CSE 444: Lab 1 Writeup

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January 17, 2018
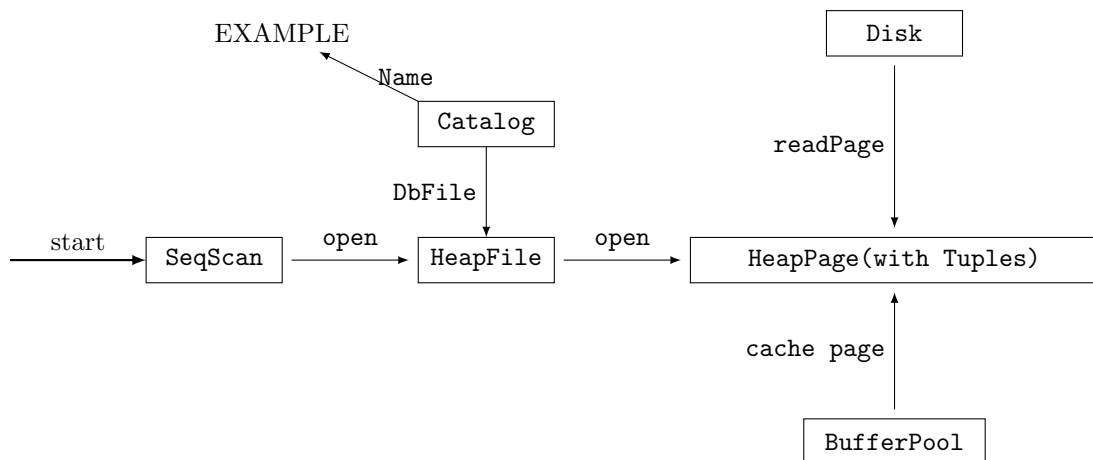
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1. Lab 1 contains necessary methods for constructing databases and operators for query plan execution (just reading from file in Lab 1 with `SeqScan`). Key componants implemented are:

- `Tuple`: this presents a single record (row) in a relation
- `TupleDesc`: this defines the schema of a relation (the number of fields,)
- `Catalog`: this stores information of all relations (tables) currently in the database, including the file, name, and the name of the primary key
- `BufferPool`: this caches the pages recently read by `DbFile` for good locality performance
- `HeapPage`: this stores the actual data (`byte` array) stored in a page
- `HeapFile`: this represents a file stored on disk as a collection of `HeapPage`
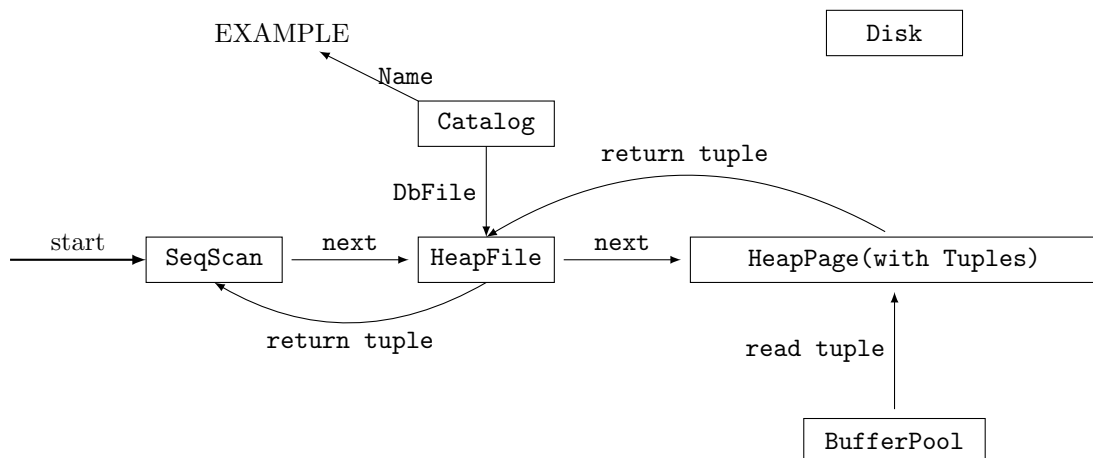- `SeqScan`: this implements sequential scan operator for reading from tuples from `HeapFile`

Putting them together, the workflow of a simple reading query is
SQL Query: `SELECT * FROM EXAMPLE`

Workflow (`open()`):

Workflow (`next()`):

2. Design decisions: I followed the instructions in README and didn't make extra design decisions.

3. Extra Unit tests: A unit test for the correctness of `HeapPage.iterator()` would be nice. My initial implementation was wrong because I include the tuples in the empty slot, but the unit tests in `HeapPageIdTest` and `HeapPageReadTest` did not catch this error. It only showed up when I run `ScanTest` after finishing everything, and it was a little hard to connect the dots back to this method.

4. Changes to API: I did not make changes to the APIs given.

5. Missing elements: I believe I finished the entire Lab 1