

CS551 Project Part II

Bit Benders:

Ethan Childs

Michael Dushkoff

Daniel Kutnyi

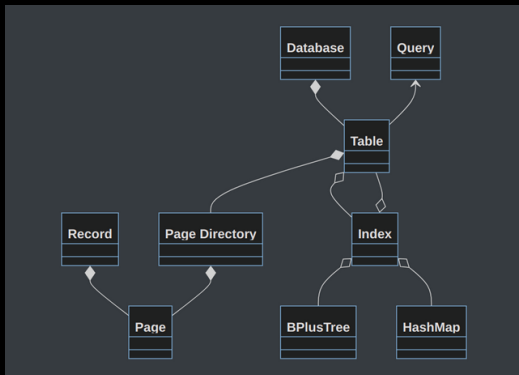
Kai Iverson



University of Oregon
November 19, 2024



Database Architecture Overview



Old Architecture



New Architecture

Unique Architecture Features



- B+Tree Duplicate Key Handling
- Customizable Index
- Customizable Priority Queue
- Parameterised Merge Policy

Creative Optimizations



- Lazy Index Maintenance
- Bulk Insert
- Cache Policies
- Cache Thrashing Prevention
- As-Needed Copying in Merge Algorithm
- List of Dictionaries in Merge Algorithm to Maintain Copy Locations

Bulk Insert



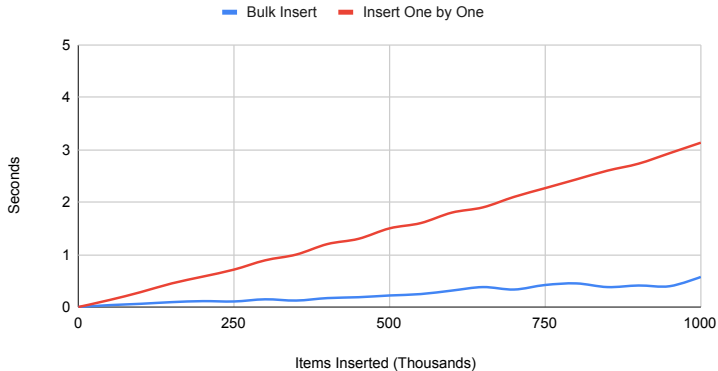
Building a B+Tree; Slowest Case



Bulk Insert



Building a B+Tree; Fastest Case

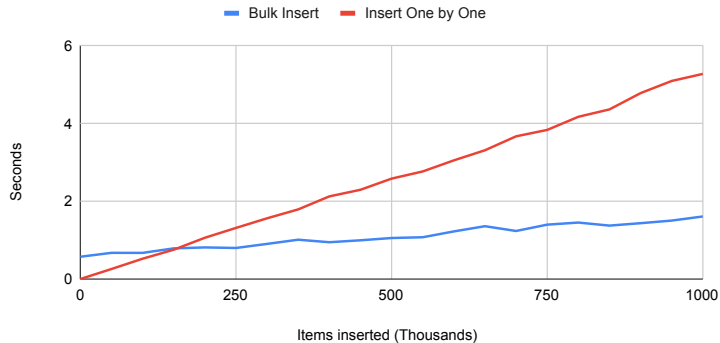


Bulk Insert

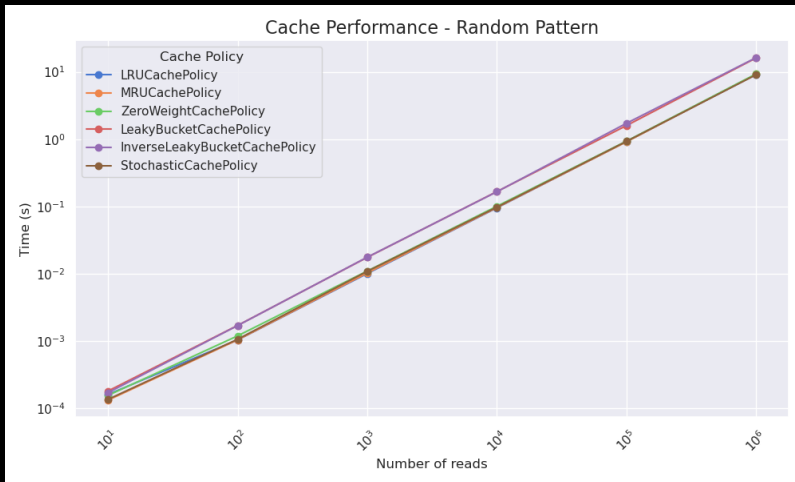


Growing an Existing B+Tree

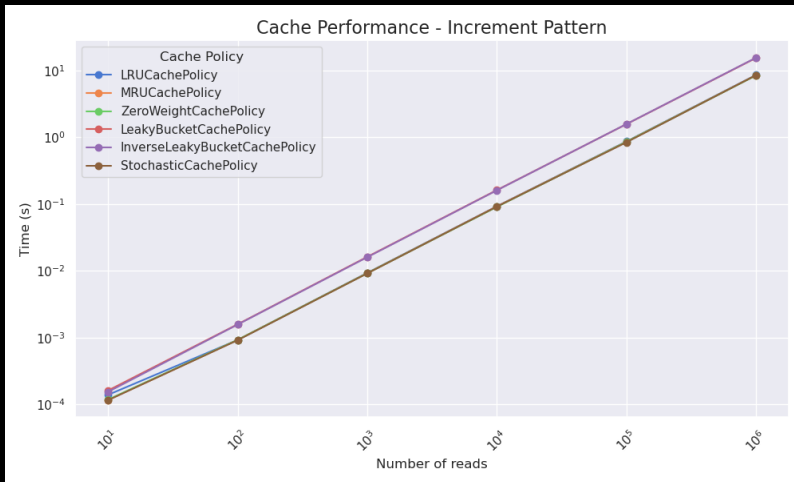
The tree starts with 1,000,000 items



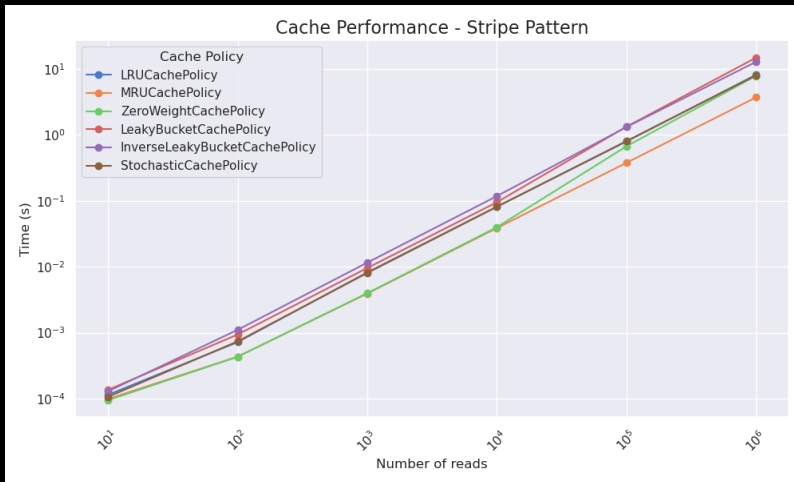
Cache Policies



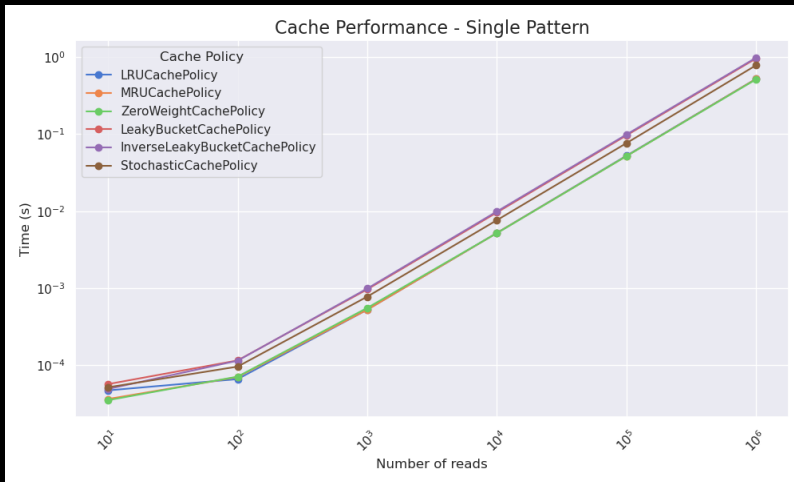
Cache Policies



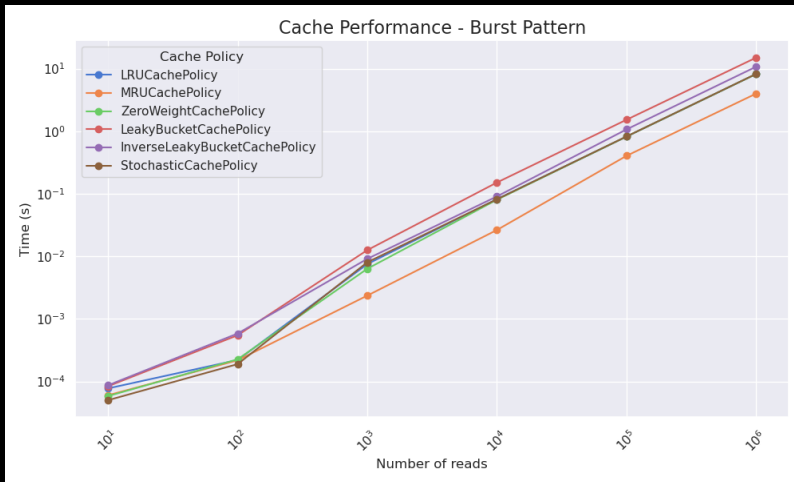
Cache Policies



Cache Policies



Cache Policies



Statistics



Code Statistics

- Lines of Code: 6572
- Tests: 129
- Commits: 194

Questions?