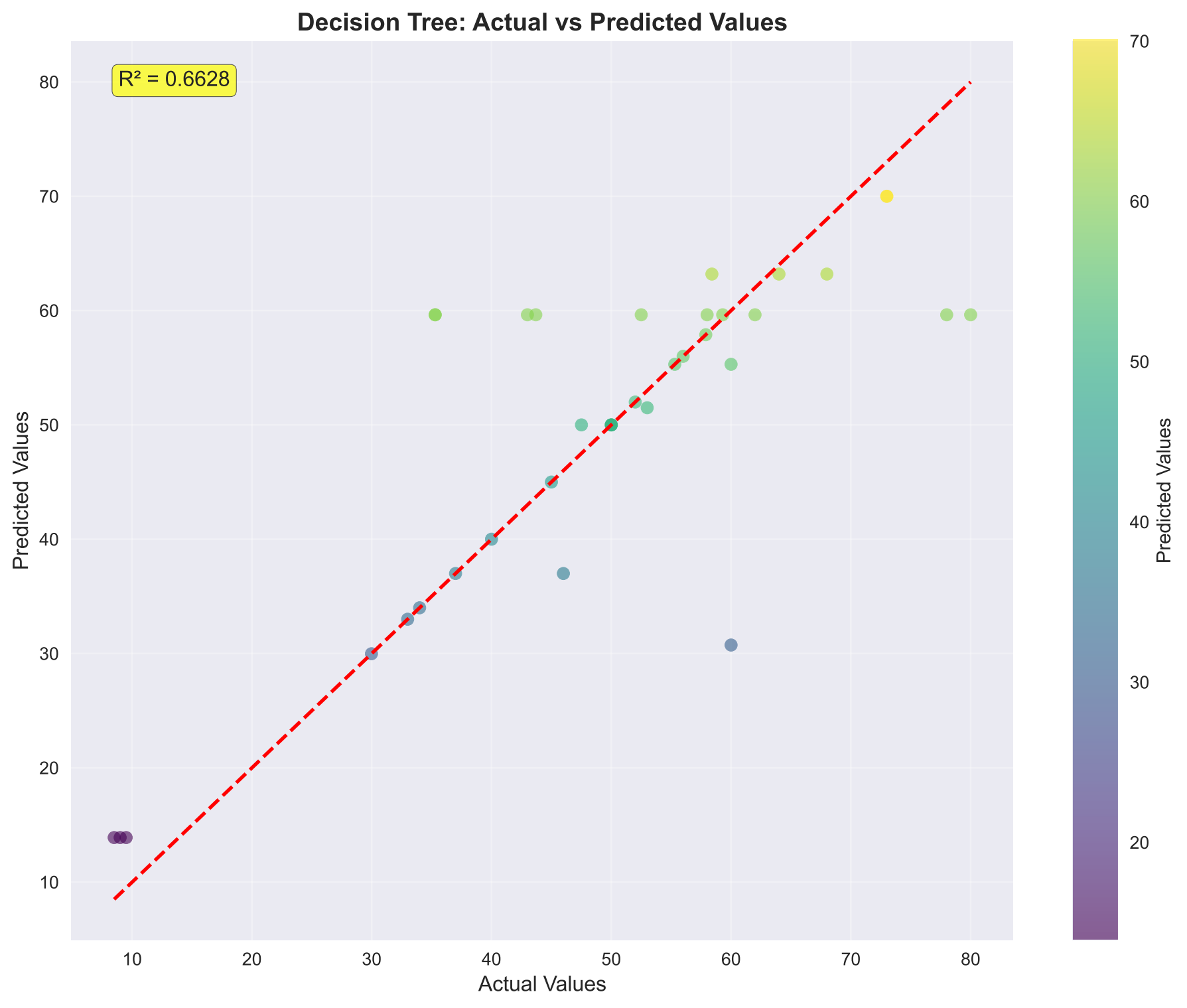
Model Performance Report: Decision Tree

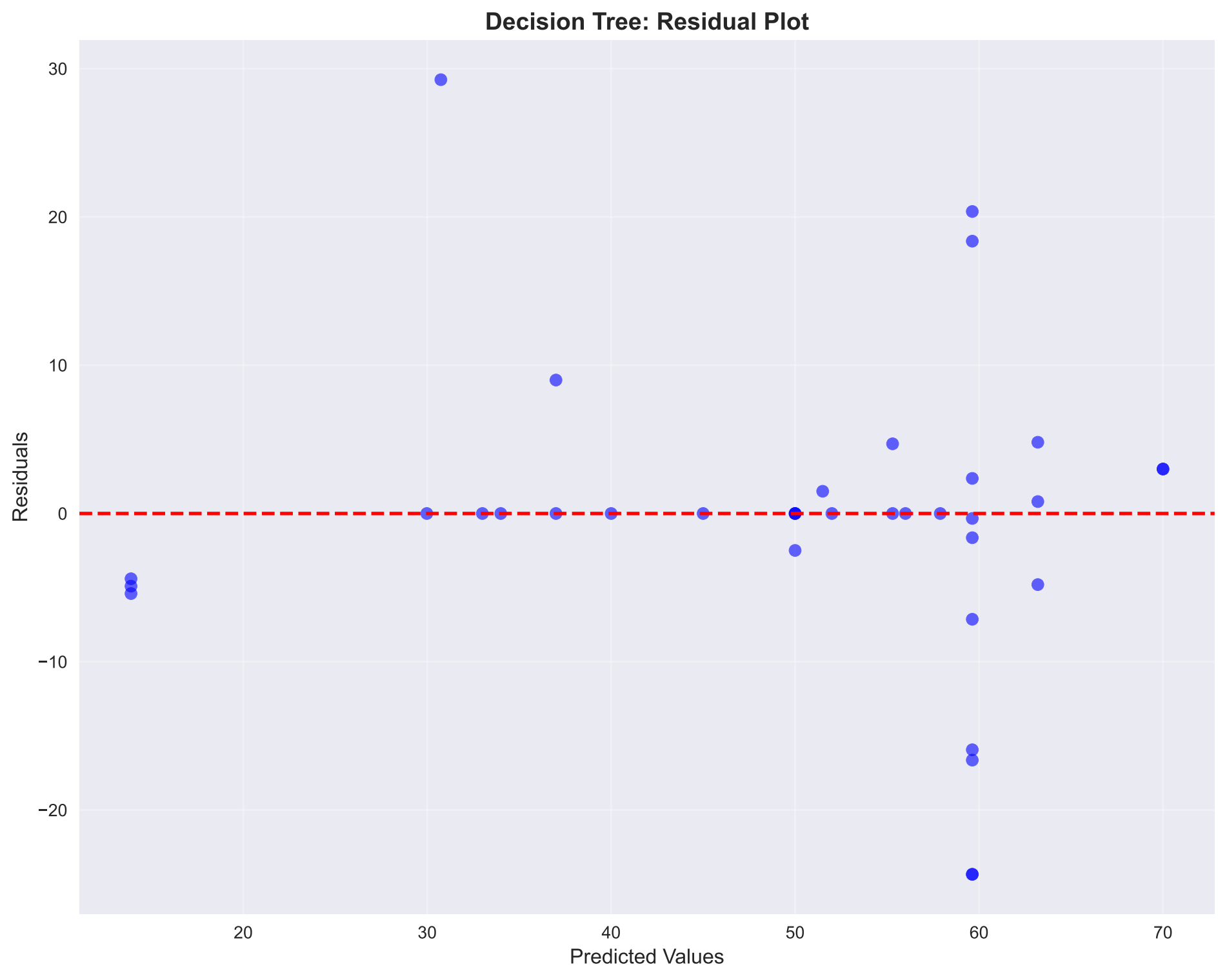
MODEL DETAILS:
• Algorithm: Decision Tree
• Training Samples: 141
• Test Samples: 36
• Features: 12

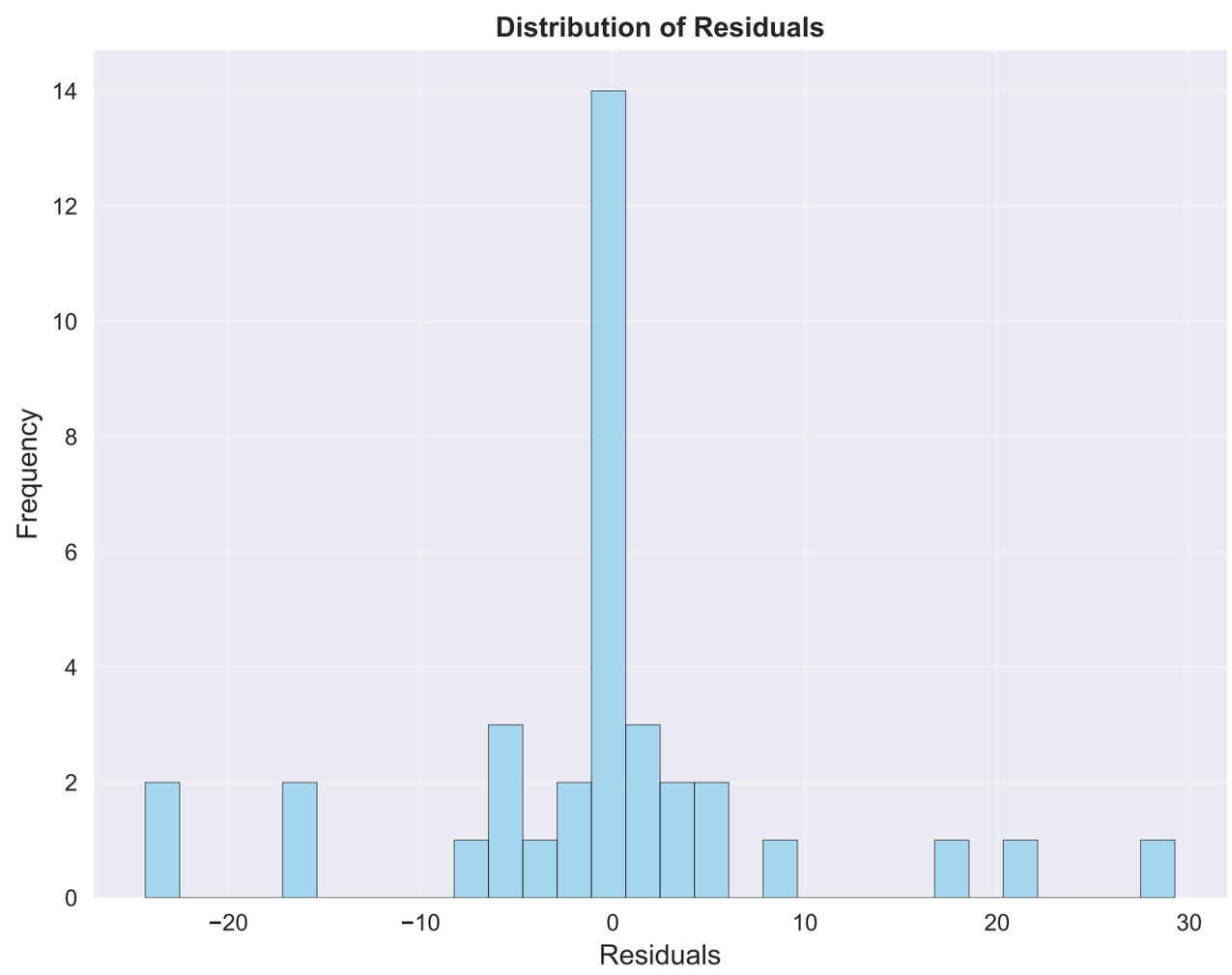
PERFORMANCE METRICS:
• Root Mean Square Error (RMSE): 10.0428
• R^2 Score: 0.6628
• Mean Absolute Error (MAE): 5.8190
• Mean Square Error (MSE): 100.8572

INTERPRETATION:
• R^2 Score of 0.6628 means the model explains 66.28% of the variance
• RMSE of 10.0428 indicates average prediction error
• Lower RMSE and MAE values indicate better model performance
• R^2 closer to 1.0 indicates better model fit

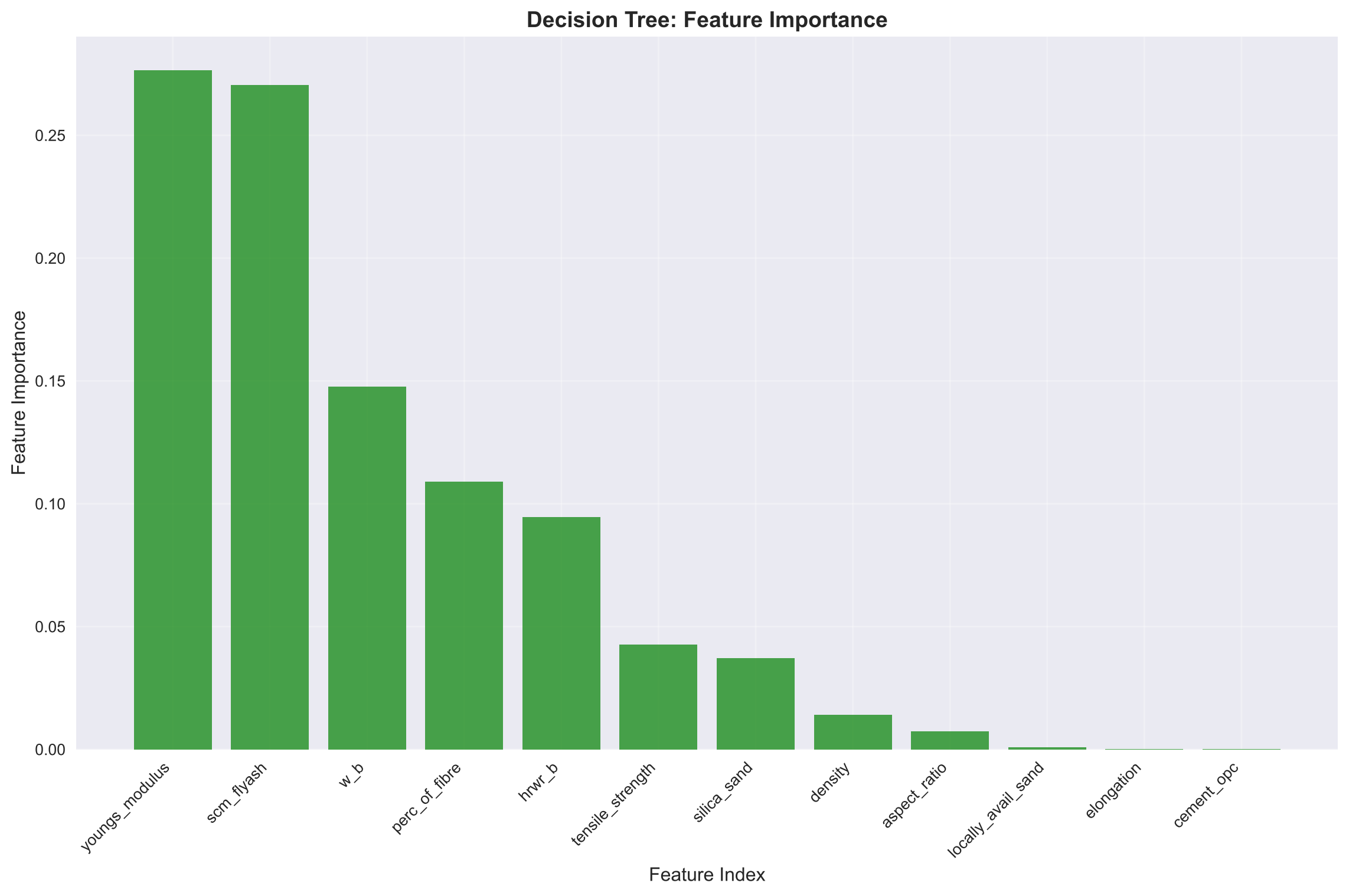
DATASET INFORMATION:
• Target Variable: Last Column
• Problem Type: Regression
• Cross-validation: 3-fold GridSearchCV used for hyperparameter tuning

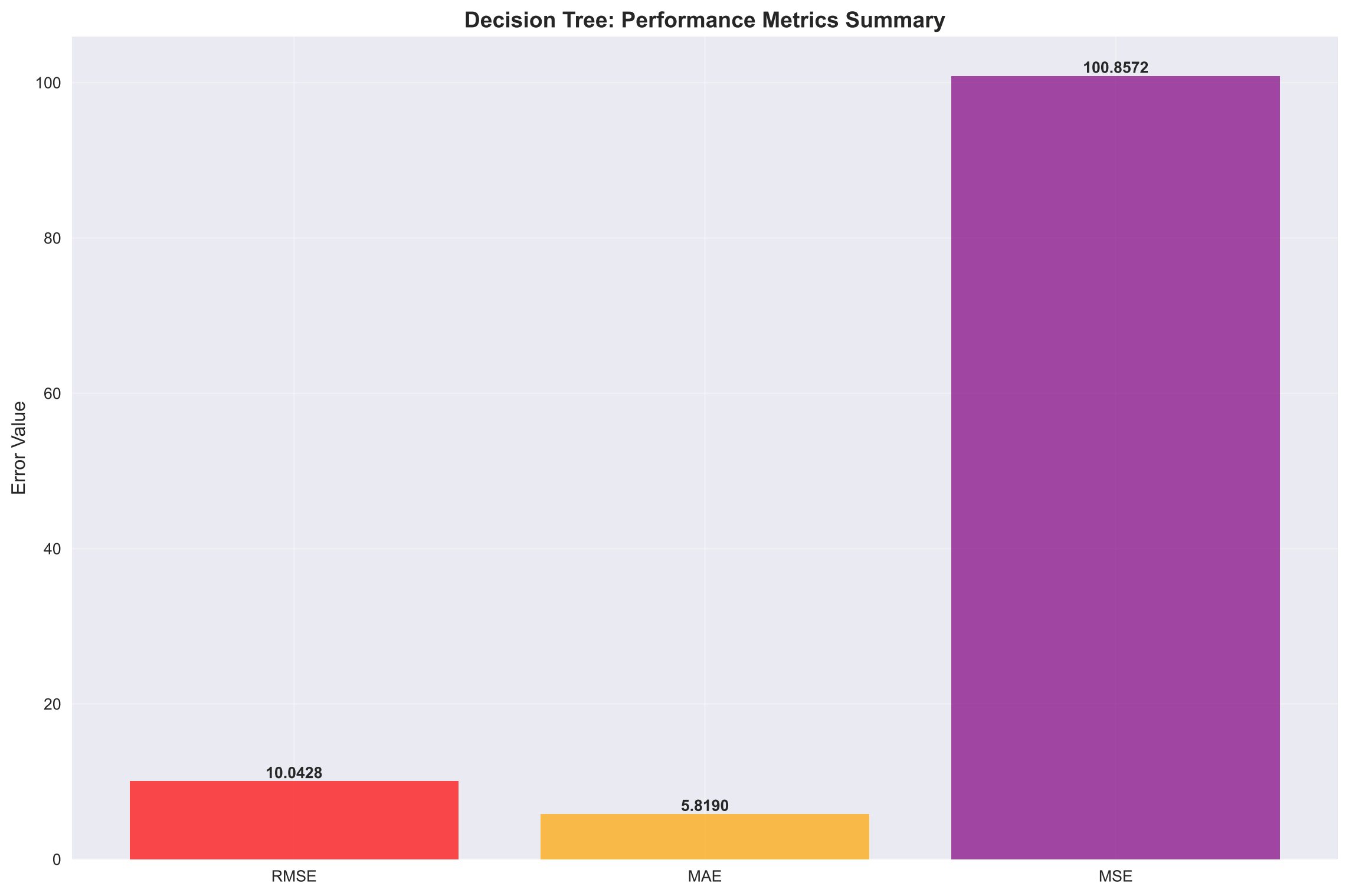

Decision Tree: Actual vs Predicted Values
R² = 0.6628
Predicted Values
Actual Values
10
20
30
40
50
60
70
80


Decision Tree: Residual Plot
Residuals
Predicted Values
30
20
10
0
−10
−20
20
30
40
50
60
70


Distribution of Residuals
Frequency
Residuals
0
2
4
6
8
10
12
14
−20
−10
0
10
20
30

Q-Q Plot of Residuals
Ordered Values
Theoretical quantiles
30
20
10
0
−10
−20
−2
−1
0
1
2


Decision Tree: Feature Importance
Feature Importance
0.25
0.20
0.15
0.10
0.05
0.00
youngs_modulus
scm_flyash
w_b
perc_of_fibre
hrwr_b
tensile_strength
silica_sand
density
aspect_ratio
locally_avail_sand
elongation
cement_opc
Feature Index


Decision Tree: Performance Metrics Summary
Error Value
0
20
40
60
80
100
10.0428
5.8190
100.8572
RMSE
MAE
MSE