Dynamic Web Development

Lecture 13 – PHP and MySQLi 2

Relational Databases

Part 2

Relationships

What relationships between Dept and Emp exist?

Which ones do I need to store in the database?

How might I store that relationship in the database?

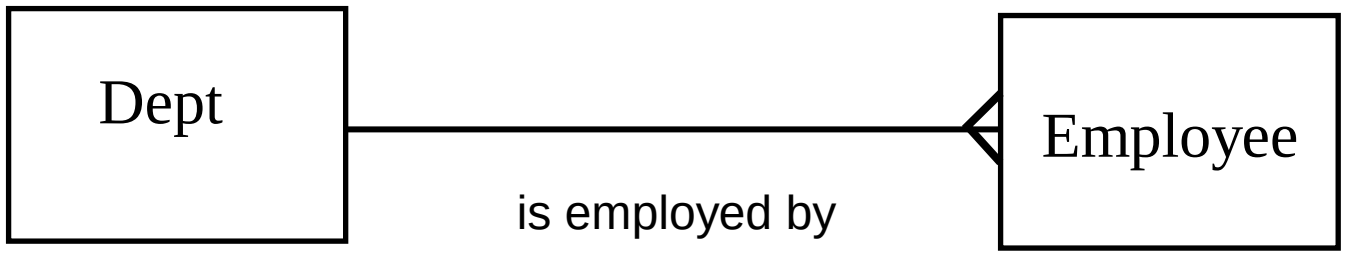
DEPT

deptno	dname	budget
D1	Marketing	10000.00
D2	Development	12000.00
D3	Research	5000.00

EMPLOYEE

empno	ename	salary
E1	Smith	10000
E2	Jones	14000
E3	Brown	8000
E4	White	9000

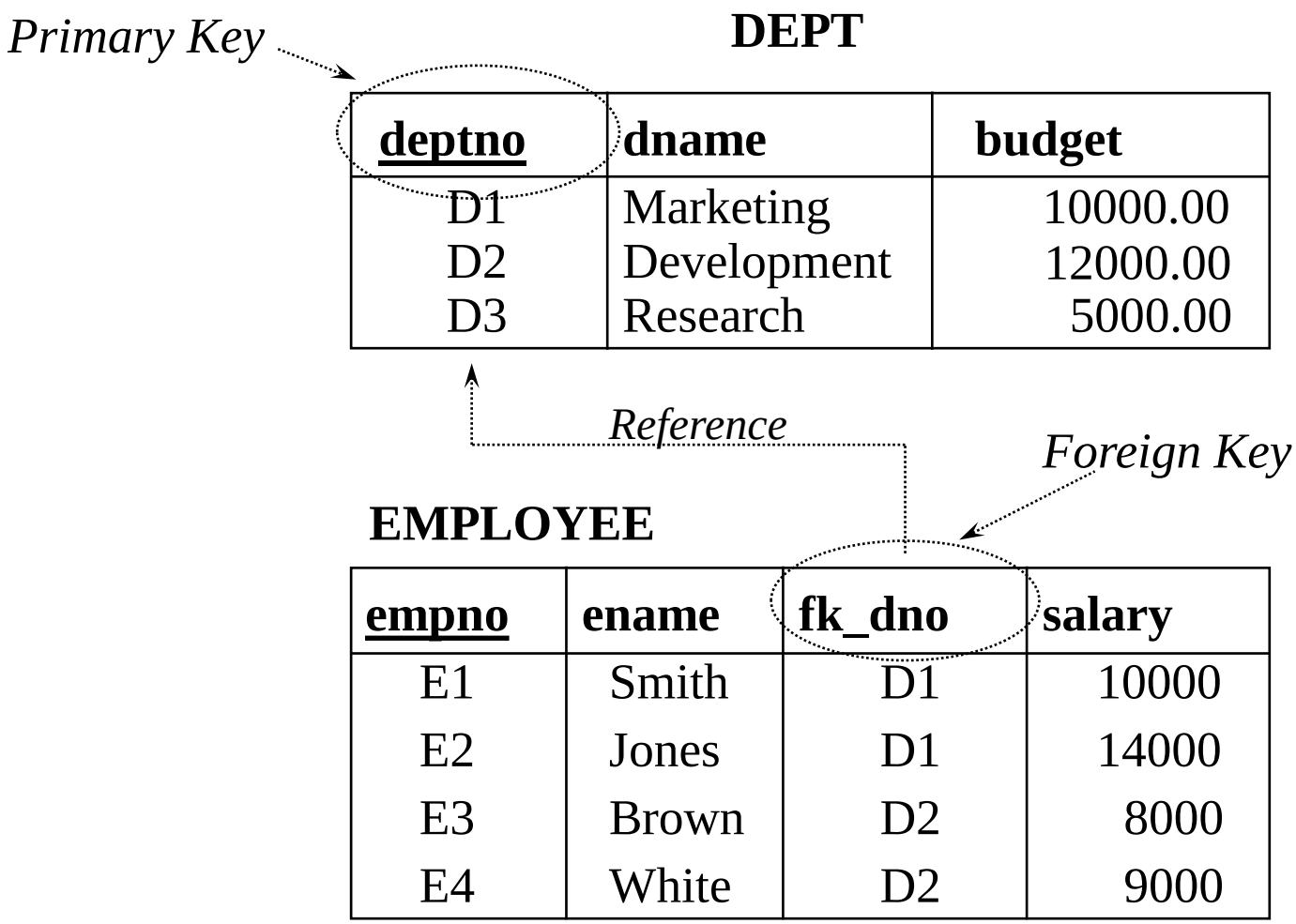
Showing Relationships



One Department can employ many Employees.
One Employee is only employed by one Department.

The relationship is implemented by:
placing a Foreign Key in the table at the 'many' end of the relationship.

Foreign Keys



Why not the other way round?

Foreign Key

DEPT

deptno	dname	budget	fk_empno
D1	Marketing	10000.00	E1, E4
D2	Development	12000.00	E2, E3
D3	Research	5000.00	E5, E6, E7

Multiple values in one column shows the database has not been designed properly.

EMPLOYEE

empno	ename	salary
E1	Smith	10000
E2	Jones	14000
E3	Brown	8000
E4	White	9000

To set up this small database

```
CREATE TABLE dept
(
deptno   VARCHAR(2),
dname   VARCHAR(30),
budget   NUMBER(7,2),
PRIMARY KEY (deptno)
);

INSERT INTO dept  VALUES ('D1', 'Marketing', 10000.00);
INSERT INTO dept  VALUES ('D2', 'Development', 12000.00);
INSERT INTO dept  VALUES ('D3', 'Research', 5000.00);
```

To set up this small database

```
CREATE TABLE employee
(
empno   VARCHAR(2),
ename   VARCHAR(30),
fk_dno   VARCHAR(2),
salary     NUMBER(5),
PRIMARY KEY (empno),
FOREIGN KEY (fk_dno) REFERENCES dept(deptno)
);

INSERT INTO employee  VALUES ('E1','Smith', 'D1', 10000);
INSERT INTO employee  VALUES ('E2','Jones', 'D1', 14000);
INSERT INTO employee  VALUES ('E3', 'Brown', 'D2', 8000);
INSERT INTO employee  VALUES ('E4', 'White', 'D2', 9000);
```

To get data out of the database

```
SELECT *
FROM employee;
```

will output the following:

```
empno   ename   fk_dno   salary
-----------------------------
E1      Smith   D1        10000
E2      Jones   D1        14000
E3      Brown   D2         8000
E4      White   D2         9000
```

To get data out of the database

```
SELECT ename, dname
FROM employee, dept
WHERE deptno = fk_dno;
```

will output the following:

```
ename    dname
--------------------
Smith    Marketing
Jones    Marketing
Brown    Development
White    Development
```

Getting Data Out of a MySQL Database

At the top of each page which will access the database:

```
<?php
$host = "localhost";
$user = "root";
$password = "abcdefg";
$database = "assign01";

//connect to MySQL

$connect = new mysqli($host, $user, $password, $database );

if ($connect->connect_errno)
{
    echo "Failed to connect to MySQL: " .
                                    $connect->connect_error;
}
```

Executing the Query

```
$query = "SELECT cdnum, cdname, artist
                  FROM cdtable";
```

You set up the SQL query as a string.

Assign it to a variable.

Supply that variable to the mysql query function.

```
$results = $connect->query($query);
```

Which will execute the query and return the results into the specified variable.

$results will contain a set of rows from the database. It is effectively an array of rows, and each row is an array of fields.

Counting the number of rows

```
$numrow = $results->num_rows;
```

If **`$results`** contains 4 records,

the function will
put the value 4
into the variable:
`$numrow`.

Getting at the Results

```
$row = $results->fetch_assoc();
```

This will get the **first** set of results and place them in an array called **`$row`**.

Note how the field names from the database are used as subscript names for the array.

`$row`

cdnum	008
cdname	Paranoid
artist	Black Sabbath

To output one record to the browser

```
$row = $results->fetch_assoc();

echo $row['cdnum'];

echo $row['cdname'];

echo $row['artist'];
```

Using extract( );

You can refer to the data by using the array name like:

```
$row['cdnum']
```

but it is easier to use the extract function,

```
extract( $row );
```

which will pull the values out of the array, and place them into variables that are named after the field names in the database:

so you can use `$cdnum` and `$cdname`

If there is more than row of results

```
$count = 1;
while ($count <= $numrow)
      {
        $row = $results->fetch_assoc();
        extract($row);
        echo $cdnum;
        echo " - ";
        echo $cdname;
        echo " - ";
        echo $artist;
        echo "<br />";
         $count = $count + 1;
      }
```

Use a while loop

this would produce the following output

```
0001 - The Wall - Pink Floyd
0002 - Tago Mago - Can
0003 - Till Deaf Us Do Part - Slade
0004 - In Absentia - Porcupine Tree
0005 - Space Ritual - Hawkwind
```

```
echo "<table>";

$count = 1;
while ($count <= $numrow)
{
  $row = $results->fetch_assoc();
  extract($row);

  echo "<tr>";

  echo "<td>";
  echo $cdnum;
  echo "</td>";

  echo "<td>";
  echo $cdname;
  echo "</td>";

  echo "<td>";
  echo $artist;
  echo "</td>";

  echo "</tr>";
  $count = $count + 1;
}
echo "</table><br />";
echo "The number of records found was:";
echo $count;
```

Putting the output into a table

will send the following html to the browser

```
<html>
<head></head>
<body>
<table border="1">

<tr><td>0001</td><td>The Wall</td><td>Pink Floyd</td></tr>
<tr><td>0002</td><td>Tago Mago</td><td>Can</td></tr>
<tr><td>0003</td><td>Till Deaf Us Do Part</td><td>Slade</td></tr>
<tr><td>0004</td><td>In Absentia</td><td>Porcupine Tree</td></tr>
<tr><td>0005</td><td>Space Ritual</td><td>Hawkwind</td></tr>

</table>
<br />
The number of records found was: 5
</body>
</html>
```

which will produce a web page like this

0001	The Wall	Pink Floyd
0002	Tago Mago	Can
0003	Till Deaf Us Do Part	Slade
0004	In Absentia	Porcupine Tree
0005	Space Ritual	Hawkwind

The number of records found was: 5

Any Questions?