Report

Methods implemented :

**Problem 1 :**

I have implemented the the getType(int i) and toString() methods of the TupleDesc class.

For getType(int i) I returned the value of type array in which all the types are there from Type.java.

For toString() method, I implemented using StringBuffer. We have different strings of Field type and Field name so appending it in one string using StringBuffer and converting by toString().

Also, I have implemented the toString() methods of the Tuple class.

For toString() method, I implemented using StringBuffer. In which we are appending the tuples represented by String in one string using StringBuffer and converting to String by toString().

**Problem 2 :**

In this problem, I implemented getTableId(String) method, getTupleDesc(int) method and getDbFile(int).

getTableId(String) accepts the name of the table and returns the specified id of the table. I am using the .containsKey(obj) method of the Hash Table and look for the specified name in hash map called name2tableID : HashMap<String, Integer>.

getTupleDesc(int) accepts the id of the table and returns the Tuple Desc Schema. I am using the .containsKey(obj) method of the Hash Table and look for the specified id in hash map called tableID2desc : HashMap<Integer, TupleDesc>.

getDbFile(int) accepts the id of the table and returns the DB File to read the contents. I am using the .containsKey(obj) method of the Hash Table and look for the specified id in hash map called tableID2dbFile : HashMap<Integer, DbFile>.

**Problem 3 :**

In this problem, I have implemented the getPage(TransactionId, PageId, Permissions) method. In which, Checking whether the pages hashtable contains the pid in its key pairs. If contains then simply return the page associated with that pid. Else, read the page from DBFile.

**Problem 4:**

In this problem , I have implemented 4 methods.

* entryCount() : Returning the number of Tuples in the HeapPage.
* tupleLocation(int) : Returning the Particular location of Tuple. Here, First 4 bytes shows the first block which contains Total number of Tuples. Then, To move to Tuple for entryID we have to go 4 times to entryID as each block is of 4 bytes.
* getTuple(int) : This method returns the tuple at Specified entry. First I am checking whether the Tuple ID value is greater than zero and less than total entry count. If yes, then just find that tuple else return null.
* iterator() : Making List of type Tuples as we have to iterate through each of them. Then calling the java Iterator() method of Iterator<E> interface.

**Problem 5 :**

In this problem, I have implemented two methods.

* readPage(PageId) : In this method it returns the HeapPage using the PageId passed to the method. Here, We are using RandomAccessFile class of Java to move your disk arm directly to the memory location we wanted.
* iterator(TransactionId) : This is the DBFileIterator. In which We are iterating through the tuple of each page in HeapFile. We are using hasnext() and next() method. The iterator must use the getPage(TransactionId, PageId, Permissions) of the BufferPool.java.

**Problem 6 :**

In this Problem, I have to implement two methods called deleteTuple(Tuple) and addTuple(Tuple).

I have implemented the addTuple() method and it works fine if I run the HeapPageWriteTest() method. In the addTuple(Tuple) method, First we are finding the location where we can add tuple and then saving the entry of Tuple using saveTupleLocation(int, int) method.

I tried to implement the deleteTuple(Tuple) method but I couldn’t make a successful run of this. I tried to write the details at location in HeaPFile, deleteNonexistentTuple(Tuple t) is working fine but deleteTuple(Tuple t) is getting failed and giving arrayIndexOutofBoundsException().

I spent daily half an hour daily for this assignment.