
Stock Price Prediction

Create a model to predict the price of a stock based on previous trends

How will this App Work?

- Read data from a CSV
 - Scale the data to account for long term price changes
 - Train on a few years worth of data at a time
 - Predict the price based on current and previous trends
 - Makes use of Keras LSTM cells
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Topics

- Intro to Keras
 - Intro to LSTM cells
 - Fetching and transforming data
 - Creating training and testing datasets
 - Building the model
 - Training and testing the model
 - Interpreting results and using the model
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Prerequisites

- Some experience with Python
 - A platform to build and run Python apps
 - Some experience with Numpy, Pandas, and Pyplot
 - Some experience with Tensorflow
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Disclaimer

This is not a get rich quick scheme! The stock market is volatile and impossible to accurately predict 100% of the time. Sometimes the model will show very promising results; other times it won't. Either way, I cannot guarantee that this model will make you money. I would advise you not to gamble any money on the results of this app

Intro to Keras

Explore the Keras library

What is Keras?

- A library used to build neural networks for machine learning models
 - Specialized towards deep neural networks
 - Contains more abstract classes used to build models more easily than with Tensorflow
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How do we use Keras?

- Keras needs a backend framework for the machine learning computation; we will use Tensorflow
 - Add layers to a model one at a time using layer objects
 - Sequential models connect a layer to the next based on the order in which we added them
 - Functional models are more flexible and allow us more control over how to connect the layers
 - We will use a sequential model with Dense and LSTM layers
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Why use Keras?

- Model and layer objects make it much easier to build machine learning models
 - No longer have to build up our layers by creating and connecting variable and operation nodes
 - Specify loss and optimizer functions with the “compile” function
 - Use the “fit” function to train the model and the “predict” function to use the trained model
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Intro to LSTM

Explore how LSTM cells work

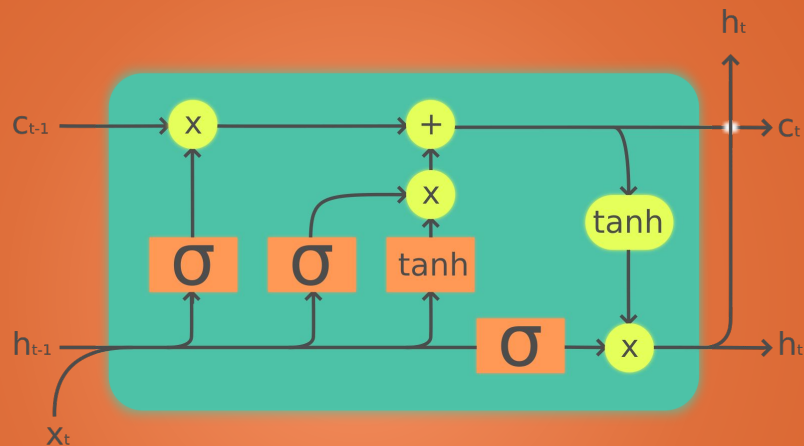
What is an LSTM Cell?

- Long short term memory cell
 - Used in RNNs (recurrent neural networks)
 - Great for series and sequences of data as they can “remember” previous values
 - Composed of input gate, output gate, forget gate
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What is an RNN?

- Recurrent neural network
 - Looped networks that allow information or state to persist between runs
 - Do not operate on a fixed number of layers but rather cycle the input through a single layer many times, combining current state with new input with each cycle
 - Often used in language and speech recognition, image captioning, text generation, etc.
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LSTM Cell Image



Legend:

Layer



Pointwise op



Copy



Why use LSTM Cells?

- Very good with sequence data such as time series
 - Fixes vanishing gradient problem in which extremely small values do not change and training ceases
 - Our stock prices will change over time and are considered time series so great for us to use
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Fetching and Transforming Data

Read data and scale it up

Tasks

- Get historical data from Yahoo finance
 - Read data into a dataframe
 - Scale data to account for growth over time
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Creating Datasets

Create training & testing datasets

Tasks

- Divide data into training and testing datasets
 - Convert and reshape data into a format that can be fed into our model
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Building the Model

Construct a price prediction model with Keras

Tasks

- Install Keras
 - Create a sequential model
 - Add Dense and LSTM layers
 - Add loss and optimizer functions
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Training and Testing the Model

Train and test the model we built on the datasets we created

Tasks

- Call model fit function
 - Evaluate accuracy
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Understanding Model Output

Convert the data into a readable format

Tasks

- Convert our results into scaled and readable data
 - Formulate some predictions
 - Graph model predictions
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Summary

Summarize our project

Topics

- Intro to Keras
 - Intro to LSTM cells
 - Fetching and transforming data
 - Creating training and testing datasets
 - Building the model
 - Training and testing the model
 - Interpreting results and using the model
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Where to go from Here

- Improve the model
 - Take other factors such as global news or sentiment into account
 - Explore different ways of building this model
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