**Bitcoin Price Prediction Using Informer (PyTorch)**

This project implements a simplified Informer model in PyTorch to predict Bitcoin (BTC-USD) prices using historical daily price data from Yahoo Finance.

**Features**

* Downloads historical Bitcoin price data via yfinance.
* Preprocesses data into sequences for time-series prediction.
* Implements an Informer-style model using self-attention.
* Trains and evaluates the model.
* Visualizes predicted vs actual prices.

**Model: Informer (Simplified)**

The model includes:

* Linear embedding of input features
* Multi-head self-attention
* Position-wise feedforward network
* Prediction decoder for forecasting.

**Project structure**

* Informer.py #Main code
* Readme.md #documentation

**Dependencies**

Make sure you have the following packages installed:

pip install torch pandas yfinance scikit-learn matplotlib

**How to Run**

1. Clone this repository or copy the script.
2. Run the script:

bash

python bitcoin\_informer.py

The script will:

* Fetch BTC-USD data from 2014 to March 2025.
* Train an Informer model on the closing price.
* Display a plot comparing predicted and actual prices.

**Model Parameters**

* **Input Sequence Length:** 30 days
* **Prediction Horizon:** 1 day ahead
* **d\_model:** 64
* **n\_heads:** 4
* **Epochs:** 50
* **Batch Size:** 32

**Output**

* Console printout of loss per epoch
* Sample predicted vs actual values
* Matplotlib graph showing prediction results

