CS348 Midterm Review Chapter 1

Chapter 1:
database:
- a collection of data.
- activities of one or more related organizations.
- Entities && Relationships

data model: collection of high-level data description constructs that hide many low-level storage details(based on relational data model)

semantic data model: more abstract, high-level

relation: a set of records

schema: a description of data in terms of a data model. the name, the name of each field, the type of each field.

indexes: file organizations to use to store the relations and create data structures.

transaction: anyone execution of a user program in a DBMS. No partial transaction. (key words: concurrent, interrupted before running to completion(crash))

Advantages of DBMS:
- **Data Independence(最重要，achieved through three abstractions）**
- Efficient Data Access
- Data Integrity and Security
- Data Administration
- Concurrent Access and crash recovery
- Reduced Application Development Time

Disadvantages of DBMS:
1. not adequate for certain applications
2. application may need to manipulate the data in ways not supported by the query language

Levels of Abstraction in DBMS:(three)
1. conceptual (DDL): the stored data in terms of the data model of the DBMS(all relations)
2. physical (all DBMS): additional storage details. summarize how the relations described in the conceptual schema.

3. external (DDL): allow data access to be customized at the level of individual users or groups of users

physical最底层，conceptual像table

Queries languages包括：
1. relational calculus
2. relational algebra

DBA:
1. Design of the conceptual and physical schemas
2. security and authorization
3. data availability and recovery from failures
4. database tuning