

## Example Assignment – Super Simple Stock Market

### Requirements

1. Provide working source code that will :-
  - a. For a given stock,
    - i. Given any price as input, calculate the dividend yield
    - ii. Given any price as input, calculate the P/E Ratio
    - iii. Record a trade, with timestamp, quantity of shares, buy or sell indicator and traded price
    - iv. Calculate Volume Weighted Stock Price based on trades in past 15 minutes
  - b. Calculate the GBCE All Share Index using the geometric mean of prices for all stocks

### Constraints & Notes

1. Written in one of these languages:
  - Java, C#, C++, Python
2. No database or GUI is required, all data need only be held in memory
3. No prior knowledge of stock markets or trading is required – all formulas are provided below.

**Table1. Sample data from the Global Beverage Corporation Exchange**

| Stock Symbol | Type      | Last Dividend | Fixed Dividend | Par Value |
|--------------|-----------|---------------|----------------|-----------|
| TEA          | Common    | 0             |                | 100       |
| POP          | Common    | 8             |                | 100       |
| ALE          | Common    | 23            |                | 60        |
| GIN          | Preferred | 8             | 2%             | 100       |
| JOE          | Common    | 13            |                | 250       |

*All number values in pennies*

**Table 2. Formula**

|                             | Common   | Preferred   |
|-----------------------------|--|---|
| Dividend Yield              | $\frac{\text{Last Dividend}}{\text{Price}}$  | $\frac{\text{Fixed Dividend} \cdot \text{Par Value}}{\text{Price}}$ |
| P/E Ratio                   |  | $\frac{\text{Price}}{\text{Dividend}}$                              |
| Geometric Mean              |  | $\sqrt[n]{p_1 p_2 p_3 \dots p_n}$                                   |
| Volume Weighted Stock Price | $\frac{\sum_i \text{Traded Price}_i \times \text{Quantity}_i}{\sum_i \text{Quantity}_i}$ |   |