

NFTs - Cryptocurrency Energy Consumption, Environmental Concerns and Price Volatility Research



Bitcoin



Ethereum



Dogecoin



Non-fungible token



Cardano



Litecoin

Data Analytics Tools

- Presentation - Google slides, Tableau, Github- Readme.md
- Github - Code and images
- Machine Learning Model - Energy consumption using LSTM
- Database - Postgresql
- Dashboard - Google Slides, interactive tool using flask
- <https://github.com/jcsargis00/NFT-Research>

Presentation

Purpose - to research if there are real environmental and financial concerns using cryptocurrency to mint and sell NFTs.

Background - NFTs have been linked to cryptocurrency blockchains. It is not a technical requirement to use cryptocurrency to mint and sell NFTs. This project researches environmental and volatility concerns with cryptocurrency and presents an alternative solution

Glossary - terminology for NFTs, cryptocurrency, websites tracking currency, NFT examples

References - Why do cryptocurrencies use so much energy? Charts with data

How does cryptocurrency work? - illustration

How much energy do Ethereum and Bitcoin use globally? Charts from projects

Github

Storage of code, data, images for analysis and machine learning model

Examples included:

- database files, csv files for tracking 8 types of cryptocurrency
- Interactive model to look at 4 different cryptocurrencies using Flask
- Model to scrape prices of 4 different cryptocurrencies for 99 days using BeautifulSoup
- Reference articles from Nature and the ACM
- Machine Learning model connected to a database or using CSV files to predict energy consumption

Machine Learning Model

Dataset - <http://archive.ics.uci.edu/ml/datasets/Individual+household+electric+power+consumption>

The measurements are of electric power consumption in one household with a one-minute sampling rate over almost 4 years. The data was collected between 12/2006 and 11/2010 every minute.

Data schema:

Date - note that date was in European format and was transformed from dd/mm/yyyy to mm/dd/yyyy for database connection.

Time - no time zone, am/pm

global_active_power, global_reactive_power, voltage, global_intensity, sub_metering_1, sub_metering_2, sub_metering_3

LSTM model was built to predict household electric power consumption.

- The first year of data (resampled over an hour) was used to train the model and the rest of the data to test the model to reduce the computation time and get some results quickly.

Database

Financial data from Coin Gecko, Coin Market Cap, Yahoo Finance

Schema for crypto pricing tables and interactive charts

- Symbol - symbol for which the time series data refers
- Open - the opening price of the time period
- High - the highest price of the time period
- Low - the lowest price of the time period
- Close - This is the closing price of the time period
- Volume (Crypto) - the volume in the transacted Ccy. Ie. For BTC/USD, this is in BTC amount
- Volume Base Ccy - the volume in the base/converted ccy. Ie. For BTC/USD, this is in USD amount

Environmental data from kaggle:

<https://www.kaggle.com/datasets/uciml/electric-power-consumption-data-set?resource=download>

Dashboard

Datasets:

<https://github.com/jcsargis00/NFT-Research/tree/main/Resources/data>

ERD Diagram:

<https://github.com/jcsargis00/NFT-Research/blob/main/images/erd.PNG>

Interactive Elements:

- Flask to display 4 different cryptocurrencies
- Beautiful Soup application to scrape Coin Market Cap website data for 99 days