CS 499 – Distributed Systems  
Wednesday, September 30, 2009

Class Notes:

* Quiz 3 – Global State Predicates
  + example of stable
  + example of unstable
  + Snapshot algorithm 🡪 it allows you to draw conclusion on …

Lecture Notes:

* ACID
  + Atomicity
  + Consistency
  + Isolation
  + Durability
* ACID
  + Banking example:
    - Operation of the Account interface
      * deposit (amount)
      * withdraw(amount)
      * getBalance( ) 🡪 amount
      * setBalance(amount)
    - Operations of the Branch interfaced
      * create(name) 🡪 account
      * lookup(name) 🡪 account
      * branchTotal( ) 🡪 amount
    - CORIDORNATOR INTERFACE
      * openTransaction( ) 🡪 trans
      * closeTransactions(trans) 🡪(commit, abort)
      * abortTransaction(trans)
    - Notes
      * the goal is to produce as many transactions as possible
      * easy to guarantee consistency 🡺 serialize the transactions
        + but to strictly serialize is not the solution
  + Quick look at what a transaction example:
    - **SUCCESSFUL**  
      openTransaction  
      *operation  
      operation*  
      .  
      .  
      *operation*  
      closeTransaction
    - **Aborted by client**openTransaction  
      *operation  
      operation  
      .  
      .  
      operation*  
      abortTransaction
    - **Aborted by Server**openTransaction  
      *operation  
      operation  
      .  
      . //server aborts transaction  
      .  
      operation ERROR*  
      reported to client
    - Options for the Client:
      * Start over
    - Why was aborted?
* Concurrency Control:
  + Example: “Lost update problem”:
    - two transactions T and U
    - Order of operations leads to conflict
    - Solution would be for all of one transaction segment to complete first before the other.
  + Example: “Inconsistent Retrieval”:
    - Transactions V and W
    - Solution was to serialize all of the transaction
* Serial Equivalence
  + // this is to provide the solutions to the above examples above

TODO: