

## 1.Design decision &API

EX1 在代码 todo 部分补写，实现 tuple 相关功能

在 Tuple.java 添加: **private** TupleDesc tupleDesc;**private** RecordId recordId;**private** final Field[] fields;

在 TupleDesc.java 添加:**private** TDItem[] tdlItems; TupleDesc 定义了 Tuple 结构, 一个 TDItem 类型的数组, 一个 TDItem 对象包括 fieldType 和 fieldName 两个属性。

```
C:\Users\Lenovo\Desktop\acmdb-lab0>ant runtest -Dtest=TupleDescTest
Buildfile: C:\Users\Lenovo\Desktop\acmdb-lab0\build.xml

compile:
testcompile:
runtest:
[junit] Running simpledb.TupleDescTest
[junit] Testsuite: simpledb.TupleDescTest
[junit] Tests run: 6, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.049 sec
[junit] Tests run: 6, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.049 sec
[junit]
[junit] Testcase: combine took 0.014 sec
[junit] Testcase: getType took 0.001 sec
[junit] Testcase: getSize took 0.001 sec
[junit] Testcase: numFields took 0 sec
[junit] Testcase: nameToId took 0.009 sec
[junit] Testcase: testEquals took 0.001 sec

BUILD SUCCESSFUL
Total time: 1 second
```

```
C:\Users\Lenovo\Desktop\acmdb-lab1>ant runtest -Dtest=TupleTest
Buildfile: C:\Users\Lenovo\Desktop\acmdb-lab1\build.xml

compile:
testcompile:
runtest:
[junit] Running simpledb.TupleTest
[junit] Testsuite: simpledb.TupleTest
[junit] Tests run: 3, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.024 sec
[junit] Tests run: 3, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.024 sec
[junit]
[junit] Testcase: getTupleDesc took 0.008 sec
[junit] Testcase: modifyFields took 0.002 sec
[junit] Testcase: modifyRecordId took 0.001 sec

BUILD SUCCESSFUL
Total time: 1 second
```

EX2 Catalog 类需要实现添加新表, 以及从特定的表中提取信息的功能。

添加: **public** final DbFile dbFile; **public** final String tableName; **public** final String pk;

```
C:\Users\Lenovo\Desktop\acmdb-lab0>ant runtest -Dtest=CatalogTest
Buildfile: C:\Users\Lenovo\Desktop\acmdb-lab0\build.xml

compile:
testcompile:
runtest:
[junit] Running simpledb.CatalogTest
[junit] Testsuite: simpledb.CatalogTest
[junit] Tests run: 5, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.079 sec
[junit] Tests run: 5, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.079 sec
[junit]
[junit] Testcase: handleDuplicateIds took 0.01 sec
[junit] Testcase: handleDuplicateNames took 0.043 sec
[junit] Testcase: getDatabaseFile took 0.001 sec
[junit] Testcase: getTupleDesc took 0 sec
[junit] Testcase: getTableId took 0.001 sec

BUILD SUCCESSFUL
Total time: 4 seconds
```

EX3 bufferpool 需要实现构造器和实现 BufferPool.getPage()方法, BufferPool 存取最多 numPages 个物理页.

添加: **private** final int numPages; **private** final ConcurrentHashMap<Integer,Page> pageStore;

```
C:\Users\Lenovo\Desktop\acmdb-lab0>ant runtest -Dtest=HeapPageIdTest
Buildfile: C:\Users\Lenovo\Desktop\acmdb-lab0\build.xml

compile:
testcompile:
runtest:
[junit] Running simpledb.HeapPageIdTest
[junit] Testsuite: simpledb.HeapPageIdTest
[junit] Tests run: 4, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.024 sec
[junit] Tests run: 4, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.024 sec
[junit]
[junit] Testcase: equals took 0.006 sec
[junit] Testcase: getTableId took 0.001 sec
[junit] Testcase: pageNo took 0 sec
[junit] Testcase: testHashCode took 0 sec

BUILD SUCCESSFUL
Total time: 2 seconds
```

```
C:\Users\Lenovo\Desktop\acmdb-lab0>ant runtest -Dtest=HeapPageReadTest
Buildfile: C:\Users\Lenovo\Desktop\acmdb-lab0\build.xml

compile:
testcompile:
runtest:
[junit] Running simpledb.HeapPageReadTest
[junit] Testsuite: simpledb.HeapPageReadTest
[junit] Tests run: 4, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.035 sec
[junit] Tests run: 4, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.035 sec
[junit] Testcase: getId took 0.014 sec
[junit] Testcase: getSlot took 0.001 sec
[junit] Testcase: testIterator took 0.002 sec
[junit] Testcase: getNumEmptySlots took 0.002 sec

BUILD SUCCESSFUL
Total time: 3 seconds
```

## EX4 Heap

添加: **private** final int tableId; **private** final int pgNo; (页序号)

在 RecordID 里面添加: **private** final PageId pid; **private** final int tupleno

EX5 在 Heapfile 添加: **private** final File file; **private** final TupleDesc td;

```
C:\Users\Lenovo\Desktop\acmdb-lab0>ant runtest -Dtest=HeapFileReadTest
Buildfile: C:\Users\Lenovo\Desktop\acmdb-lab0\build.xml

compile:
testcompile:
runtest:
[junit] Running simpledb.HeapFileReadTest
[junit] Testsuite: simpledb.HeapFileReadTest
[junit] Tests run: 6, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 1.475 sec
[junit] Tests run: 6, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 1.475 sec
[junit] Testcase: getId took 1.415 sec
[junit] Testcase: testIteratorBasic took 0.014 sec
[junit] Testcase: testIteratorClose took 0.013 sec
[junit] Testcase: numPages took 0.004 sec
[junit] Testcase: readPage took 0.007 sec
[junit] Testcase: getTupleDesc took 0.003 sec

BUILD SUCCESSFUL
Total time: 3 seconds
```

## EX6 Operators

在 SeqScan 添加: **private** final TransactionId tid; **private** int tableId; **private** String tableAlias;  
**private** DbFileIterator it;

```
C:\Users\Lenovo\Desktop\acmdb-lab1>ant runsystest -Dtest=ScanTest
Buildfile: C:\Users\Lenovo\Desktop\acmdb-lab1\build.xml

compile:
testcompile:
runsystest:
[junit] Running simpledb.systemtest.ScanTest
[junit] Testsuite: simpledb.systemtest.ScanTest
[junit] Tests run: 3, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 1.82 sec
[junit] Tests run: 3, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 1.82 sec
[junit] Testcase: testRewind took 1.388 sec
[junit] Testcase: testCache took 0.138 sec
[junit] Testcase: testSmall took 0.277 sec

BUILD SUCCESSFUL
Total time: 3 seconds
```

Query test,在 src 下面加入一个 test.java 文件, 内容为 readme 文件提供代码方法, 读取文件名是 data.txt 然后进行转换

```
C:\Users\Lenovo\Desktop\acmdb-lab0>java -classpath dist/simpledb.jar simpledb.test
1 1 1
2 2 2
3 4 4
C:\Users\Lenovo\Desktop\acmdb-lab0>
```

3.time spent:连续多天, 加起来约 20h