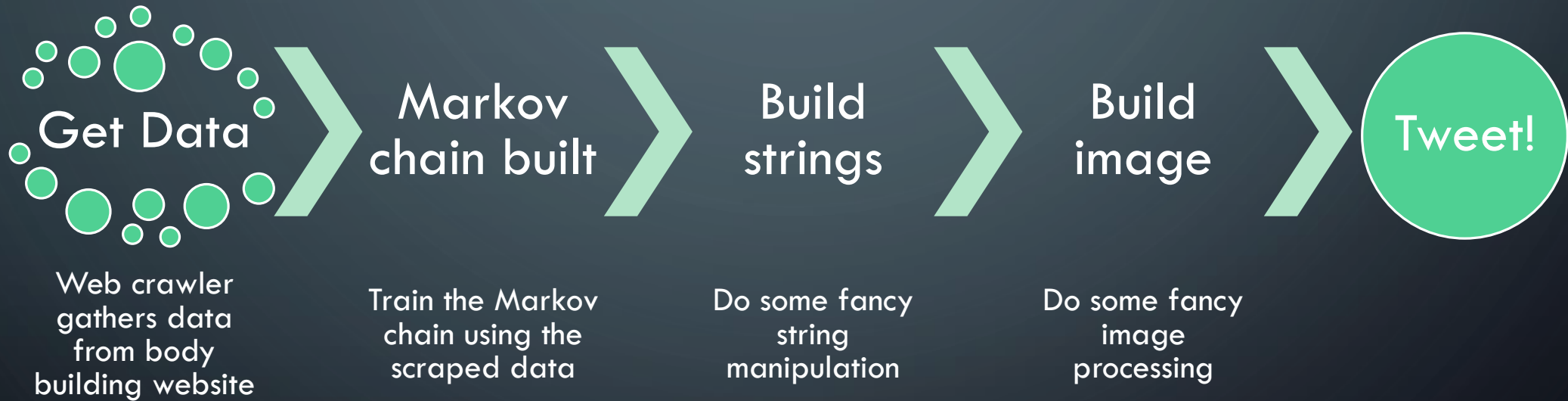
OUTLINE

- Abstract
 - Flow chart
 - Web Crawler
 - Markov
 - Tweet
 - Demo
 - Libs used
- 
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ABSTRACT

- This creative robot will generate a new exercise of the day “EotD” every 24 hours. It works by scraping bodybuilding.com for every exercise available. It downloads all of the exercise descriptions as text, grouping them by muscle, title, and step number. A Markov chain is built and new text can be generated. The exercise description is overlaid over an image in order to bypass the 140 character limit, and also to look much cooler. The status is tweeted, using the twitter API, and is repeated every 24 hours.

FLOW CHART



WEB CRAWLER

- The web crawler is needed in order to provide input text for the Markov chain.
- I crawled the index of all exercises, and navigated to each page, and downloaded the exercise description by looking div class “guideContent” and downloading each of the tag as the steps 1,2,3,4.
- I then created data structures based off of each muscle group and categorized all of the workouts
- I saved each step as \$musclename\$stepno.txt
- I separately saved the workout names as a separate file in order to generate new exercise names

SAMPLE SIZE

Total of 659KB of text was parsed
corresponding to the exercises on the right

learning: 57 exercises for Biceps
learning: 142 exercises for Shoulders
learning: 28 exercises for Calves
learning: 9 exercises for Neck
learning: 47 exercises for Lats
learning: 79 exercises for Triceps
learning: 91 exercises for Hamstrings
learning: 13 exercises for Adductors
learning: 210 exercises for Quadriceps
learning: 108 exercises for Chest
learning: 45 exercises for Middle Back
learning: 12 exercises for Abductors
learning: 30 exercises for Lower Back
learning: 26 exercises for Glutes
learning: 28 exercises for Forearms
learning: 16 exercises for Traps

MARKOV - MARKOVIFY

- My project uses markovify, “a simple, extensible Markov chain generator”.
- It is the primary source of text generation to create new exercises.
- The Markov chain works by undergoing transitions from one state to another on a state space, with the probability distribution of the next state depending only on the current state and not on the sequence of events that preceded it. [Wikipedia]
- By analyzing the word frequency of the text, we can build a Markov model by with the weights to the next state being the probability that a certain word succeeds the current state's word

CREATING A STATUS

- After the Markov chain architecture is built, an exercise description is created as follows:
 1. Pick a randomly selected muscle group from the list of available muscles
 2. build 4 Markov chains by using \$chosen_muscle1,2,3,4 .txt as inputs
 3. Randomly generate a new exercise name by putting a mix of titles together
 4. Have the Markov models generate a short sentence for each step
 5. Using the Pillow python module, take a background image, and place the exercise description text over the image, and save the image.

TWEETING A STATUS

- Using the twitter module for python, Tweepy, we are easily able to tweet a status.
- After configuring the twitter developer settings, we can access our API keys
- Using a simple function `update_with_media`, we are able to tweet our picture along with the exercise name.
- Repeat every 24 hours or however often you want.

FAVORITE EXAMPLES

EotD: Physioball Glute Cable

Muscles Worked: Glutes

- 1) Begin seated on the floor and with the arms on top of a squat rack or the top of an exercise ball.
- 2) Breathe out as you can.
- 3) Explode up with your feet flat on the opposite leg.
- 4) Now slowly bring your working leg forward, resisting the pull of the bent leg and the hip flexor of the straight leg.



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EotD: Physioball Glute Cable



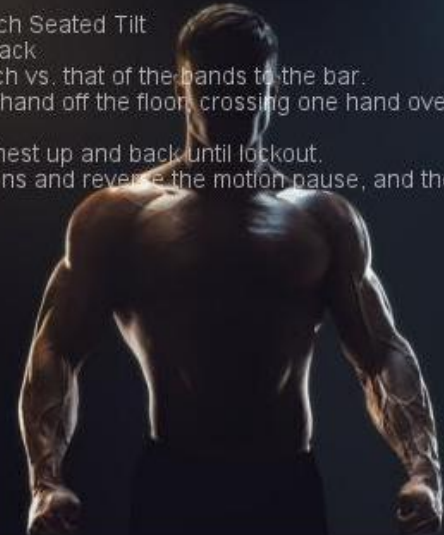
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EotD: Back Pulls Flat-Bench Seated Tilt

Muscles Worked: Lower Back

- 1) Lie prone on a flat bench vs. that of the bands to the bar.
- 2) Once secured, lift your hand off the floor, crossing one hand over to tap your partner's hand.
- 3) Be sure to keep your chest up and back until lockout.
- 4) Pause just above the pins and reverse the motion pause, and then return to the starting position.



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EotD: Back Pulls Flat-Bench Seated Tilt



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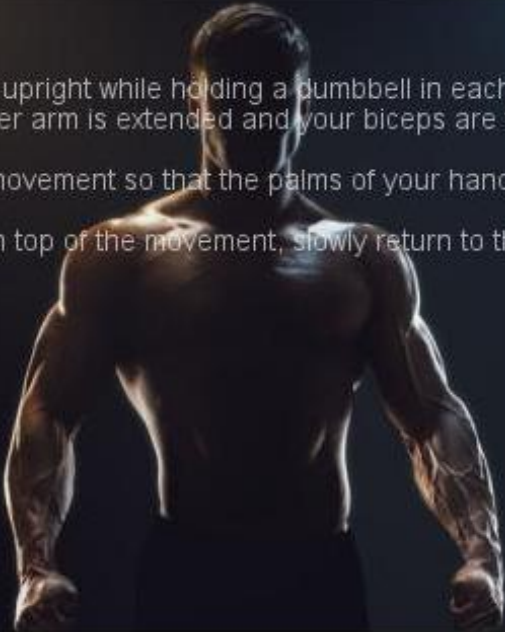


USING A LARGER MARKOV STATE SIZE

EotD: Rope Curl Hammer

Muscles Worked: Biceps

- 1) Stand up with your torso upright while holding a dumbbell in each hand at arm's length.
- 2) Make sure that your upper arm is extended and your biceps are fully contracted and the bar is at shoulder level.
- 3) Pause at the top of the movement so that the palms of your hands face forward at the end of the movement.
- 4) Now extend your arms on top of the movement, slowly return to the starting position.



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EotD: Rope Curl Hammer [#workout](#) [#fitness](#) [#wotd](#) [#eotd](#) [#Biceps](#)



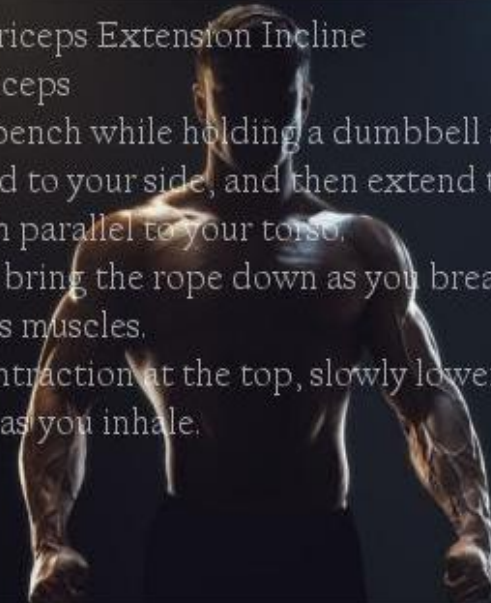
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EotD: Stretch Sled Triceps Extension Incline

Muscles Worked: Triceps

- 1) Lie back on a flat bench while holding a dumbbell at arms length.
- 2) Keep the arm fixed to your side, and then extend the arm over your head so that the upper arm parallel to your torso.
- 3) Using the triceps, bring the rope down as you breathe out and push the bar using your triceps muscles.
- 4) After a second contraction at the top, slowly lower the weight back to the starting position as you inhale.



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EotD: Stretch Sled Triceps Extension Incline [#workout](#) [#fitness](#) [#wotd](#) [#eotd](#) [#Triceps](#)



FUNNY ONE



IMPROVEMENTS

- The title generation (name of the exercise) is simply a random number passed into an index of titles. This results in some amusing names, but nonetheless it would be better if the title was sorted by adjective, noun, verb
- I attempted to use the NLTK (natural language toolkit) module, but I could not get it to do simple identification of words.
- I downloaded the Stanford NLE tagging module, but ran into java errors.
- I plan on figuring out these bugs, and improving the title generation when I have more time.
- I also would like to see if I could improve the Markov chain model, and setup more rules on how sentences are formed to avoid any redundancies or non-sense.
- I also would want to make the text overlay look a bit cleaner, and more eye catching

CONCLUSION

- I am happy with the results. The output text seems very close to an actual workout, and might actually be a healthy exercise
- I have improved the text overlay, and am pleased with the new font
- Once I get my linux system up, I might get this running on a cron job so it will tweet every 24 hours.

LIBS USED

- Status generation
 - Markovify
 - Pillow
 - Tweepy
 - NLTK, Stanford NLE
- Web Crawler
 - Urllib2
 - BeautifulSoup 4
 - Re (regex)
- Standard python libs
 - Time, textwrap, sys, random, math