

**ABI E-Retail Technical Test**  
**21<sup>st</sup> March 2023**

**1. Mixed Effects Model:**

Question: Analyze the impact of various socio-economic and health-related factors on life expectancy across different countries and years using a mixed effects model, while accounting for the variability within and between countries and years.

Packages that can be used: pymr4, statsmodels

Expectation: You are expected to demonstrate some degree of understanding of the theory behind mixed effects model, difference in usage of fixed vs random effects. Feel free to restrict yourself to fewer variables if needed. The final output should explain the contribution of each selected variable towards the target signal.

Data Link : <https://www.kaggle.com/datasets/kumarajarshi/life-expectancy-who/code>

**2. Multi-Processing:**

Question: Write a Python program that to process this data and extract the following insights.

- i. The total revenue generated by the store.
- ii. The top 10 customers who have spent the most money at the store.
- iii. The top 10 items that have been sold the most in terms of quantity.
- iv. The total number of transactions that have taken place.

Expectation: You are expected to demonstrate the use of multi-processing libraries to achieve the above task.

Data Link : <https://www.kaggle.com/datasets/marian447/retail-store-sales-transactions>