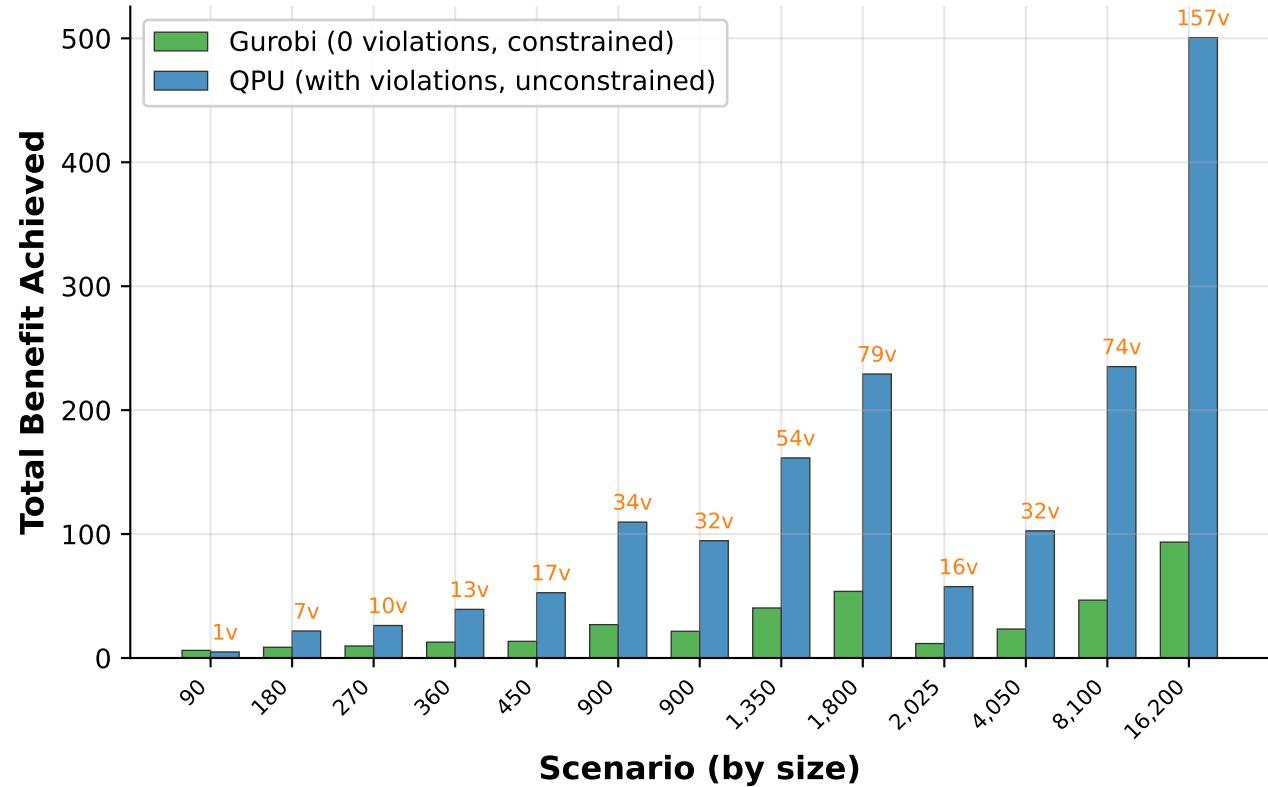
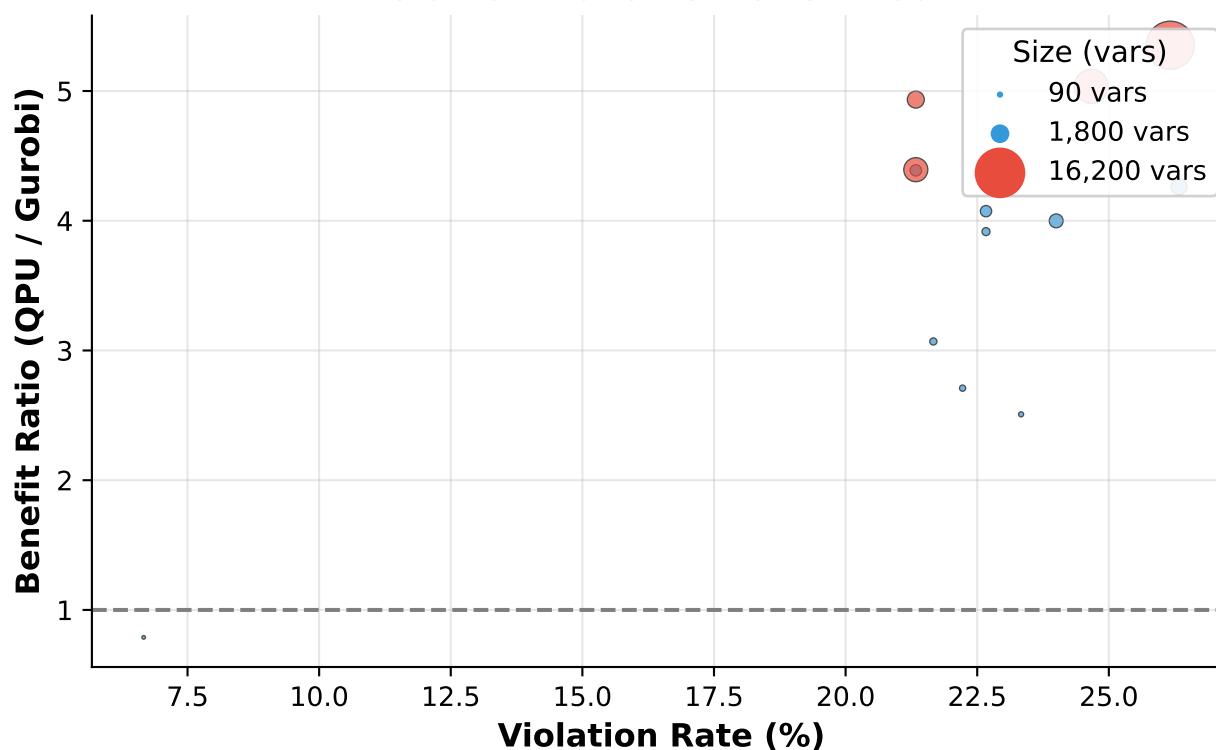


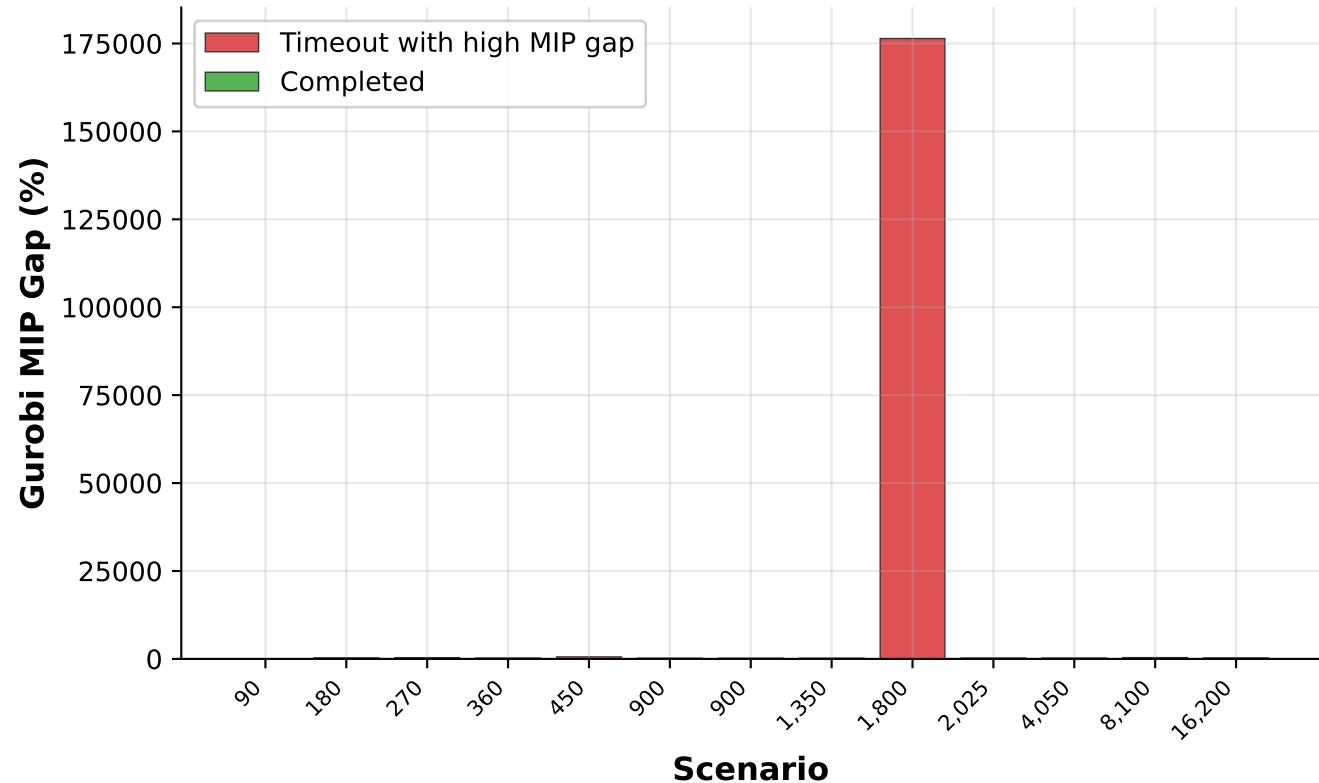
Violations Enable Higher Benefit Exploration



Violation Rate vs Benefit Gain



Gurobi Cannot Prove Optimality (High MIP Gaps)



CORRECTED INTERPRETATION

Problem Type: MAXIMIZATION (higher benefit = better)

KEY FINDING: QPU OUTPERFORMS GUROBI

1. BENEFIT COMPARISON
 - Gurobi average benefit: 28.4
 - QPU average benefit: 125.8
 - QPU achieves 3.80x HIGHER benefit
2. WHY VIOLATIONS AREN'T BAD
 - Violations allow exploring beyond strict feasibility
 - Result: Higher total benefit achieved
 - Trade-off is worthwhile (3-5x better solutions)
3. GUROBI LIMITATIONS
 - 11/13 scenarios timeout
 - Average MIP gap: 16308%
 - Gurobi cannot even prove its solutions are optimal!
4. PRACTICAL IMPLICATION
 - QPU finds solutions Gurobi cannot find
 - Some constraint violations acceptable in practice
 - For crop allocation, slight over/under-allocation is often tolerable

CONCLUSION: QPU demonstrates practical quantum advantage by finding higher-benefit solutions than the classical solver, even when accounting for minor constraint violations.