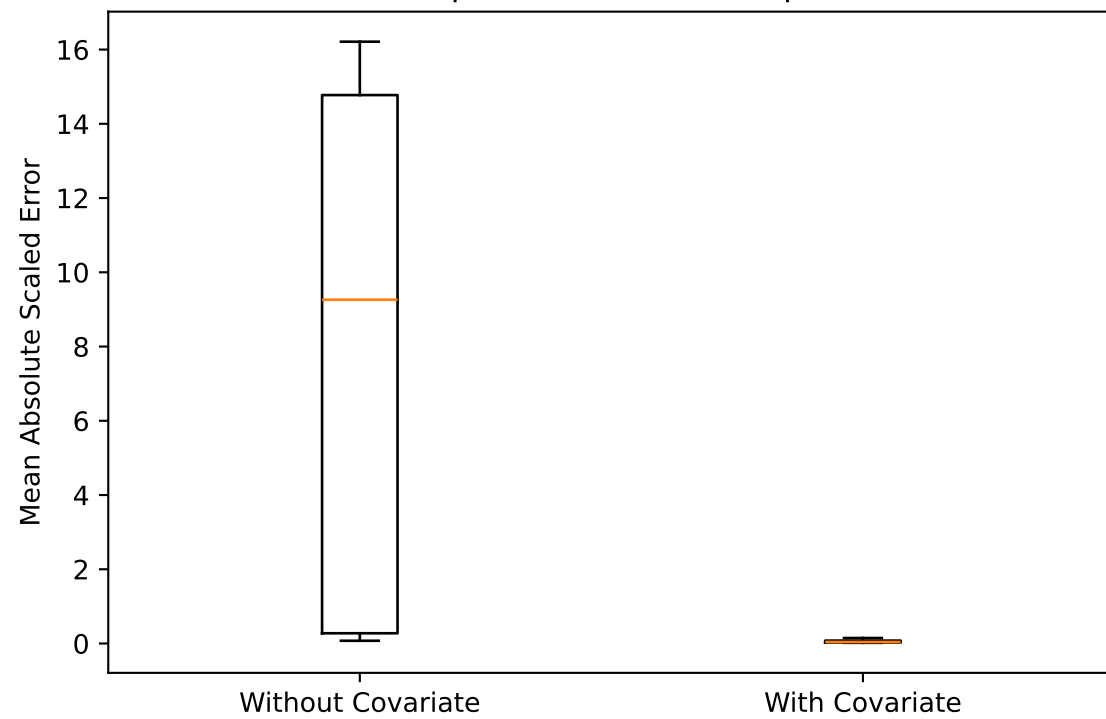
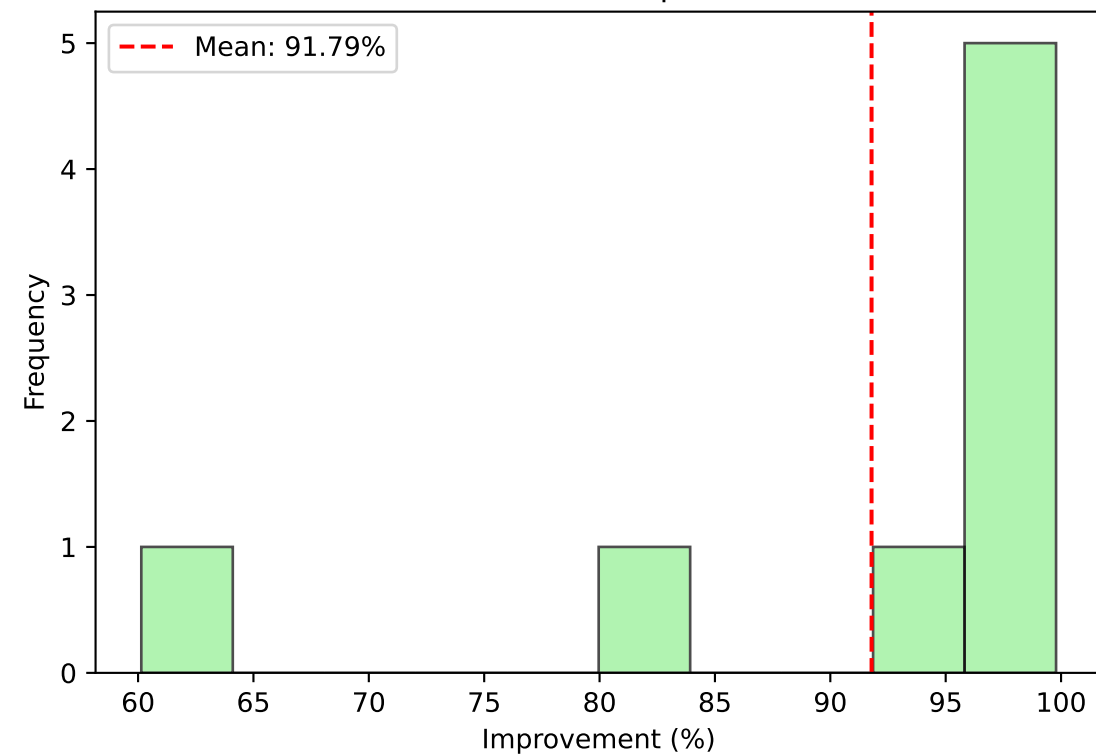


# Covariate Study Summary: Steps

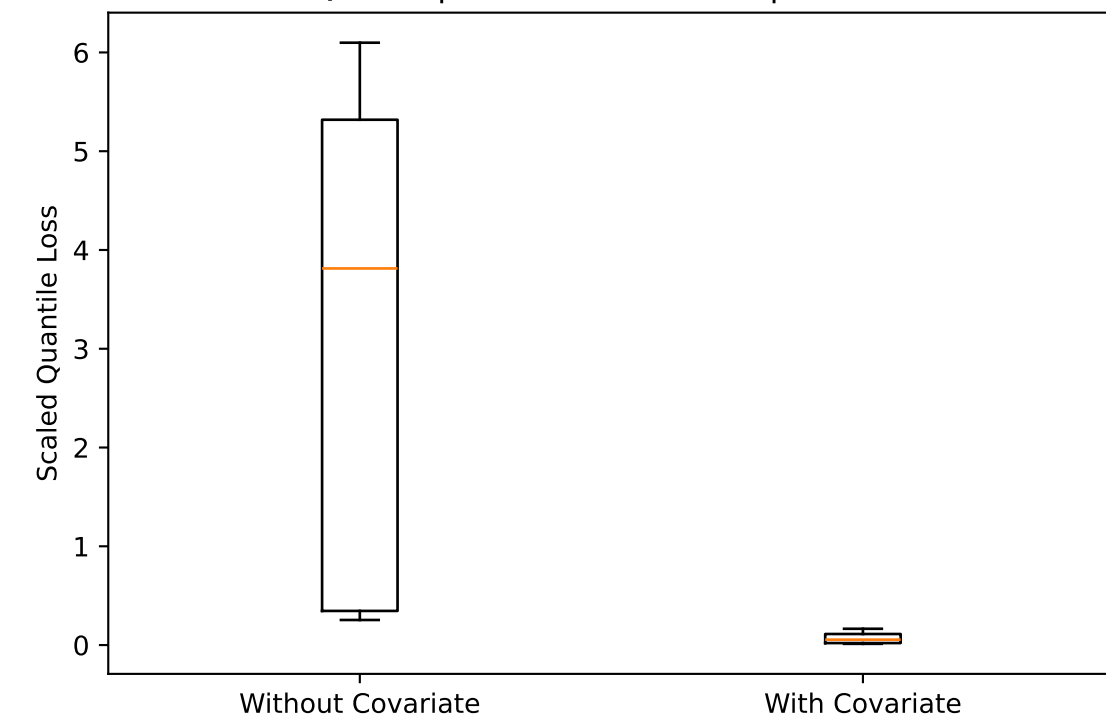
## MASE Comparison Across All Experiments



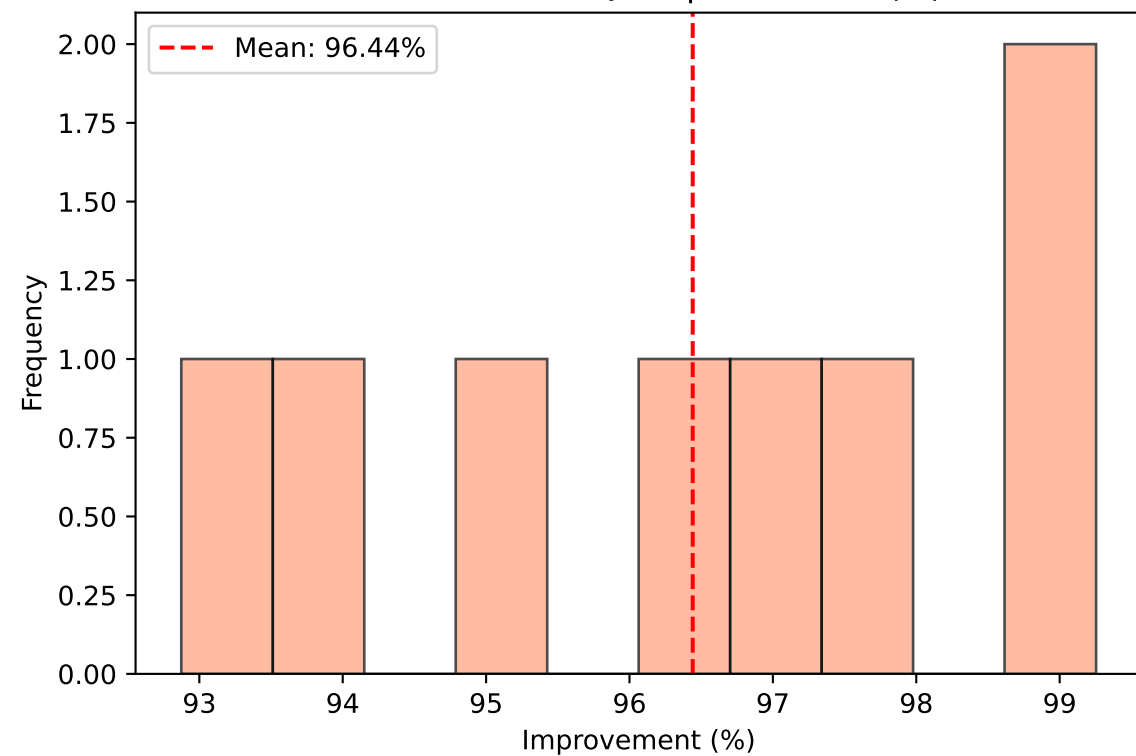
## Distribution of MASE Improvements (%)



## SQL Comparison Across All Experiments



## Distribution of SQL Improvements (%)



## Detailed Statistics

### Covariate Study Detailed Results

Covariate Types: steps

Number of Experiments: 8

#### MASE Results:

- Without Covariate:  $8.1394 \pm 6.6196$
- With Covariate:  $0.0609 \pm 0.0474$
- Average Improvement: 91.79%
- Median Improvement: 98.49%

#### SQL Results:

- Without Covariate:  $3.1650 \pm 2.3276$
- With Covariate:  $0.0694 \pm 0.0526$
- Average Improvement: 96.44%
- Median Improvement: 96.86%

#### Study Parameters:

- Weight: 1.0
- Relation: additive
- Train Ratio: 0.6
- Covariate Weights: Randomized per experiment (Dirichlet distribution)

#### Best Performing Experiment (MASE):

- Experiment 1: 99.78% improvement

#### Worst Performing Experiment (MASE):

- Experiment 3: 60.14% improvement