Car Ownership Analysis Writing Task

Purchasing and owning a car represents one of the most significant financial decisions many people make. Understanding the full costs of car ownership and comparing different acquisition options requires careful mathematical analysis. This assignment will help you apply key concepts from this module to real-world vehicle purchasing and ownership decisions.

The Assignment

Part 1: Comparing Purchase Options

1. Select three different car acquisition scenarios to analyze:
    - **Scenario A:** Buying a new car with a loan
    - **Scenario B:** Buying a used car with a loan
    - **Scenario C:** Leasing a new car
2. For each scenario, research and document:
    - Vehicle specifications (make, model, year, features)
    - Purchase/lease price and terms
    - Interest rates and loan duration (if applicable)
    - Down payment requirements
    - Monthly payment calculations
3. Calculate the total cost of ownership over a 5-year period for each scenario, including:
    - Monthly payments (loan or lease)
    - Estimated depreciation
    - Insurance costs
    - Fuel expenses (based on estimated mileage and fuel efficiency)
    - Maintenance and repair costs
    - Registration and taxes

Part 2: Financial Analysis

4. For the loan options (Scenarios A and B), create an amortization table showing:
    - Monthly payment breakdown between principal and interest
    - Remaining balance after each payment
    - Cumulative interest paid over time
    - Visual representation (graph) of the principal-to-interest ratio changes over time
5. For the lease option (Scenario C), calculate:
    - Monthly depreciation
    - Money factor and equivalent APR

    - Residual value at the end of the lease
    - Total of all payments over the lease term
    - Cost comparison between leasing for two consecutive terms versus buying and keeping for 6 years
6. Analyze how different down payment amounts would affect:
    - Monthly payment amounts
    - Total interest paid over the life of the loan(s)
    - The break-even point for different scenarios

Part 3: Ownership Cost Projections

7. Create a spreadsheet showing the long-term costs of each scenario that includes:
    - Year-by-year expense breakdown
    - Cumulative costs over time
    - The "true cost of ownership" per mile driven
    - Impact of fuel price fluctuations (+/- 20%)
    - Vehicle value at different points in time
8. Develop a savings plan for maintenance and repairs:
    - Calculate the appropriate monthly savings amount based on the vehicle type and age
    - Create a projection of maintenance costs over time
    - Show how unexpected major repairs would impact your financial situation

Part 4: Decision Analysis and Reflection

9. Create a decision matrix that:
    - Identifies key decision factors (cost, reliability, lifestyle fit, etc.)
    - Assigns weights to each factor based on importance
    - Scores each vehicle acquisition option
    - Calculates a weighted score to determine the best option
10. Write a 1-page reflection addressing:
    - The mathematical insights gained from your analysis
    - How depreciation affects the total cost of ownership
    - The financial trade-offs between buying new, buying used, and leasing
    - How your analysis connects to broader financial planning concepts
    - The non-financial factors that might influence the decision

Your submission should include:

- Comprehensive cost analysis for all three scenarios
- Complete amortization tables for loan options
- Detailed lease calculations
- Spreadsheet with long-term cost projections
- Decision matrix with weighted scoring
- Visual representations of key data (graphs, charts)
- Thoughtful reflection on the mathematical and financial implications

This assignment is worth 20 points. Your work will be assessed on the accuracy of calculations, depth of analysis, quality of your long-term projections, and application of course concepts to real-world vehicle purchasing decisions.

Rubric:

Criteria	Proficient	Developing	Not Evident	Points
Purchase Option Comparison	Thoroughly analyzes all three scenarios with accurate research. Includes comprehensive cost components for each option. All specifications and terms are clearly documented and realistic. Calculations are accurate and well-explained.	Analyzes most aspects of the scenarios with minor gaps or inaccuracies. Some cost components may be missing or imprecise. Most calculations are correct with minor errors.	Significant gaps in scenario analysis. Major cost components missing. Unrealistic specifications or terms. Multiple calculation errors.	___/5
Financial Analysis	Creates accurate, complete amortization tables and lease calculations. Correctly analyzes payment structures and interest costs. Multiple down payment scenarios are thoroughly examined. Visual representations clearly illustrate financial concepts.	Most calculations are correct with minor errors or omissions. Basic analysis of payment structures and down payment scenarios. Visual representations present but may lack clarity or depth.	Significant errors in loan or lease calculations. Incomplete amortization tables. Limited or incorrect analysis of payment structures. Poor or missing visual representations.	___/6

Ownership Cost Projections	Develops comprehensive, realistic long-term cost projections. Thoroughly examines maintenance and repair considerations. Accurately calculates per-mile costs and vehicle depreciation. Effectively analyzes the impact of variable costs.	Basic long-term projections with some gaps or simplifications. Some maintenance considerations addressed. Basic per-mile cost analysis. Limited examination of variable costs.	Minimal or unrealistic long-term projections. Few maintenance considerations. Missing or incorrect per-mile calculations. Little to no analysis of variable costs.	___/5
Decision Analysis & Reflection	Creates thorough decision matrix with well-reasoned weightings. Reflection demonstrates excellent understanding of vehicle ownership economics. Clearly connects mathematical concepts to financial planning. Thoughtfully addresses trade-offs between options.	Basic decision matrix with reasonable weightings. Reflection shows general understanding of ownership costs. Some connections between mathematics and financial planning. Basic discussion of trade-offs.	Minimal or poorly constructed decision matrix. Reflection shows limited understanding of ownership economics. Few connections to financial planning concepts. Limited discussion of trade-offs.	___/4
Total				___/20