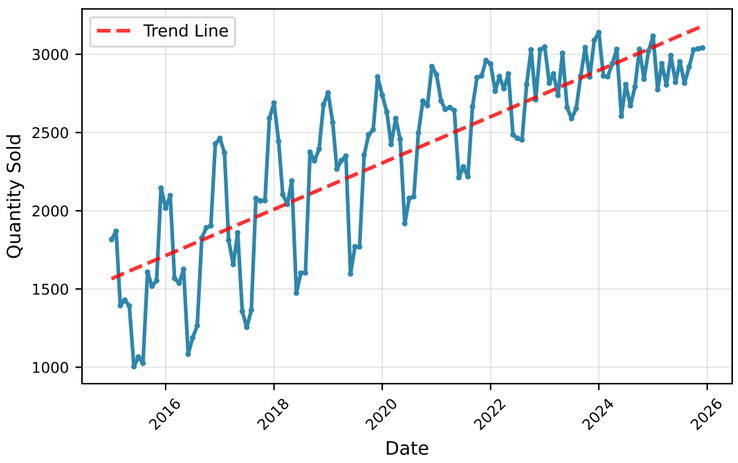
ARIMA DEMONSTRATION: STEP 1 & STEP 2 COMBINED ANALYSIS
Stationarity Testing + Seasonal Decomposition for Metformin 500mg

STEP 1.1: Original Time Series
Metformin 500mg Sales Data



STEP 1.2: Augmented Dickey-Fuller Test

ADF Statistic: -4.194667
p-value: 0.000673
Critical Values:
1%: -3.486535
5%: -2.886151
10%: -2.579896

Conclusion: STATIONARY
p-value ≤ 0.05

STEP 1.3: Data Statistics

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Mean: 2373.17
Std Dev: 568.44
Min: 1004.00
Max: 3139.00
Range: 2135.00
Skewness: -0.736
Kurtosis: -0.561
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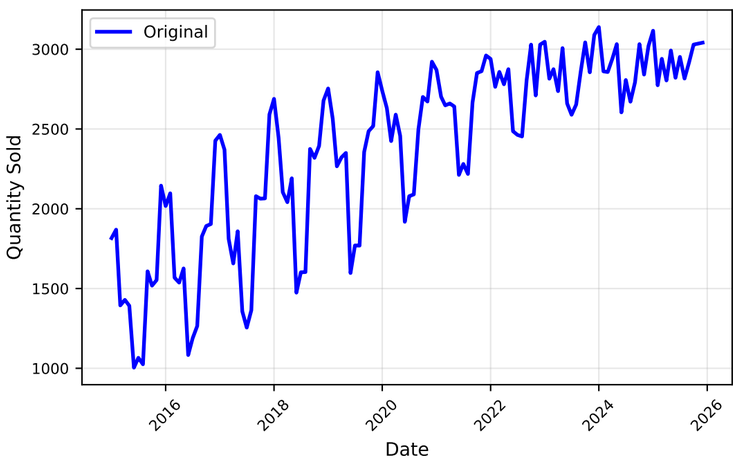
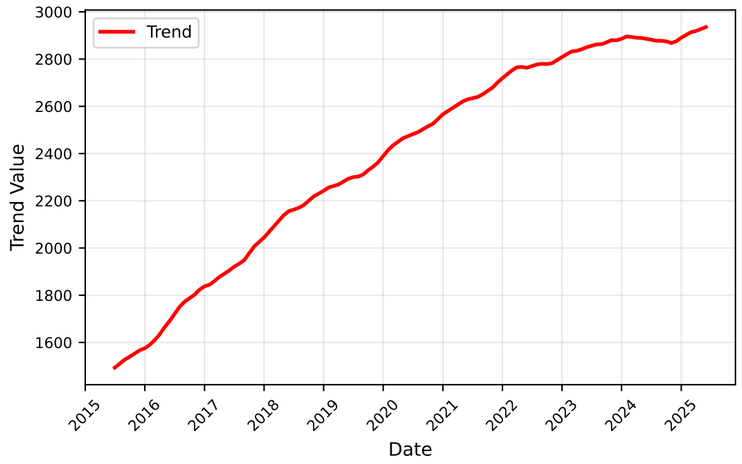
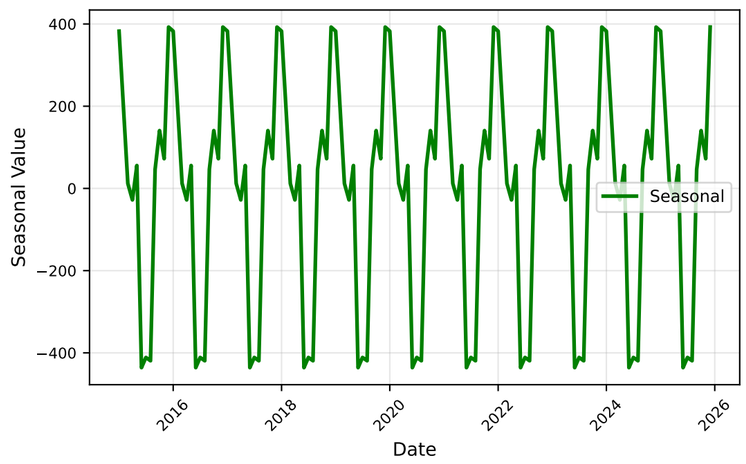
STEP 2.1: Original Data
(Reference for Decomposition)



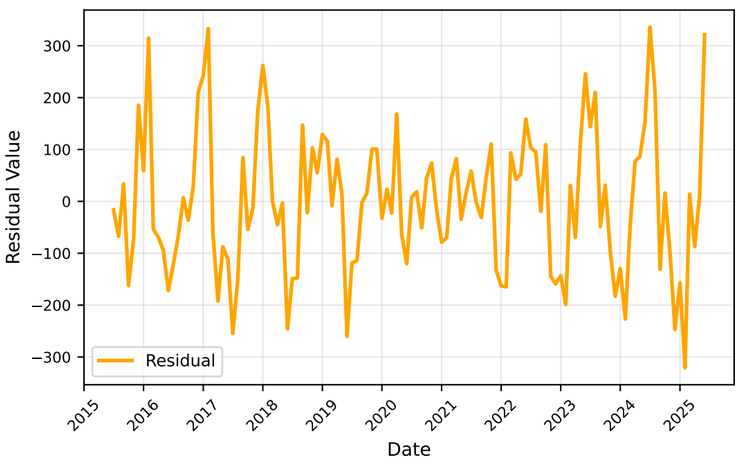
STEP 2.2: Trend Component
(Decomposed from Original)



STEP 2.3: Seasonal Component
(12-Month Pattern)



STEP 2.4: Residual Component
(Noise/Error)



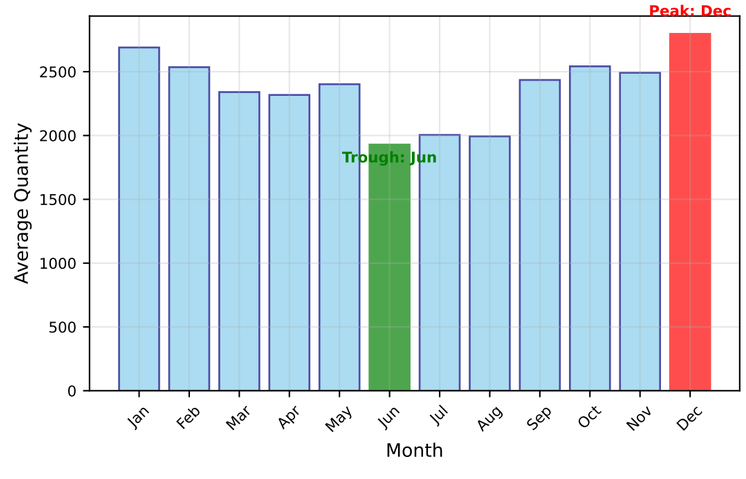
STEP 2.5: Seasonal Analysis

Components Present:
• Trend: Yes
• Seasonal: Yes
• Residual: Yes

Component Strengths:
• Seasonal: 0.2348
• Trend: 0.6078
• Residual: 0.0564

Seasonal Assessment:
STRONG Seasonal Pattern
Seasonal Strength: 23.5%

STEP 2.6: Monthly Pattern
(Average Sales by Month)

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COMBINED ANALYSIS SUMMARY - Metformin 500mg Sales Data
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STEP 1: STATIONARITY TESTING
• ADF Test Result: STATIONARY (p-value: 0.000673)
• Data Characteristics: Stationary data suitable for ARIMA modeling
• Statistical Properties: Mean=2373.2, Std=568.4, Range=2135.0

STEP 2: SEASONAL DECOMPOSITION
• Seasonal Pattern: STRONG (Strength: 23.5% if 'seasonal_strength' in locals() else 'N/A')
• Trend Component: Present
• Seasonal Component: Present
• Peak Month: Dec | Trough Month: Jun

CONCLUSION: The data exhibits both stationarity and strong seasonal patterns,
making it suitable for seasonal ARIMA (SARIMA) modeling.
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