Prediction Model

Machine Learning

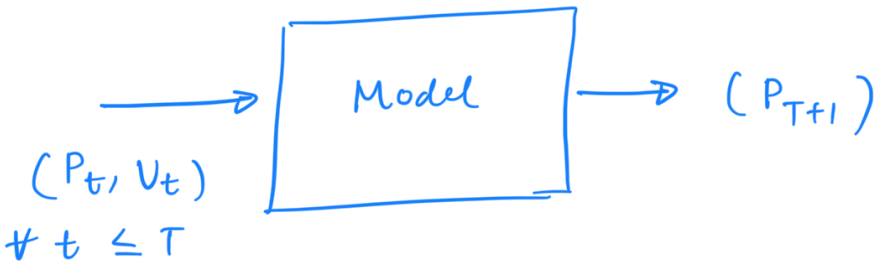
Overview :-

We consider the cryptocurrencies :-

Ethereum, Bitcoin, Cardano, XRP, Solana, Binance coin, Dogecoin, USDC, Tron, Avalanche, Litecoin.

We will build a model which will forecast the prices of these coins, one month from now. For this purpose, we only take the monthly data, since daily data contributes a lot of noise

We only take the closing price and the volume traded. So initially we have a Bivariate time series (P_t, V_t).



Data :-

Let's Analyse the data of one of the coins and see what we can infer.

This is the price chart of Ethereum coin. This is a time series data.

We see that the process looks like a Brownian Motion but we don't know yet the parameters. To get the initial estimates of where the price c move in future, we consider the returns calculate as :-

$$r_i = \frac{P_i - P_{i-1}}{P_{i-1}}$$

We consider the model :-

① – $\boxed{dr(t) = K(\theta - r(t))\,dt + \sigma\,dW(t)}$ with initial condition $r(0) = r_0$ and $W(t)$ being the standard Brownian motion.

To solve ①, we try $f(r(t), t) = r(t)\,e^{Kt}$

Using Ito lemma,

$$df(r(t), t) = K r(t) e^{Kt}\,dt + e^{Kt}\,dr(t)$$

$$= K r(t) e^{Kt}\,dt + e^{Kt}\left[K(\theta - r(t)) + \sigma\,dW(t)\right.$$