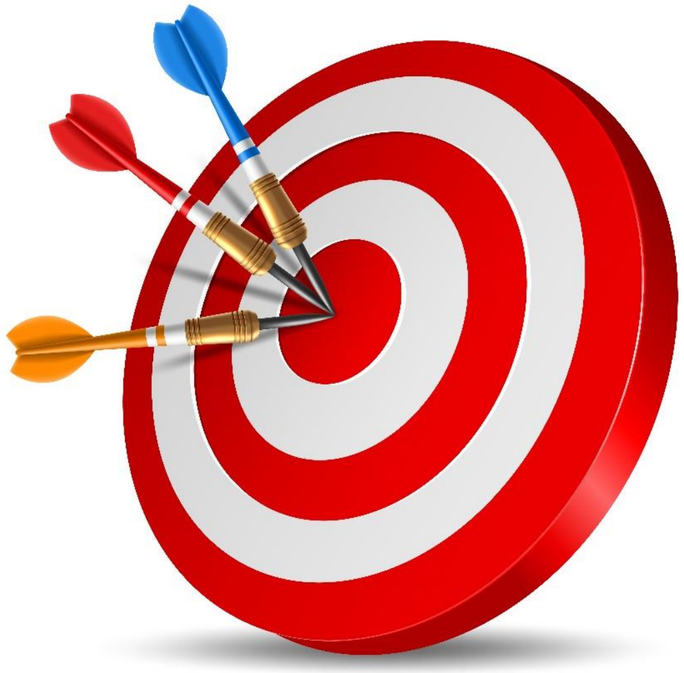
After Module 4

Assignment:
Build a Comprehensive Financial Model for a 3-Year Budget Plan for an E-Commerce Company

Objective:

To create a detailed financial model that forecasts revenue, expenses, and profits for the next three years of an e-commerce business. Students will apply predictive modeling, optimization techniques, and scenario analysis to build and present the budget.



Expected Learning Outcomes

Learners will be able to:

- Forecast revenue and expenses using advanced AI models.
- Optimize budgets within constraints.
- Present insights effectively to support strategic decision-making.

Instructions

Step 1: Define the Scope

Business Context: Assume you are building a 3-year budget for an e-commerce business selling consumer electronics.

Key Objectives:

- Forecast annual revenue and expenses.
- Optimize advertising and inventory budgets.
- Include a risk-adjusted profit projection.

Step 2: Data Collection

Use publicly available datasets:

- **Sales Data:** Download historical sales data from Kaggle (e.g., "E-commerce Data").
- **Macroeconomic Indicators:** Use FRED Economic Data for inflation and consumer spending trends.
- **Advertising Data:** Access online campaign performance datasets, like those on Google Dataset Search.

Step 3: Revenue Forecasting

1. **Historical Analysis:**
   - Analyze trends in monthly sales, seasonal patterns, and promotional impacts
2. **Predictive Modeling:**
   - Use machine learning models such as ARIMA or LSTM to forecast revenue for the next three years.
   - Incorporate external factors like inflation, consumer spending, and competition.

Step 4: Expense Projections

1. **Expense Categories:**
   - Variable costs: Advertising, shipping, payment processing fees.
   - Fixed costs: Salaries, technology infrastructure, warehouse costs.
2. **Expense Forecasting:**
   - Use historical data to project expenses.
   - Correlate variable costs with revenue growth.

Step 5: Budget Optimization

1. **Define Constraints:**
   - Set limits for maximum advertising spend, minimum inventory levels, and staffing growth.
2. **Optimization Techniques:**
   - Apply linear programming or genetic algorithms to allocate advertising and inventory budgets efficiently.
   - Use Python libraries like SciPy or PuLP.

Step 6: Scenario Analysis

Create at least three scenarios:

1. **Best-Case Scenario:** Optimistic revenue growth with controlled expenses.

2. **Base Case:** Steady revenue growth with moderate expense increases.

3. **Worst-Case Scenario:** Lower revenue growth due to economic downturns.

Step 7: Final Report and Presentation

- Deliverables:
  - A detailed Excel/Python-based financial model.
  - A dashboard or visual summary (using tools like Tableau, Excel, or Power BI).
  - A 2-3 page summary explaining:
    - Key findings and assumptions.
    - Revenue, expense, and profit projections.
    - Recommendations based on scenario analysis.