Overview

- series of steps viewed as atomic unit
 - either fully executed or not
- · transactions can be fully committed or rolled back in case an error occurs
 - includes [[Logging and Recovery]]
- transforms database from consistent state into another consistent state
 - via [[Locking and Concurrency Control]]
- transaction satisfy [[ACID]] properties
 - dependent on [[Transaction Isolation Level]]

[[SQL]] Transaction Examples

```
START TRANSACTION ISOLATION LEVEL SERIALIZABLE:
nple
                            UPDATE Account SET Balance=Balance-100
Transfer 100 Euros from
                                WHERE AID = 107;
Account 107 to 999
                            UPDATE Account SET Balance=Balance+100
                                WHERE AID = 999;
                         COMMIT TRANSACTION;
                                                      #1 Isolation level (defined
   Terminology
                      #2 Start/begin of TX (BOT/BT)
                                                       by addressed anomalies)
     by Example
                           START TRANSACTION ISOLATION LEVEL SERIALIZABLE;
                              UPDATE Account SET Balance=Balance-100
  #3 Reads and writes of
                                 WHERE AID = 107;
       data objects
                              UPDATE Account SET Balance=Balance+100
                                 WHERE AID = 999;
                                                                  #6 Savepoints
                              SELECT Balance INTO lbalance
                                                                  (checkpoint for
                                 FROM Account WHERE AID=107;
                                                                 partial rollback)
  #4 Abort/rollback TX
                              IF lbalance < 0 THEN</pre>
   (unsuccessful end of
                                 ROLLBACK TRANSACTION;
                                                          #5 Commit TX
   transaction, EOT/ET)
                                                        (successful end of
                           COMMIT TRANSACTION;
```