KMapSolver3D

Performance Characterization

9-16 Variable Boolean Functions
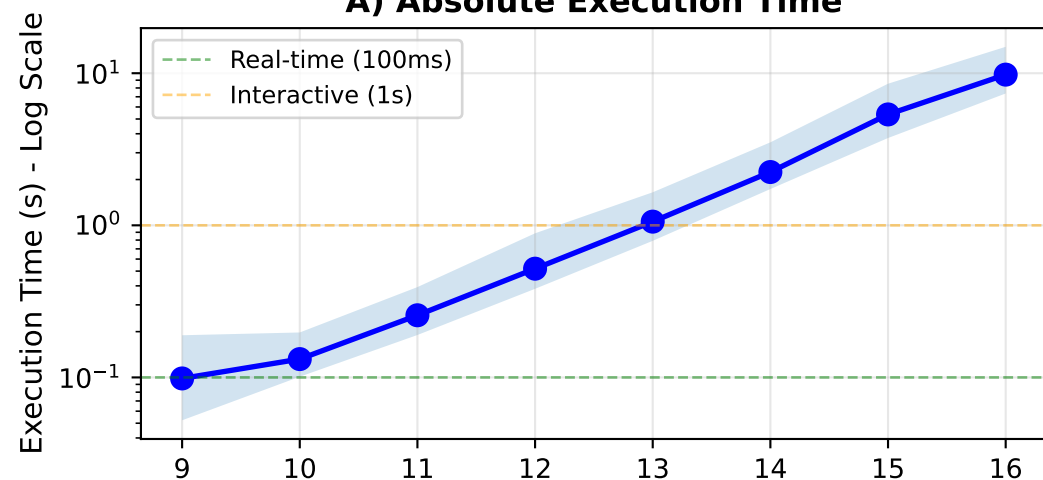
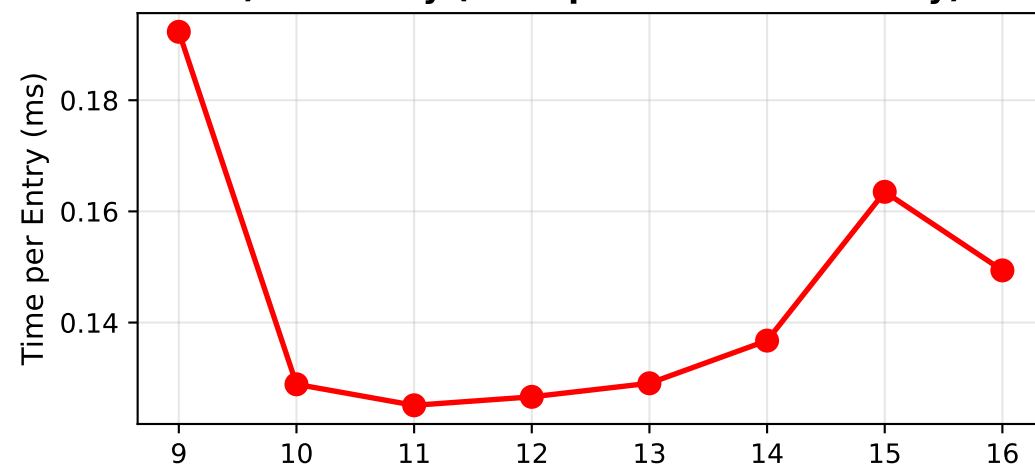Total Tests: 144

Date: 2025-11-29

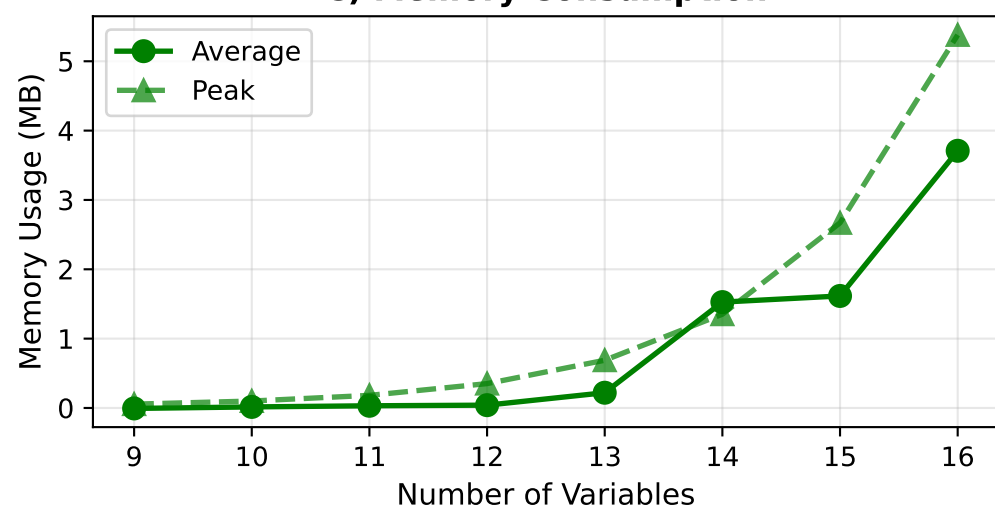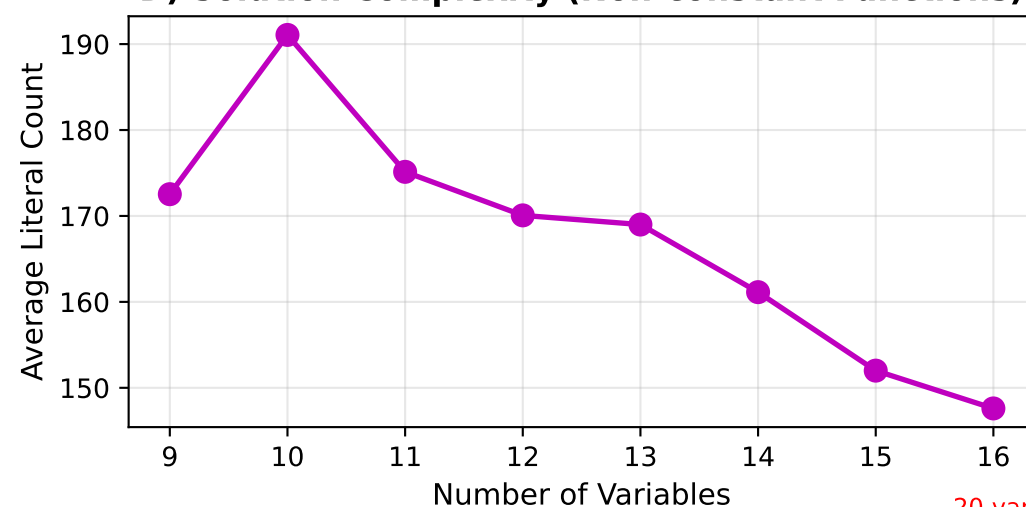**KMapSolver3D Performance Characterization (9-16 Variables)**

A) Absolute Execution Time

- Real-time (100ms)
- Interactive (1s)

B) Efficiency (Time per Truth Table Entry)

C) Memory Consumption

- Average
- Peak

D) Solution Complexity (Non-constant Functions)

E) Exponential Growth Model & Extrapolation

- Measured
- Model: $T \approx 1.45e\text{-}04 \times 2.005^n$

17-var 19.88s
18-var 39.86s
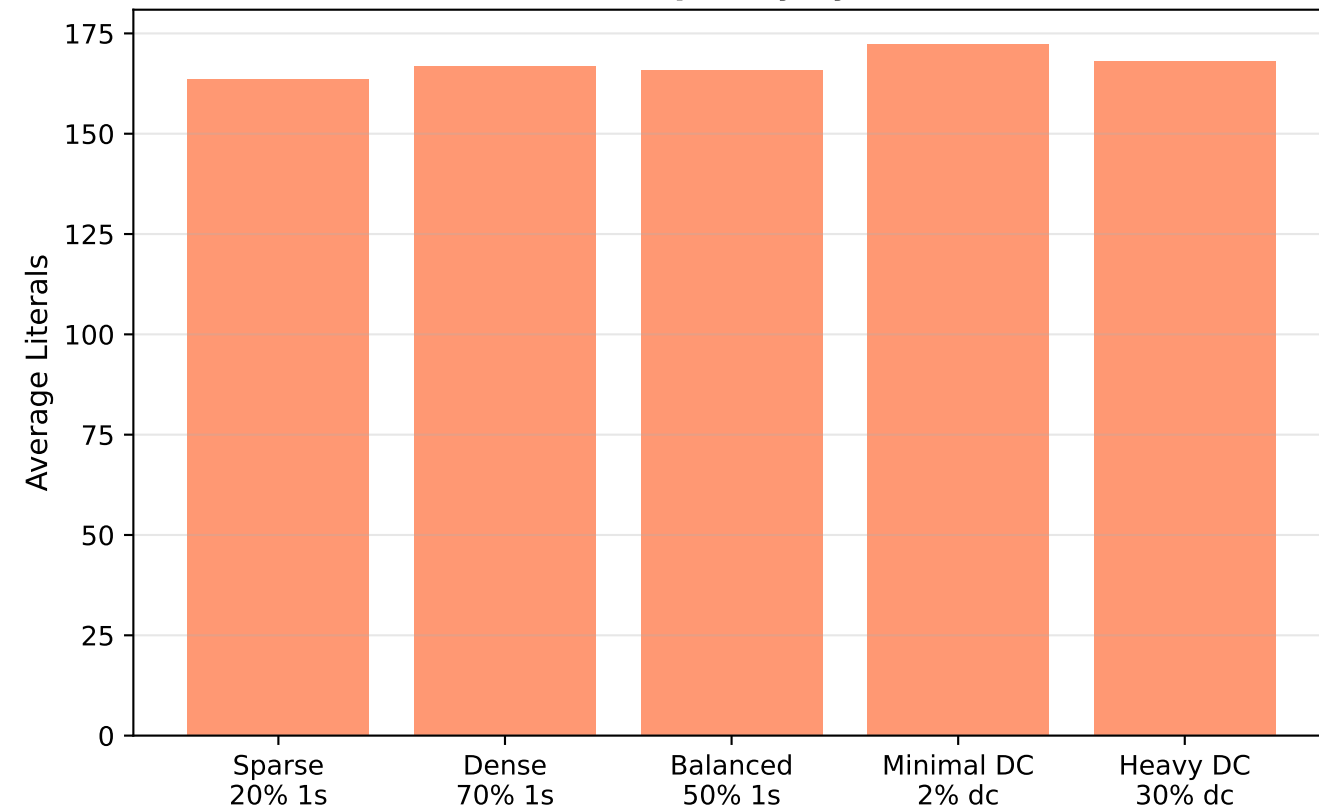19-var 79.94s
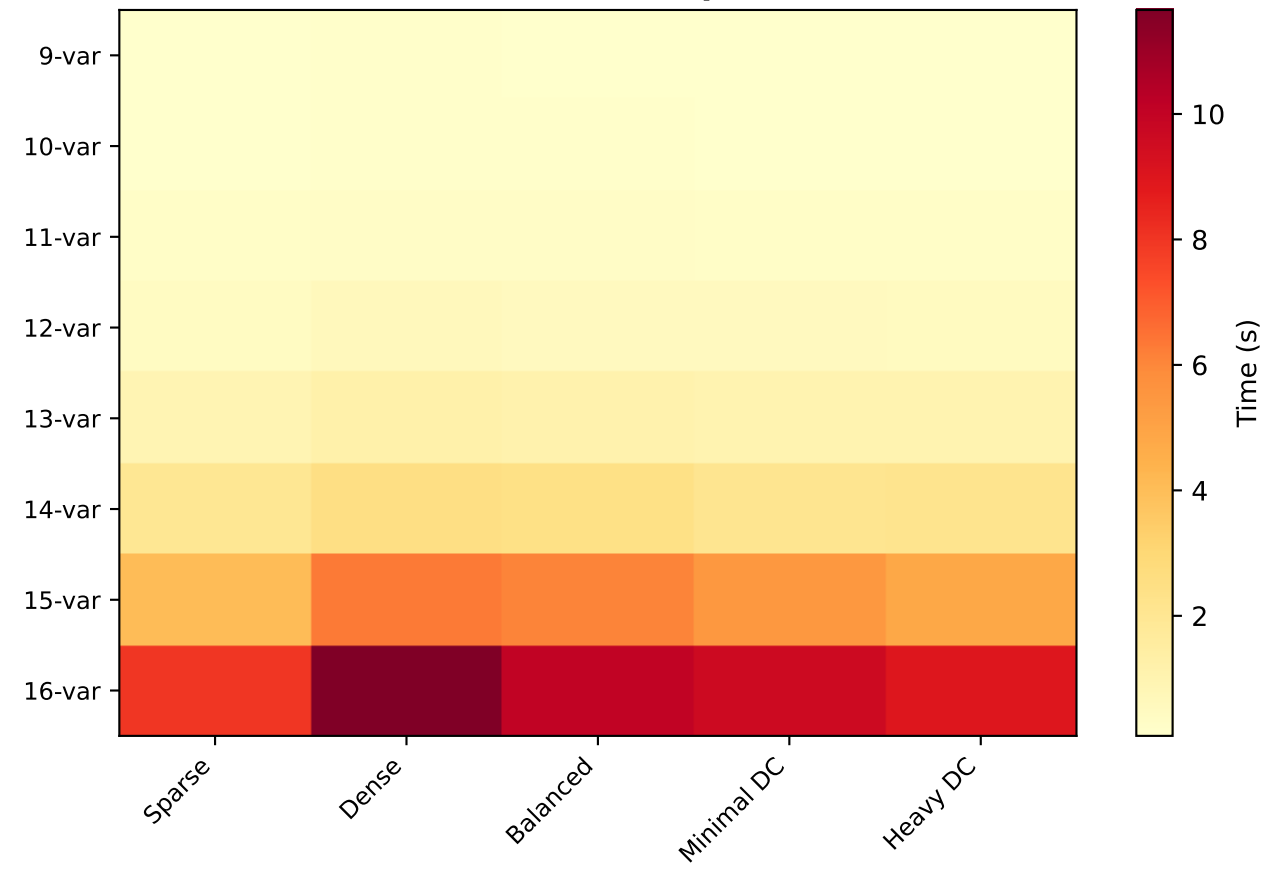20-var 160.31s

Distribution Sensitivity Analysis

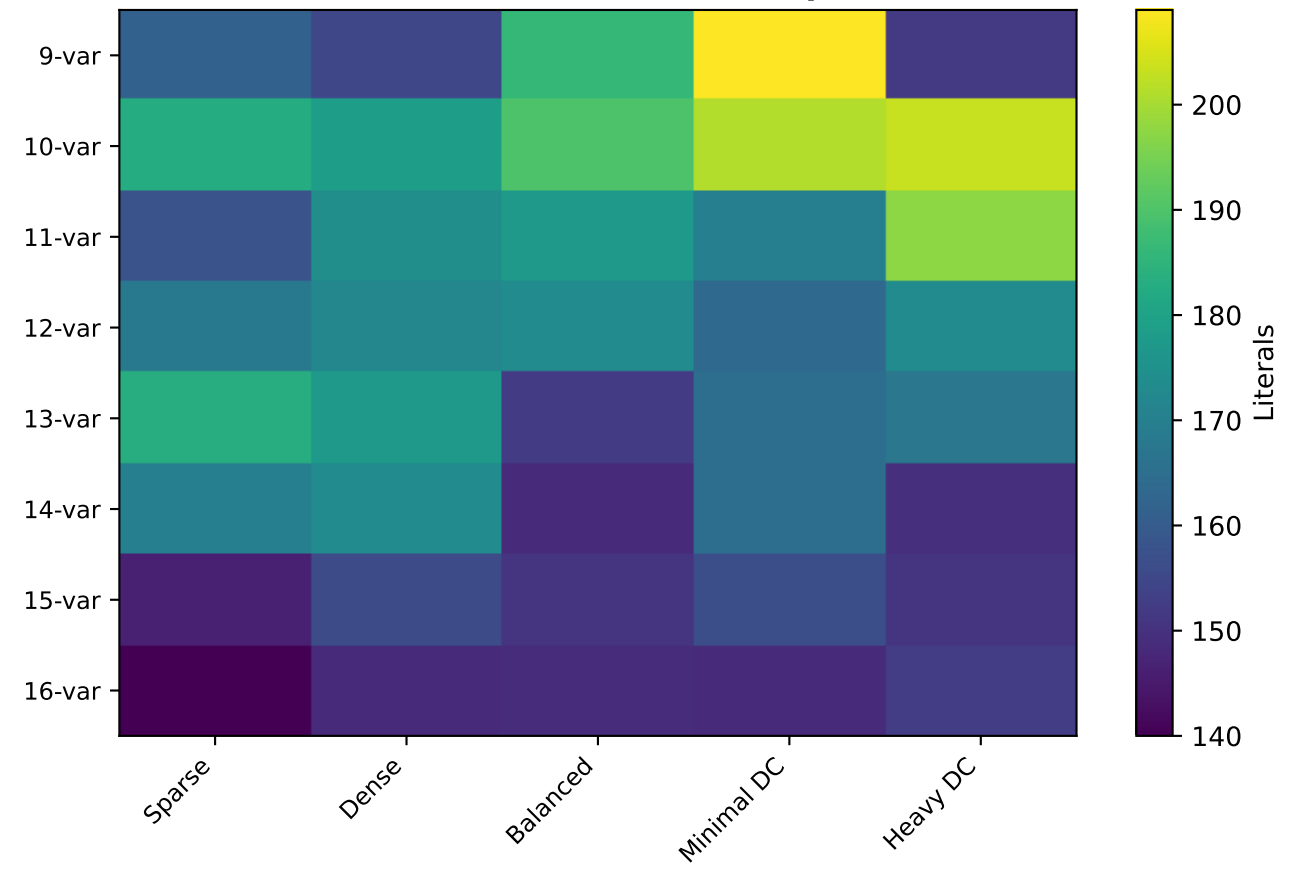**A) Execution Time by Distribution**

B) Solution Complexity by Distribution
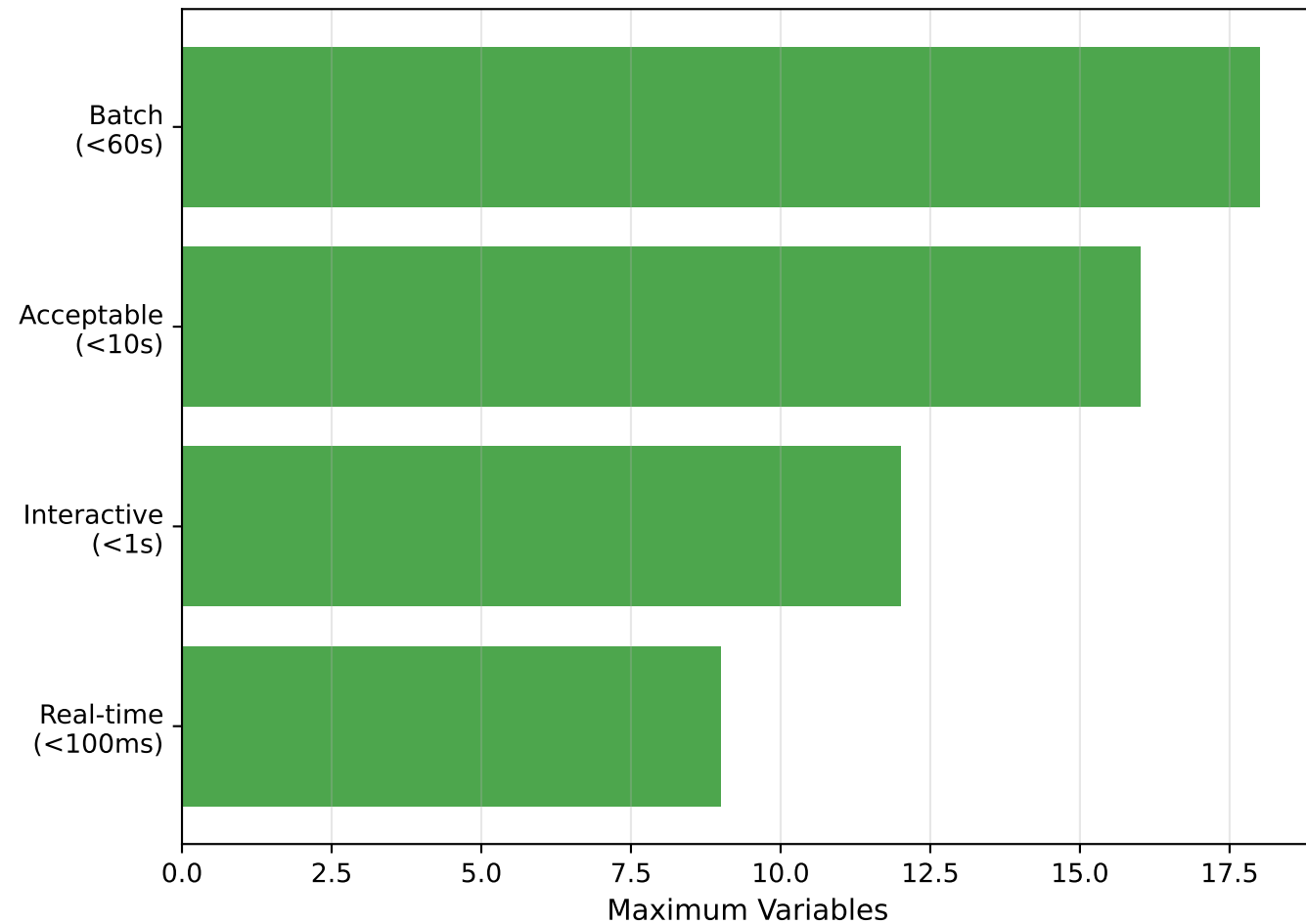
C) Time Heatmap (s)

D) Literal Count Heatmap

Practical Application Limits

A) Practical Performance Limits

B) Performance Projection to 20 Variables