DRONACHARYA
College of Engineering

Project Evaluation-1

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Project Title

“ Bitcoin price prediction model”

Objective of the Project

-To analyse the past price action of bitcoin and implement a machine learning algorithms to predict its future prices

Introduction

A cryptocurrency is a tradable digital asset or digital form of money, built on blockchain technology that only exists online. Cryptocurrencies use encryption to authenticate and protect transactions, hence their name. There are currently over a thousand different cryptocurrencies in the world, and many see them as the key to a fairer future economy

Cryptocurrency does not exist in physical form (like paper money) and is typically not issued by a central authority. Cryptocurrencies typically use decentralized control as opposed to a central bank digital currency (CBDC). When a cryptocurrency is minted or created prior to issuance or issued by a single issuer, it is generally considered centralized. When implemented with decentralized control, each cryptocurrency works through distributed ledger technology, typically a blockchain, that serves as a public financial transaction database.

Bitcoin, first released as open-source software in 2009, is the first decentralized cryptocurrency. Since the release of bitcoin, many other cryptocurrencies have been created.

Blockchain

The validity of each cryptocurrency's coins is provided by a blockchain. A blockchain is a continuously growing list of records, called *blocks*, which are linked and secured using cryptography. Each block typically contains a hash pointer as a link to a previous block, a timestamp and transaction data. By design, blockchains are inherently resistant to modification of the data. It is "an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way".For use as a distributed ledger, a blockchain is typically managed by a peer-to-peer network collectively adhering to a protocol for validating new blocks. Once recorded, the data in any given block cannot be altered

retroactively without the alteration of all subsequent blocks, which requires collusion of the network majority.

Blockchains are secure by design and are an example of a distributed computing system with high Byzantine fault tolerance. Decentralized consensus has therefore been achieved with a blockchain.

Anonymity

Bitcoin is pseudonymous rather than anonymous in that the cryptocurrency within a wallet is not tied to people, but rather to one or more specific keys (or "addresses"). Thereby, bitcoin owners are not identifiable, but all transactions are publicly available in the blockchain. Still, cryptocurrency exchanges are often required by law to collect the personal information of their users.

Important Timelines

In **2009**, the first decentralized cryptocurrency, bitcoin, was created by presumably pseudonymous developer Satoshi Nakamoto. It used SHA-256, a cryptographic hash function, in its proof-of-work scheme.

In ***April 2011***, Namecoin was created as an attempt at forming a decentralized DNS, which would make internet censorship very difficult.

Soon after, in **October 2011**, Litecoin was released. It used scrypt as its hash function instead of SHA-256. Another notable cryptocurrency, Peercoin, used a proof-of-work/proof-of-stake hybrid.

On **6 August 2014**, the UK announced its Treasury had commissioned a study of cryptocurrencies, and what role, if any, they could play in the UK economy. The study was also to report on whether regulation should be considered. Its final report was published in 2018, and it issued a consultation on cryptoassets and stablecoins in January 2021.

In **June 2021**, El Salvador became the first country to accept Bitcoin as legal tender, after the Legislative Assembly had voted 62–22 to pass a bill submitted by President Nayib Bukele classifying the cryptocurrency as such.

In **August 2021**, Cuba followed with Resolution 215 to accept Bitcoin as legal tender, which will circumvent U.S. sanctions.

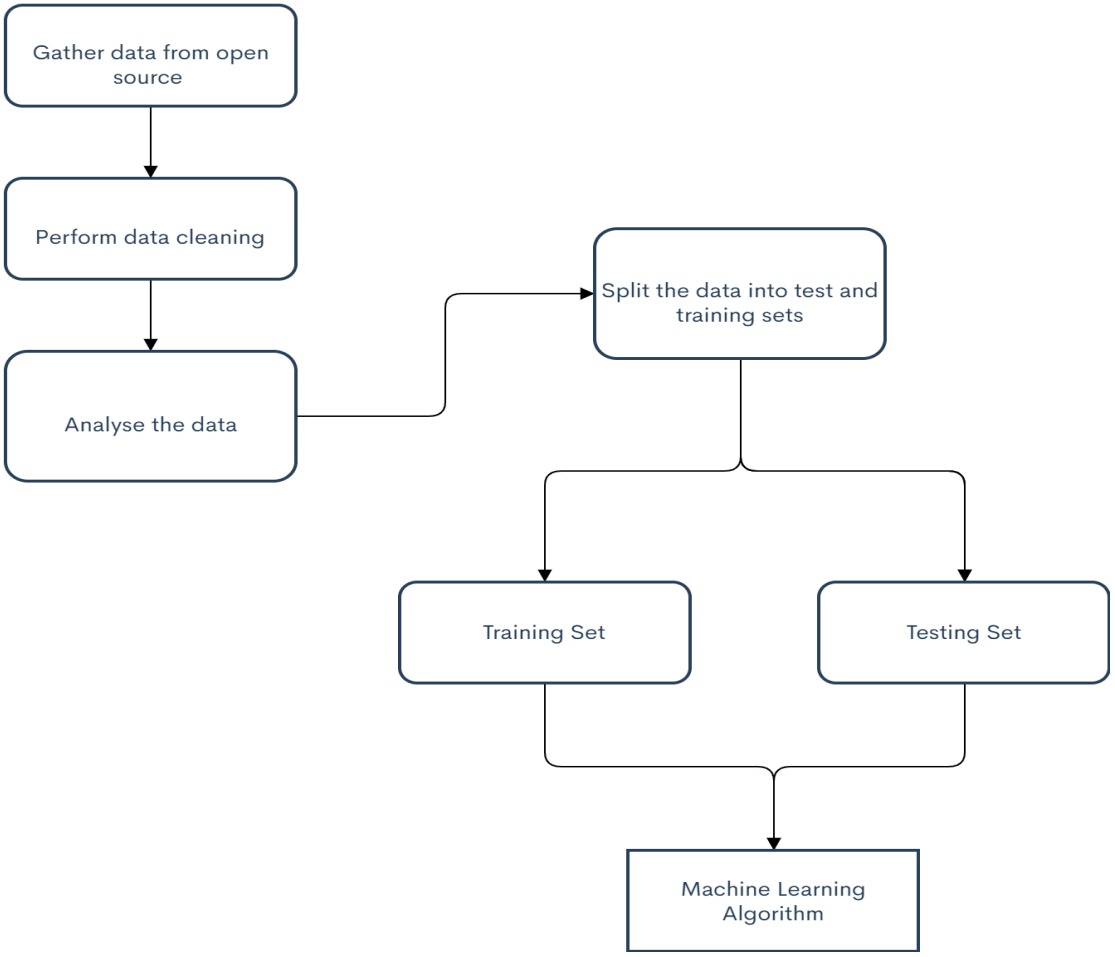
In **September 2021**, the government of China, the single largest market for cryptocurrency, declared all cryptocurrency transactions illegal, completing a crackdown on cryptocurrency that had previously banned the operation of intermediaries and miners within China.

Cryptocurrency Price Prediction Model

Since the price action of Bitcoin or any other cryptocurrencies is very volatile, prediction of price by technical analysis can be a little challenging as well as sometimes wrong too.

This arises the need to predict the future price by studying the past price action and the past price of Bitcoin.

This can be done by using Machine learning Algorithms



Today, data scientists can build data-crunching machines with complex algorithms for a few dollars per hour.

Broadly, there are 3 types of Machine Learning Algorithms

1. Supervised Learning

How it works: This algorithm consist of a target / outcome variable (or dependent variable) which is to be predicted from a given set of predictors (independent variables). Using these set of variables, we generate a function that map inputs to desired outputs. The training process continues until the model achieves a desired level of accuracy on

the training data. Examples of Supervised Learning: Regression, Decision Tree, Random Forest, KNN, Logistic Regression etc.

2. ***Unsupervised Learning***

How it works: In this algorithm, we do not have any target or outcome variable to predict / estimate. It is used for clustering population in different groups, which is widely used for segmenting customers in different groups for specific intervention. Examples of Unsupervised Learning: Apriori algorithm, K-means.

2. Reinforcement Learning:

How it works: Using this algorithm, the machine is trained to make specific decisions. It works this way: the machine is exposed to an environment where it trains itself continually using trial and error. This machine learns from past experience and tries to capture the best possible knowledge to make accurate business decisions.

We used Linear Regression Machine learning algorithm for our project.

Linear Regression

It is used to estimate real values (cost of houses, number of calls, total sales etc.) based on continuous variable(s). Here, we establish relationship between independent and dependent variables by fitting a best line. This best fit line is known as regression line and represented by a linear equation Y= a *X + b.

The best way to understand linear regression is to relive this experience of childhood. Let us say, you ask a child in fifth grade to arrange people in his class by increasing order of weight, without asking them their weights! What do you think the child will do? He / she would likely look (visually analyze) at the height and build of people and arrange them using a combination of these visible parameters. This is linear regression in real life! The child has actually figured out that height and build would

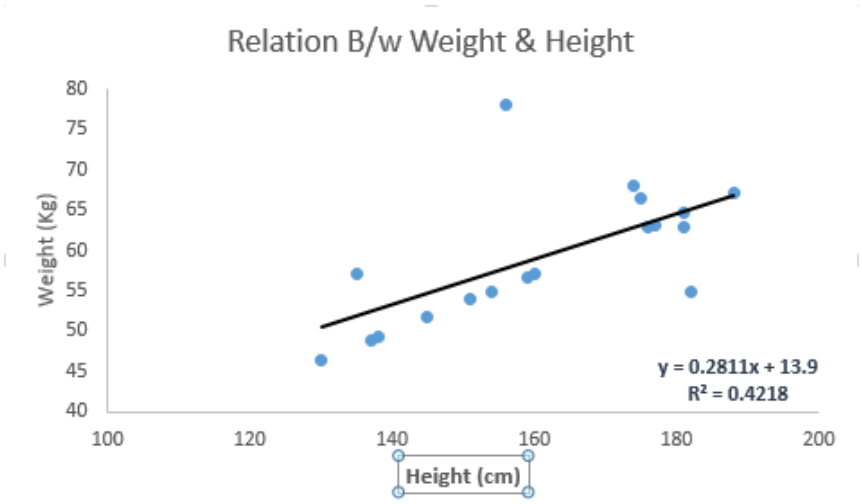
be correlated to the weight by a relationship, which looks like the equation above.

In this equation:

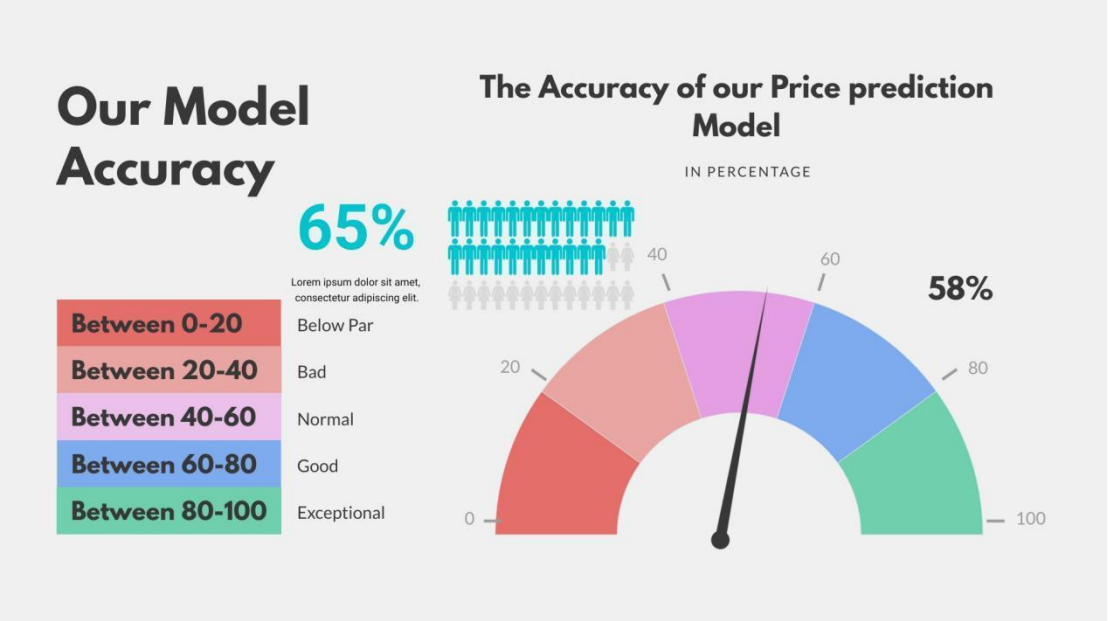
- Y – Dependent Variable
- a – Slope
- X – Independent variable
- b – Intercept

These coefficients a and b are derived based on minimizing the sum of squared difference of distance between data points and regression line.

Look at the below example. Here we have identified the best fit line having linear equation **y=0.2811x+13.9**. Now using this equation, we can find the weight, knowing the height of a person.



Linear Regression is mainly of two types: Simple Linear Regression and Multiple Linear Regression. Simple Linear Regression is characterized by one independent variable. And, Multiple Linear Regression(as the name suggests) is characterized by multiple (more than 1) independent variables. While finding the best fit line, you can fit a polynomial or curvilinear regression. And these are known as polynomial or curvilinear regression.



Technologies Used in the Cryptocurrency price prediction model

1. Python
2. Numpy Library
3. Pandas Module for Python
4. Matplotlib
5. Seaborn
6. Linear Regression ML Algorithm