Database creation

Modul 2

Agenda

- Create Data Base

- Tables

- Data types

- Modification of table structure

- Constraints

Database design

Database REQUIREMENTS

1. The company is divided into departments that have names and are located in different cities.

2. For each company employee there must be given first and last name, date of employment, position, monthly rate.

3. Each employee belongs to only one department.

4. Each employee has only one boss. The president of the company does not have a boss.

5. If the employee works as a salesman, he receives an additional compensation at the end of year.

6. Each employee belongs to a group depending on his salary.

7. For each group, the lower and upper limit of salary is determined.

Design DB

DEPARTMENT
- 🔑 ID
- NAME
- CITY

EMPLOYEE
- 🔑 ID
- LASTNAME
- FIRSTNAME
- POSITION
- DATE_EMPLOYMENT
- ID_DEPARTMENT
- ID_BOSS
- RATE
- BONUS

SALARY_GRADE
- ID
- LOW_SALARY
- HIGH_SALARY

Demonstration

Demo 1

Data types

Basic data types in MS SQL Server are:

- `INT` – integer numbers;
- `NUMERIC(m,n)` – fixed point real numbers;
- `FLOAT` – floating point real numbers;
- `CHAR(n)` – character string constant of length n characters;
- `VARCHAR(n)` – character string of variable length, maximum length n characters;
- `DATETIME`, `DATE`, `TIME` – date and time etc.

NULL – for all types

DDL and DML

- **DDL –** Data Definition Language
  - **CREATE**
  - **ALTER**
  - **DROP**

- **DML –** Data Manipulation Language
  - **INSERT**
  - **SELECT**
  - **UPDATE**
  - **DELETE**

Create table

Create a table using the query

CREATE TABLE <table name>

   (

   <field name 1> <type field 1>,

   <field name 2> <type field 2>, …

)

For example,

```
CREATE TABLE DEPARTMENT(ID INT NOT NULL,
        NAME VARCHAR(30),
        CITY VARCHAR(30))
```

Demonstration

Demo 2

Modify table structure

For modifying the existing structure of DB tables, we use are

ALTER TABLE and DROP TABLE commands

For modifying the structure of the table, we can do one from the following:

- ADD [COLUMN] – add a new field
- ALTER [COLUMN] – modify the field
- DROP [COLUMN] – delete the field
- ADD CONSTRAINT – add a new constraint
- DROP CONSTRAINT – delete the constraint

Demonstration

Demo 3

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Simple integrity constraint types

Integrity constraint can be divided into the following types:

- PRIMARY KEY

- UNIQUE

- NULL/NOT NULL

- FOREIGN KEY/REFERENCE

- CHECK

Demonstration

Demo 4

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Thank you!