Daniel Crawford
Database Systems (CS 4347.002)
Pushpa Kumar

3.3)
Entity: A thing or object in the real world with an independent existence.
Attribute: The particular properties that describe an entity.
Value: Associated with the attribute, it is a constant which represents the attribute.
Relationship: Relates two or more distinct entities with a specific meaning.
Instance:
Composite Attribute: Can be divided into smaller subparts, which represent more basic attributes with independent meanings.
Multivalued Attribute: An entity may have multiple values for an attribute.
Derived Attribute: When the value of an attribute can be determined from the values of one or more attributes.
Complex Attribute: Composite and Multi-valued attributes may be nested arbitrarily to any number of< levels.
Key Attribute: An attribute for an entity type for which each entity must have a unique value.
Value set(domain): Specifies the set of values associated with an attribute.

3.4)
An entity type is entities with the same basic attributes merged into one. For example, an entity type can be employee, where its attributes are name, age and salary. An entity set holds these entity types as a collection which is stored in the database. It is the current state of the entities that type that are stored in the database. So an entity is a general object in the world or thing, and an entity type is related to that entity, however it has attributes associated with it. Finally, the entity set holds these entity types as a collection into the database.

3.6)
A relationship type is when relationships of the same type are grouped or typed together. In a database, this could be a WORKS_ON relationship in which both the employee and the project are participating. In a relationship set, every entity is related to another entity by a relation type. This then defines a set of associations among entities from these entity types.

3.11)
By definition a recursive relationship type is a relationship type between the same participating entity type in distinct roles. A good example of this is a relation between two employees, the SUPERVISE relationship. In this case, employee is related to another employee because they supervise them through their job. This could be something like a senior developer supervising an intern. Another example a relationship of Member to a university and the TEACHES relationship. In a university, both a professor and a student are members of a university. However, some members teach student members, therefore this relationship would be recursive.

3.12)
A weak entity is an entity that does not have a key attribute whose identification is dependent on another entity type. This can be helpful because it can reduce the amount of data really needed for some entities which do not need as much information. This means if you had an EMPLOYEE entity, and there was a DEPENDENT attached, it could use the employee as the identifier instead of having an attribute which connected the two together. An owner entity type is the entity type which has an

identifier and which the weak entity type is using as its identifier. The owner entity type is a strong entity type which has an identifying relationship with the weak entity type. The identifying relationship type is the relationship that relates a weak entity type to its owner. Finally, a partial key is an identifier that can uniquely identify weak entities that are related to an owner identity.

3.19)

- Airport
  - This is what the entire database is representing
  - Airports have a Airport_code, city, state and name
  - Airport_code is used to uniquely identify the airport
- Flight
  - Used to identify where the final destination is
  - Each flight is identified by a number, and it has an airline and weekdays
- Flight Legs
  - A flight is made of 1 to N of these.
  - Flight legs have a Departure airport with a scheduled departure time, and they also have an arrival airport with a scheduled arrival time.
  - Flight legs have leg numbers to weakly identify them.
- Leg Instance
  - This is an instance of a flight leg on a specified date.
  - The final arrival and departure airports are reported after they have landed. Also the times are recorded.
  - Leg instance holds the date of a flight leg.
- Reservations
  - Simply holds the customer name, phone number and seat number of a customer.
- Airplanes and Airplane Types
  - An airplane type holds the company which owns the plane, is identified by its type name and has a value for maximum number of seats allowed.
  - An airplane then has an unique ID to it and the total number of seats it can support.