Milestone 2

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- New **PageDirectory** works at the granularity of **PageRanges**
- Two modes, in-memory and on-disk (automatic)
- TLB has been updated to work with **PageRanges**
  - Dirty and Pinned bits
- New **PageAccessor** works with **FileService**, pulling from and writing to disk
Bufferpool (TLB)

- New columns, **Dirty** and **Pinned**
- When an entry is deleted, updated, or added to, it is marked as **Dirty**
- When an entry is being merged, it is **Pinned**
**FileService**

- **DataBase** is read from / written to a single .db file
  - No Pickle used; organized and parsed through from scratch
- **FileService** has 3 Functions:
  - `load_tables`
  - `pull_page_range`
  - `merge_tables`
Merge

- Creates copy of new base page
- Updates the records of the old base page
- All prior tail records marked as deleted
- Old base page also marked as deleted
- Appends the new copy of the base page
Indexing

- **Create_index**
  - Create a new RHash object
  - Scan through all table records and call the index's insert function for the corresponding column

- **Drop_index**
  - Deletes the index of the specified column from memory

- **New seeding scheme**
  - 1% chance to add a seed after an index insert
  - Smallest value is always one of the seeds
  - Max number of seeds is 25% of the total number of records

- **Indices are persisted in the .db file**

![RHash Table]

<table>
<thead>
<tr>
<th>Seeds</th>
<th>Searching for 57-70</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>55</td>
</tr>
<tr>
<td>70</td>
<td></td>
</tr>
</tbody>
</table>

Hashing (55) = 9
Milestone 1 vs Milestone 2

Milestone 1 Performance benchmark
- Insertion time
- Updating time
- Selection time
- Aggregate time
- Deletion time

Milestone 2 Performance benchmark
- Insertion time
- Updating time
- Selection time
- Aggregate time
- Deletion time

System: Ryzen 7 2.9 Ghz with 8MB L3 cache, 16GB ram
Workload: __main__.py
Thank You!