

Databases



IT Learning &
Outsourcing Center

Basic Select Queries

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Agenda...

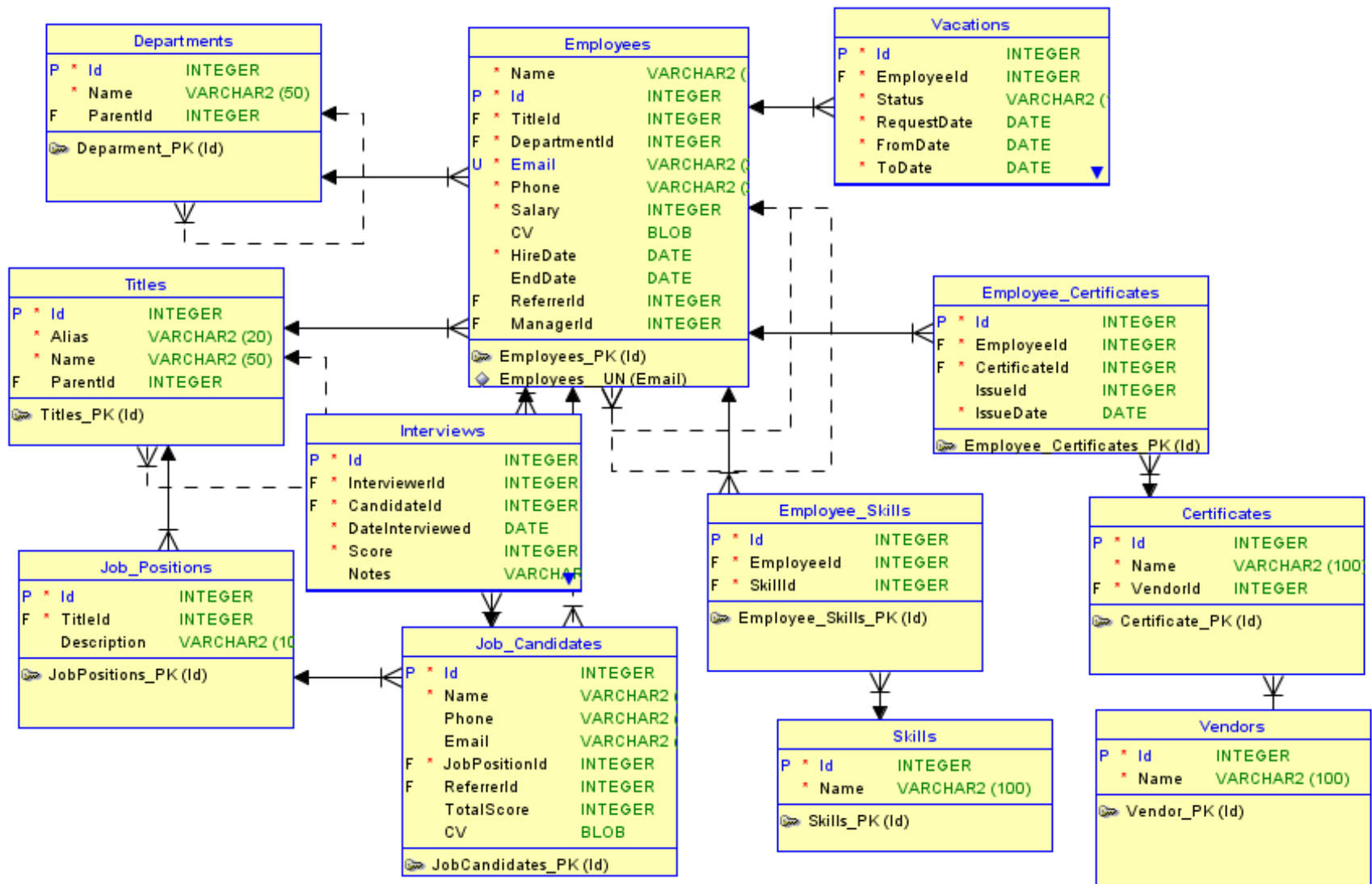
- Short Revision
- Review HRM Database Schema
- Basic Select Statement
- WHERE Clause
- Filtering With The Limit Clause



Short Revision

- Which are the main functions performed by a RDBMS ?
- Explain the difference between a primary and a foreign key.
- Point out the different types of relationships between tables.
- What are constraints used for in a database?
- What is SQL?
- Point out the different data types in MySQL.

HRM Database Schema







Select Statement

- The SELECT statement is used to select data from a database
- Example: Selecting all departments

```
SELECT * FROM Departments
```


 Id	Name	 ParentId
10	Marketing	2
9	Public Relations	2
8	Quality Assurance	1



Select Statement

■ Example: Selecting specific columns

```
SELECT id, name  
FROM Departments:
```

 id	name
1	Software Development
2	Business Development
3	Human Resources

■ Example: Eliminate duplicate rows

```
SELECT DISTINCT HireDate  
FROM Employees:
```

HireDate
2008-05-01
2009-11-25
2010-12-05
2012-10-07
2008-12-10



Select Statement

- Arithmetic operators can be used in queries:

$+, -, *, /$

- Example:

```
SELECT name, salary+300  
FROM EMPLOYEES ;
```

name	salary+300
Ronald Smith	10300
Mladen Petrov	10300
Ivan Ivanov	5300
Todor Dimitrov	5300
Stefan Petrov	6300
Jon Adams	5300
Maria Petrova	1300
Tom Blank	3300
Dimo Ivanov	2800



Select Statement

- Select without FROM causes
 - Example: `SELECT 2 + 3`
 - Example: `SELECT 'Hristo'`
 - Example: `SELECT "Hristo Topuzov"`
- A column aliases specifies an alternative name for a column the optional keyword AS is used
- An alias follows the column name
 - Example: `SELECT 2 + 3 as "2+3="`
 - Example: `SELECT name,hiredate,salary*1.2 as 'Annual Salary'
FROM employees`



Select Statement

- The concatenation function is used to concatenate columns or character strings to other columns
 - Example: `SELECT CONCAT('Hristo ', 'Topuzov') as 'Name'`
 - Example: `SELECT CONCAT (name, ' earn ', salary, ' per month')`
`FROM employees`



Select Statement

- CASE is used to provide if-then-else type of logic:
- Example:

```
SELECT name, salary,  
       CASE
```

```
    WHEN salary < 500 THEN '<500'
```

```
    WHEN salary < 1000 THEN '500-1000'
```

```
    WHEN salary < 2000 THEN '1000-2000'
```

```
    ELSE '>=2000'
```

```
END SalaryBucket
```

```
FROM Employees
```

name	salary	SalaryBucket
Ani Yordanova	1200	1000-2000
Asen Gradinarov	3000	>=2000
Bogomil Borisov	1500	1000-2000
Boris Penchev	1500	1000-2000
Cveti Vulchanova	600	500-1000
Daniel Ignatov	3200	>=2000



WHERE Clause

- The WHERE clause is used to extract only those records that fulfill a specified criterion
- The following is the list of operators available in a 'where' section:


=	Equal
≠	Not equal
>	Greater than
<	Less than
>=	Greater than or equal
<=	Less than or equal
BETWEEN	Between an inclusive range
LIKE	Search for a pattern
IN	Specify multiple possible values for a column



WHERE Clause

■ Examples:

- SELECT name, departmentid
FROM Employees
WHERE departmentid = 7

name	 departmentid
Tom Blank	7
Dimo Ivanov	7
Teodor Jivkov	7
Krasimir Dinev	7
Daniel Ignatov	7


- SELECT name, email, phone, cv
FROM Employees
WHERE email = 'jadams@company.com'

name	 email	phone	cv
Jon Adams	jadams@company.com	359889414145	(NULL)



WHERE Clause

- SELECT name, email, phone, cv
FROM Employees
WHERE salary < 1000

name	 email	phone	cv
Silvia Stefanova	stefanova@company.com	359871211111	(NULL)
Eva Mincheva	emincheva@company.com	359871211412	(NULL)
Cveti Vulchanova	cvulchanova@company.com	359871883311	(NULL)
Dora Tencheva	dtencheva@company.com	359871885566	(NULL)
Margarita Hristova	mhristova@company.com	359871881414	(NULL)
Tatiana Ivova	tivova@company.com	359878885566	(NULL)



WHERE Clause

- A null is a value that is unavailable, unassigned, unknown, or inapplicable
- Not the same as zero or a blank space
- Comparisons between two null values, or between a NULL and any other value, return false
- Examples:
 - `select * FROM employees WHERE HireDate <> null`
 - `select * FROM employees WHERE null = null`
 - `select 1*null`
 - `select * FROM employees WHERE HireDate is not null`
 - `select * FROM employees WHERE HireDate is null`



WHERE Clause

- The AND & OR operators are used to filter records based on more than one condition
- The AND operator displays a record if both the first condition AND the second condition are true
- The OR operator displays a record if either the first condition OR the second condition is true
- NOT operator can be used to negate a statement



WHERE Clause

- Examples:
 - SELECT name, email, phone, salary, hiredate
FROM employees
WHERE salary < 1000 and hiredate < "2010-01-01"

name	 email	phone	salary	hiredate
Cveti Vulchanova	cvulchanova@company.com	359871883311	600	2008-05-01
Dora Tencheva	dtencheva@company.com	359871885566	600	2009-11-25
Margarita Hristova	mhristova@company.com	359871881414	900	2008-04-20



WHERE Clause



- Examples:
 - SELECT name, email, phone, salary , hiredate
FROM employees
WHERE salary = 5000 or salary = 6000

name	 email	phone	salary	hiredate
Ivan Ivanov	iivanov@company.com	359887121314	5000	2008-10-01
Todor Dimitrov	tdimitrov@company.com	359887141516	5000	2009-05-12
Stefan Petrov	spetrov@company.com	359888777777	6000	2011-08-19
Jon Adams	jadams@company.com	359889414145	5000	2010-08-11



WHERE Clause



- Examples:
 - SELECT name, email, phone, salary , departmentID
FROM employees
WHERE departmentID = 6
and (salary = 5000 or salary = 6000)

name	 email	phone	salary	 departmentID
Ivan Ivanov	iivanov@company.com	359887121314	5000	6
Todor Dimitrov	tdimitrov@company.com	359887141516	5000	6
Stefan Petrov	spetrov@company.com	359888777777	6000	6
Jon Adams	jadams@company.com	359889414145	5000	6



WHERE Clause

- Examples:
 - SELECT name, email, phone, salary , departmentID
FROM employees
WHERE NOT departmentID = 6
and (salary = 1000 or salary = 2000)

name	 email	phone	salary	 departmentID
Maria Petrova	mpetrova@company.com	359879873236	1000	5
Teodor Jivkov	tjivkov@company.com	359879125563	2000	7
Iliana Dimitrova	idimitrova@company.com	359879873111	2000	8
Veneta Petkova	vpetkova@company.com	359879873222	2000	8
Vili Nikolova	vnikolova@company.com	359879873333	2000	8
Didi Marinova	dmarinova@company.com	359879353411	1000	10
Martin Petkov	mmetkov@company.com	359871212411	1000	10



WHERE Clause


- The IN/NOT IN operator is used to specify a set of values for search:
- Examples:
 - SELECT name, email, phone, salary , hiredate
FROM employees
WHERE salary in (6000, 5000)

name	 email	phone	salary	hiredate
Ivan Ivanov	iivanov@company.com	359887121314	5000	2008-10-01
Todor Dimitrov	tdimitrov@company.com	359887141516	5000	2009-05-12
Stefan Petrov	spetrov@company.com	359888777777	6000	2011-08-19
Jon Adams	jadams@company.com	359889414145	5000	2010-08-11



WHERE Clause


- The BETWEEN operator is used to specify a search range
- Examples:
 - SELECT name, email, phone, salary , hiredate
FROM employees
WHERE hiredate between "2008-03-01" and "2009-05-12"

name	 email	phone	salary	hiredate
Ronald Smith	rsmith@company.com	359888111111	10000	2008-03-01
Mladen Petrov	mpetrov@company.com	359888222222	10000	2008-03-01
Ivan Ivanov	iivanov@company.com	359887121314	5000	2008-10-01
Todor Dimitrov	tdimitrov@company.com	359887141516	5000	2009-05-12
Tom Blank	tblank@company.com	359879556677	3000	2008-04-20
Dimo Ivanov	diliev@company.com	359879776544	2500	2008-05-10
Boris Penchev	bpenchev@company.com	359879173211	1500	2009-05-04



WHERE Clause


- The LIKE operator to specify a search pattern:
 - % means 0 or more chars
 - _ means one char
- Examples:
 - SELECT name, email, phone, salary , hiredate
FROM employees
WHERE name like "Ivan Ivanov"

name	 email	phone	salary	hiredate
Ivan Ivanov	iivanov@company.com	359887121314	5000	2008-10-01



WHERE Clause

- Examples:
 - SELECT name, email, phone, salary , hiredate
FROM employees
WHERE name like "% Ivanov"

name	 email	phone	salary	hiredate
Ivan Ivanov	iivanov@company.com	359887121314	5000	2008-10-01
Dimo Ivanov	diliev@company.com	359879776544	2500	2008-05-10



WHERE Clause

- Examples:
 - SELECT name, email, phone, salary , hiredate
FROM employees
WHERE phone like "%877__5511"

name	 email	phone	salary	hiredate
Petio Ilchev	pilchev@company.com	359877445511	900	2012-04-13
Katio Jeleva	kjeleva@company.com	359877555511	1100	2012-12-20
Lilia Beneva	lbeneva@company.com	8877655511	2300	2008-05-01



Order by Clause

- The ORDER BY keyword sorts the records in ascending order by default. To sort the records in a descending order, you can use the DESC keyword.
 - ASC: ascending order, default
 - DESC: descending order



Order by Clause


- Examples:
 - SELECT name, email, phone, salary , hiredate
FROM employees
WHERE salary <= 800
ORDER BY salary, hiredate

name	 email	phone	salary	hiredate
Cveti Vulchanova	cvulchanova@company.com	359871883311	600	2008-05-01
Dora Tencheva	dtencheva@company.com	359871885566	600	2009-11-25
Tatiana Ivoval	tivova@company.com	359878885566	700	2010-12-05
Kristina Dobрева	kdobreva@company.com	359871885555	700	2012-10-07
Silvia Stefanova	stefanova@company.com	359871211111	800	2010-09-12
Nikolay Denislavov	ndenislavov@company.com	359870175555	800	2013-05-01
Radina Cvetanova	rcvetanova@company.com	359877179191	800	2013-10-01



Order by Clause

- Examples:
 - SELECT name, email, phone, salary , hiredate
FROM employees
WHERE salary <= 800
ORDER BY salary, hiredate DESC

name	 email	phone	salary	hiredate
Dora Tencheva	dtancheva@company.com	359871885566	600	2009-11-25
Cveti Vulchanova	cvulchanova@company.com	359871883311	600	2008-05-01
Kristina Dobрева	kdobрева@company.com	359871885555	700	2012-10-07
Tatiana Ivova	tivova@company.com	359878885566	700	2010-12-05
Radina Cvetanova	rcvetanova@company.com	359877179191	800	2013-10-01
Nikolay Denislavov	ndenislavov@company.com	359870175555	800	2013-05-01
Silvia Stefanova	stefanova@company.com	359871211111	800	2010-09-12

Filtering with the limit




- The LIMIT clause is used to specify the number of records to return. This clause can be very useful on large tables with thousands of records. Returning a large number of records can impact on performance



Filtering with the limit

- Example:
 - SELECT name, email, phone, salary , hiredate
FROM employees
ORDER BY salary desc
LIMIT 5

name	 email	phone	salary	hiredate
Ronald Smith	rsmith@company.com	359888111111	10000	2008-03-01
Mladen Petrov	mpetrov@company.com	359888222222	10000	2008-03-01
Stefan Petrov	spetrov@company.com	359888777777	6000	2011-08-19
Ivan Ivanov	iivanov@company.com	359887121314	5000	2008-10-01
Todor Dimitrov	tdimitrov@company.com	359887141516	5000	2009-05-12

Questions

