WEEK4

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- A database is an organized collection of inter-related data that models some aspect of the real-world.

- Issues with Flat File:

• Data Integrity (Entity, Domain, Referential)

• Implementation

• Durability

- A DBMS is a software that allows applications to store and analyze information in a database.

- The relational data model defines three concepts:

• Structure: The definition of relations and their contents.

This is the attributes the relations have and

the values that those attributes can hold.

• Integrity: Ensure the database’s contents satisfy constraints.

An example constraint would be that

any value for the year attribute has to be a number.

• Manipulation: How to access and modify a database’s contents.

- A data model is a collection of concepts for describing the data in a database.

The relational model is an

example of a data model.

- A schema is a description of a particular collection of data, using a given data model.

- A tuple is a set of attribute values (also known as its domain) in the relation.

- NULL, which means for a given tuple the attribute is undefined.

- A relation’s primary key uniquely identifies a single tuple.

- A foreign key specifies that an attribute from one relation has to map to a tuple in another relation.

- Relational Algebra is a set of fundamental operations to retrieve and manipulate tuples in a relation.

1- Select takes in a relation and outputs a subset of the tuples from that relation that satisfy a selection predicate.

2- Projection takes in a relation and outputs a relation with tuples that contain only specified attributes.

3- Union takes in two relations and outputs a relation that contains all tuples that appear in at least one of the

input relations.

4- Intersection takes in two relations and outputs a relation that contains all tuples that appear in both of the

input relations.

5- Difference takes in two relations and outputs a relation that contains all tuples that appear in the first relation

but not the second relation.

6- Product takes in two relations and outputs a relation that contains all possible combinations for tuples from

the input relations.

7- Join takes in two relations and outputs a relation that contains all the tuples that are a combination of two

tuples where for each attribute that the two relations share, the values for that attribute of both tuples is the

same.

- SQL

• DDL : Define Database structure.

• DML : Manipulate Database.

- Relationships :

• one to one

• one to many

• many to many