

Advanced Computational Physics

Problem Set 7

(Due Date : 1404/09/30)

Problems

1. Fractal dimension

- Read the dataset `XAUUSD2.csv` and extract the `Timestamp` and `Volume` columns.
- Normalize the volume data to the interval $[0, 1]$ using

$$V_{\text{norm}} = \frac{V - \min(V)}{\max(V) - \min(V)}. \quad (1)$$

- Estimate the fractal dimension using the box-counting method, defined by the scaling relation

$$N(\epsilon) \propto \epsilon^{-D}. \quad (2)$$