

AI Horoscopes



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Concept

In this web age of social media and memes and alternate identities, humans have gained an ability to exist within two worlds at once. The immense amount of faceless interactions in the digital world have led to our living in a state that lacks a quality of depth and introspection. Conventionally, humans have pursued depth primarily by finding meaning in life through religion. Although recent generations have broken out of more traditional constructs and belief systems, we still use heuristics to shape our values and understand how the world works.

A trendy belief system that is met with skepticism, yet resonates with a surprising number of individuals – especially in the United States, is horoscopes. The ancient astrological study of personalities with respect to the alignment of stars has turned into a daily fortune teller of sorts, instructing people what events lie in their destiny and how to best handle them. While many people read their daily horoscopes, they seldom take them to heart. A primary reason for this rejection is astrology's lack of scientific reasoning. As a group, we have also come to wonder how much truth there is behind horoscopes.

In this project, we investigate the reproducibility of horoscopes. The task that we are faced with is modeling a large amount of daily, weekly, and monthly horoscope data to generate what we hope to be a fun or eye-opening series of fortunes. These oracles will either be universally relatable and allow us to break down false constructs between ourselves, or give us the means to understand ourselves on a deeper level. At the end of it, we believe that anything that spurs self-introspection is incredibly valuable. Our ultimate motivation is to advocate for this form of thought in our audience.

Process + Techniques

Data Collection (Sophia)

We used BeautifulSoup to scrape roughly 40,000 lines of data from a daily horoscope archive¹ dating back to August 15, 2009. Each page of the site contains a horoscope for each of the twelve astrological signs. The figure below is an example of the Aries horoscope for March 29, 2019:



- Aries - March 29, 2019

A certain person who does things their way and refuses to be bound by rules or restrictions could inspire you to break free in some way. However, their attitude and approaches might work for them but could bring a world of complications for you if you try to emulate them. Stick with what you know works or is above-board. This person's luck could run out sooner than they think. [Ask 1 free question to a Psychic](#)

Our scraper collected the date, sign, and horoscope of each entry. The data contains a somewhat limited vocabulary set in comparison to the large corpus, which is beneficial for the model to generalize to the dataset.

¹ <https://sagittarius.com/archive/>

RNN and Sequence-to-Sequence Learning Model (Jenn)

We used code³ available on the Art_ML AWS. We wanted to experiment on the RNN model and Sequence-to-Sequence model to determine which would provide a better result. When using the RNN, we trained the model on a character level and tuned the parameters. The results got better with more training but were still poor. There were unidentifiable misspelled words, as well as incomplete words that even a text corrector code⁴ couldn't fix.

We moved on to the Sequence-to-Sequence modeling for text generation. This model is much more efficient in generating text based on the given input. We went for more of a word2seq approach, inputting the sign and outputting the horoscope text.

We played around with two models: **one with one-hot vectors and one with learning embeddings**. Due to computation time, we trained a reduced dataset (100 of each signs). There weren't any spelling mistakes, but due to the lack of vocabulary, there were a lot of repetitive words to match the approximate length of the text. Comparatively, the sequence to sequence modeling showed better results.

Conditional RNN-Sequence Modeling (Sophia)

We used code² available for lyric generation conditioned on artist to do a character-level sequence generation using Pytorch. The model uses Python to create a dictionary of all printable characters, with each character represented in a one-hot-encoded tensor. The model then generates sentences by sampling character by character, where we predict the next letter conditional on all of the previous letters, similarly to a Markov chain. The model uses a recurrent neural network (RNN), applicable to our task because it makes use of sequential information and uses output from the previous computation to compute the next character. In a way, RNNs contain contextual information because they store memory of what was computed before.

We tuned the parameters `batch_size` and `num_workers`, and found that a batch size of 200 and 4 workers perform best. Due to the lengthy computation time, we tested what worked best for 3 iterations and adjusted accordingly.

The conditional RNN sequence model is conditioned on two parts: the horoscope sign and the input sequence. As it made sense to generate sentences with "Today," to start off the fortune of the day, we set the start sequence as "Today,". We also set the character length to the average of the character lengths.

We also tuned the **temperature parameter**, used to control the randomness. When temperature is higher, we generate a higher volume of random horoscopes. When temperature is lower, we generate sentences that are more similar to sentences that we've seen before in our dataset. We did not want temperature to be too low, as we wanted our generated text to be somewhat unique – however, we also refrained from producing nonsensical gibberish. Given this, we decided that the optimal temperature for text that makes sense is 0.3.

² <http://warmingwinds.github.io/pytorch/rmns/2018/01/27/learning-to-generate-lyrics-and-music-with-recurrent-neural-networks/>

³ https://github.com/keras-team/keras/blob/master/examples/lstm_text_generation.py

⁴ <https://github.com/atpaino/deep-text-corrector>

Results

Today, if you wish, consider how you're being pushed to do so. The cosmos is presenting you with a breakthrough and the sky insists a need exists to put your foot down and accept that you don't need to be more flexible where you can accelerate a process that you will benefit from doing so. "Do you really want to ensure that you are right to do so, then you will see how instilled you are to be proved right. "Deep it and you'll

Aries

Today, you might not be able to see a situation that you believe to be a sense of confidence and a new way of doing something that will bring a much better result. "The sky is helping you to see what you can do is be willing to let go of something that has been a bone of contention. "Do you think it will be the best possible result? "not it was. "Like now are the last time you feel in your world now. "Do your heels is a bit lo

Taurus

Today, you can be certain that you are right to be prepared to do so. "The sky speaks now of a few people who are considering an issue that you can accept their way to you. "Deep with a burden, you can be certain they can be supportive. "Lose the way it is to you. "Do your heart is trying to make a point. "Dearly won't fail you. "Deep it will be a bit longer. "The cosmos is trying to continue to be supportive of an issue that

Gemini

Today, you can be certain it will be required to accept a situation that you can gain from doing so. "Do you see the benefits to you of something that has been a source of control over a particular person? "Do you think it will? "Lose the world would be a lot of success and a chance to prove this. "Like what you do is concerned, an aspect of your past is now. "Lose the way it is with that in mind, and this will be a time to re

Cancer

Today, you could be inclined to be clear about what you want to happen or control it. The sky is encouraging you to see the benefits of improving an old problem. "Do you see the benefits to you and you can be seen as a less than desirable result. "Deep it will be by its potential in the right way. "Do you feel about a particular situation? "Lose it will be fine. " " 'hole the chance to do so. "Delly water the whole thing the

Leo

Today, you can be certain that you are right to be carried and a need to prove yourself to be a bit more confident about what you want to achieve. "Do you want to resist it, you'll be reassured that you are right to be prepared to be surprised. "Do you see what you see in a particular area, then you will soon be grateful for what you need. "Do you instigate a much needed change to an area you want to be. "Like needs to be remo

Virgo

Today, you can be certain it is not as strong as you are. The sky insists you can be certain it will be the best possible result. "The sky is doing the same to you now. "You can only benefit from doing so. "Do you feel an opportunity now to do so now, it will be received soon. "Do you see what you see as a result of what you can do to influence an outcome? "he was a complex and sensitive side to your world, then you will soon

Libra

Today, if you want to be seen in a particular way, then you can be certain that you can bring a delightful result. 'The real meaning of something is to be forthcoming'. "Many storm in your sign is what you need to do now. "Lose what is yours is to be focused on what you need to do in a particular way. " " " 'get the boot' in an area you believe you don't want to be. "Delay it is the latter. "The little things happen overnight

Scorpio

Today, you can be certain the cosmos is trying to get you to do so. It will be the case. It is time to stand back and let the best way to see the reality of a situation you have been waiting for. "Deep it will be reached. "Do your heels is a brief restraint. "Do you see what you see as a better or impressive or irrelevant that you can accelerate a process that you can provide and the fact that you will soon feel more reassured

Sagittarius

Today, you can find yourself in the mood to retreat in a way that will be required to do so. "Deep it can be more appealing. "Do you a healthy sensitive side of yourself, the more you can achieve this to you. "Deep it can be for a while. 'can you see yours in the dark, then you can be a bit more flexible. "The cost of this week can be true to you.

Capricorn

Today, you can be concerned about what you want and need to be. The sky is determined to ensure you are right to be concerned about what you want and need. "Lose the world will be reciprocated. "Do you think it will be better to provide it? "he was the least above any longer, then that can be achieved and the sky insists that you are right to be proven to offer something to be reassured and accepting it. "Deeper and strengthen

Aquarius

Today, you can be certain that you are right to be prepared to do something that is necessary for you to do so. "Do you feel a need to prime yourself for a little while longer? "Delays of this is a time to start a great chance to prove to you. "Deep it can be a good time to rest. "Demanding the truth is the right and wrong. "Do you feel about something you want to see happen? "it is far from doing what you need to do to do. "D

Pisces

Conclusion

After experimenting with different models, Conditional RNN-Sequence Modeling had the most successful result. At temp 0.3, there aren't any spelling errors or excess amount of punctuations. Thus, for the final project, we would like to try using word-level language modeling, as character-level appears to produce more gibberish. We would also like to improve our model by making sure that sentences are grammatically complete sentences, not phrases. Additionally, it would be interesting to explore horoscopes in contexts other than as *daily fortune teller*. For example, love horoscopes that focus on compatibility, or horoscopes that are conditional on the date. As some sentences are nonsensical, we'd also like to improve the character-based sequence generation by incorporating post-processing methods into our final result.

Code: <https://github.com/seungye1/artxml3/>

Results: https://github.com/seungye1/artxml3/final_results.txt

Appendix

Playing with temp in generating a Pisces Horoscope:

Today, you can be certain that you can be certain it will be required to bring a real and potentially transformation. "Do you see the real you can be a bit more confident? "Deap you are. "Do you feel about something you want to see happen? "he was the line between the two of you. "'get it right now. "Do you think "it is to be to the point, the chance to do it! " " " " " " " " " " " " " " " " " coffee. You've every weary from doing! "

(0.1, 'Pisces')

Today, you can be the recipient of something you want to see happen. It might be time to adapt to a new level of comfort or reassurance that you can benefit from doing so. "Be willing to accept something you want to see happen and the cosmos is trying to encourage you to put it alone. "Do you allow the part of you that is likely to be reached and the sky insists you will soon be grateful for what you want to achieve. "Deep it

(0.3, 'Pisces')

Today, you have a choice about what you want to achieve. The sky implies that you are right to accept that you're being encouraged to assess what you want to see happen. "Trust you are to get a plan to a new level of success. "The truth is the right answer! "Do you can accept that a straightforward situation is a small and sensible result. "Self your belief in what you're conveying you are. "Do that fact that you don't want to

(0.5, 'Pisces')

Today, if you want people to one person recently, focus on the level of the well-meaning patterns now. "Do this fact. Try to be a bit too overly cautious. "To make your mind to the corner. "Deep will confirm you. 'Cross are in a way you are to listen. "Do you think of something that is to be. "Creating energy in some way can be waiting for funtains. "Reward will come in order to return to you. "Dearly won't come to light and t

(0.7, 'Pisces')

Today, if you can finally celebrate, you could find yourself enjoying a golden one group. 'Start" which is detrimenting and injustice. 'Win or hot water's link will get the future. "Dillbowellly like the glass relationship, you can be concerned. "concentrate, some of it most. 'calculations about it then, then you're less about to persuade you. "Getting it out to the past and vanish. "Will a spark that has serious, grey into th

(0.9, 'Pisces')

Today, I think right, but your battle goes. You're a February of an old job. "Criticized of styles is the past, try not to fall into course. 'End Gemini Prepare! Tyone very, once real outlook! 'List' or cherished your creation and retreated by smoothly. 'Like' and you won't take the form of tension and tension. 'give evils' and the delight that risks are likely to be going off with it. Let his up to do so. 'Steam a chance t

(1.1, 'Pisces')

Today, he tries to chal the companions! Kisfeac if they - deserve them to manine you as loving breath, love. 'Players, they know what to 'fhen, at this sent' they'd be! Hove look for whatever-it-is it. Faith is to be led by Venus or turn in past what puzzles, predeses you'll be heightened from. "That'll nothing presenting it is!" "new levels) wasn't nifferest! "Your sensitivity can take potential. 'Perhaps!' "Do that, if your a

(1.3, 'Pisces')

Today, its aidence nox's inconorousing solving bully into Saturn, accepting gossip, arrugmans the jourhear, nod. Helpful advice can and almost expect an omoth queecness where neither can be. "Pullie! 'Shake I' and you will. 'loosen luck' is to whom you overcame facts - too quickly. "Tenselophen world exists. ""To high like imilst.,' for them ahead you! "Do sopulnated Gemini supports or

(1.5, 'Pisces')

Seq-2-Seq and RNN Text generation:

Basic LSTM Text Generation:

n, we can discover than cinht be yoult an bone that mhathe be honithen in thath the hathent bithon an tore in you kon that an bere aly an a tigh the be bole or or manhe thet be honhing thet be hane be inting and ar on ar or any ou tor an antithing pamhing bathen. The het be binl nour on ing that bo han or monhe no hich you con tore bo hore to hon are to hin tor then in thithe you bore than you ing the he hething that be home an ou on an in the you be thent bo hon' t o han on then be bore to hon tor coule be athing athe the he in than bing ba hithe bomenling on you coul be thathe be coule ba in ance an or that be conhe domere an you coule be in thathe be then be bole than could that be homhon in to ming be be aning in af in you won sere and athe be soming bith be heme could bo houl of porhing thethe boule bo hor m oulin in that be aling that bo hon that you bonine thathe bethere bothens bouling ou an in that minh be balh bo hanh thathe bole bo houl of monhe bo hon thath bo hon bo hon af in

Sequence to Sequence - Learning Embeddings (100 data) :

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Sequence to Sequence - One Hot (100 data) :

['only have discover so ideas floating floating despite despite showing courtesy and and and enough enough enough enoug h to to to to to to to to to to we we is equally appealing action action action nothing nothing unsuitable a a t erritory territory a a a a a you you you you \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$', 'if there have been been some moments mome