# ML Nanodegree Capstone Project
# Investment and Trading application

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# Part I
# Definition

## Project Overview

Knowing the future of a market stock price is a very valuable information about risk of investment and is commonly pursued because of potentially infinite profits.

Currency ratio and stock markets forecasting based on technical analysis can be easily implemented in a script thanks to timeseries prediction nature of the problem. Price and volume are publicly accessible and can be used to train a model aiming to output the most likely future price.

In this project I have explored different Machine Learning techniques to find the best predictor of stock market values.

Project was inspired by personal experience in development of trading algorithms.

## Problem Statement

We want to predict the price of EURUSD ratio and NASDAQ stock. It is a timeseries forecasting problem. The goal is to create a script that will forecast future values basing on input provided as a starting point. Then a web application will serve forecasts live by downloading information from third party services.

## Evaluation Metrics

Because we are developing regression model a norm metric is required. For our purposes we will use Mean Squared Error (MSE) between predicted $y$ and actual values $\hat{y}$ (1). Model loss will be calculated from validation set that will be less or equal 20% of the actual values that a model tried to predict from a starting point. This means that up to 40% tail of the dataset is reserved only for evaluation during training and will not be fed as input.

For final model testing the actual values from validation set will be included as input to predict test actual values.

$$MSE = \frac{1}{2}(y - \hat{y})^2 \tag{1}$$

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Analysis
1 Data Exploration
2 Visualization
3 Algorithms & Techniques
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4 Benchmark Model
Part III
Methodology
5 Data Preprocessing
6 Implementation
7 Refinement
Part IV
Results
8 Model Evaluation and Validation
9 Justification
Part V
Conclusion
10 Reflection
11 Further Improvements

# References


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