SQL
Data Definition Language and Update Operations

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Create Table - Syntax

- CREATE TABLE <table_name> (
  <attribute> <type>
  [not null][unique][primary key])
  {,<attribute> <type>
  [not null][unique][primary key] }
  [,<primary key constraint>]
  [{,<foreign key constraint> }]);

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Create Table - Syntax

- where
  - <attribute> is the name of attribute in the table to be defined
  - <type> can be
    - INTEGER
    - FLOAT/REAL
    - DECIMAL(I,J)
    - CHAR(N)
    - VARCHAR(N)

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Create Tables - Examples

- Create table person (

ssn	char(9) primary key,
fname	char(10) not null,
lname	char(10) not null,
phone#	char(10));

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Create Tables - Examples

- Create table student (

ssn	char(9),
classification	char(6),
gpa	decimal(4,3),
total_hours	integer,

  primary key (ssn),
  foreign key (ssn) references
  person(ssn));

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Alter Table - Syntax

- alter table <table_name> add (
  <attribute> <type>
  {, <attribute> <type>});

- alter table <table_name> modify (
  <attribute> <new_length>
  {, <attribute> <new_length>});

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Alter Table - Examples

- alter table person add (
  birth_date char(8));
- alter table section modify (
  title char (25),
  description char (50));

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Drop Tables - Syntax and Example

- drop table <table_name>
  [cascade constraints];
- drop table person
  cascade constraints;

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Insert - Syntax

- insert into <table_name>
  values (<value-list>);
- insert into <table_name>
  (<attribute-list>)
  values (<value-list>);
- insert into <table_name>
  select * from <another_table_name>;

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Insert - Examples

- insert into student
  values('293844323','senior',3.294,110);
- insert into person
  (ssn, fname, lname)
  values ('384729479','Susie','Jones');
- insert into section
  select * from temp_section;

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Delete - Syntax and Examples

- delete from <table_name>
  [where <condition>];
- delete from person
  where ssn = '394837497';
- delete from section;

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To Change Data Type of an Attribute

- If a table contains data, the data type of an attribute cannot be directly changed
- To do so
  - a temporary table is created and populated with the tuples of the original table
  - the tuples of the original table are deleted and the table is modified
  - the data is copied from the temporary table back into the modified original table

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To Change Data Type of an Attribute

- Example to change the data type of a character attribute to integer
  - create table temp_table as
    select * from section;
  - delete section;
  - alter table section (
    modify max_enroll integer);
  - insert into section
    select * from temp_table;
  - drop temp_table cascade constraints;

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Update tables

- Used to modify attribute values of one or more selected tuples.
- A WHERE-clause selects the tuples to be modified.
- An additional SET-clause specifies the attributes to be modified and their new values.
- Each command modifies tuples in the same relation.

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Update - Syntax and Examples

- update <table_name>
  set <attribute>=<value>
  {,<attribute>=<value>}
  [where <condition>];
- update student
  set classification = 'senior'
  where total_hours > 90;
- update section
  set max_enroll = 0;

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Views

- A view is a single virtual table that is derived from other tables
- The other tables could be base tables or previously defined views.
- A view does not exist in physical form, which limits the possible update operations that can be applied to views.
- There are no limitations on querying a view

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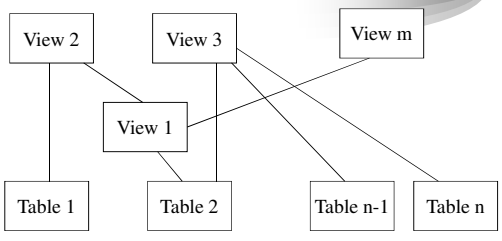
Views



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Create View - Syntax

- create view <view-name>
  [(<view-col-name> [, <view-col-name>]...)]
  as select <attr-name> [,<attr-name>] ...
  from <table-or-view-name>
  [,table-or-view-name] ...
  where <condition>;

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Create View - Examples

- create view dekalb_people
  (ssn, first_name, last_name)
  as select ssn, fname, lname
  from person
  where zip = '60115';

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Create View - Examples

- create view grade_count
  (grade, number_grade)
  as select grade, count(*)
  from transcript
  group by grade;

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Create View - Examples

- create view offered_sections
  as select *
  from section, course
  where section.course# =
  course.course#;

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Query on Views

- Views can be queried by using the same select operation as with tables just replace the table name with the view name
- There are some restrictions on insertion, deletion, and update function when used on views

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Drop Views - Syntax and Example

- drop view <view_name> ;
- drop view dekalb_people;

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Advantages of Views

- Views allow different users to see the data in different forms.
- Views can free users from complicated DML operations, especially in the case where the views involve joins.
- Views can enhance security

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System Catalog Views

- To find out what tables you have created, type
  - select table_name from user_tables;
- To find out information about a particular table (person, for example) type:
  - describe person;

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Some Built-in Functions

- lower(string)
  - converts string to lower case
- upper(string)
  - converts string to upper case
- Examples:

```
select *
    from c
    where lower(dept) = 'music';
```

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Some Built-in Functions

- lpad(x, y[,z])
  - returns the column padded on the left side of the data in the column passed as x to a width passed as y.
  - The optional passed value z indicates the character(s) that lpad() will insert into the column.
  - If no character is specified, a space will be used.
- rpad(x,y[,z]) similar to lpad.

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Some Built-in Functions

- Example
  - select ssn, course#, lpad(grade, 6), "GRADE" from transcript;

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Some Built-in Functions

- The default input format for date type is DD-MON-YY.
  - insert '22-Mar-99' into a date attribute

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Some Built-in Functions

- To insert a date value of different format into a dat field, you need to use to_date function
  - insert into emp(empno, hiredate)
    values(8989, to_date('99-12-31', 'yy-mm-dd'));
  - insert into emp(empno, hiredate)
    values(8988,
    to_date('99-12-31 14:35:00', 'yy-mm-dd hh24:mi:ss'));

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