

## Advanced Computational Physics

### Problem Set 7

*(Due Date : 1404/09/2)*

#### Problems

##### 1. Fractal dimension

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

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

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

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