SQL/XML

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Как выгружать формат XML из обыкновенных таблиц?

Воспользоваться расширением SQL/XML!

SQL/XML(ISO/IEC 9075–14:2005(E))

- Функции:
  - XMLELEMENT
  - XMLATTRIBUTES
  - XMLFOREST
  - XMLCONCAT
  - XMLAGG
  - XMLCOMMENT
  - XMLROOT
  - и т.д.

Пример (XMLElement)

```
-- With standard XML date format:
SELECT XMLElement("Date", hire_date)
  FROM hr.employees
  WHERE employee_id = 203;

XMLELEMENT("DATE",HIRE_DATE)
----------------------------
<Date>1994-06-07</Date>

1 row selected.
```

Пример (XMLElement)

```
-- With an alternative date format:
SELECT XMLElement("Date", to_char(hire_date))
  FROM hr.employees
  WHERE employee_id = 203;

XMLELEMENT("DATE",TO_CHAR(HIRE_DATE))
--------------------------------------
<Date>07-JUN-94</Date>
```

Пример (XMLElement)

```
SELECT e.employee_id,
       XMLELEMENT ("Emp", e.first_name ||' '|| e.last_name) AS "RESULT"
   FROM hr.employees e
   WHERE employee_id > 200;
```

```
EMPLOYEE_ID RESULT
----------- ------------------------------------
        201 <Emp>Michael Hartstein</Emp>
        202 <Emp>Pat Fay</Emp>
        203 <Emp>Susan Mavris</Emp>
        204 <Emp>Hermann Baer</Emp>
        205 <Emp>Shelley Higgins</Emp>
        206 <Emp>William Gietz</Emp>

6 rows selected.
```

Пример (XMLElement)

```
SELECT XMLElement("Emp",
                  XMLElement("name", e.first_name ||' '|| e.last_name),
                  XMLElement("hiredate", e.hire_date)) AS "RESULT"
FROM hr.employees e
WHERE employee_id > 200 ;
```

```
RESULT
--------------------------------------------------------------------
<Emp><name>Michael Hartstein</name><hiredate>1996-02-17</hiredate></Emp>
<Emp><name>Pat Fay</name><hiredate>1997-08-17</hiredate></Emp>
<Emp><name>Susan Mavris</name><hiredate>1994-06-07</hiredate></Emp>
<Emp><name>Hermann Baer</name><hiredate>1994-06-07</hiredate></Emp>
<Emp><name>Shelley Higgins</name><hiredate>1994-06-07</hiredate></Emp>
<Emp><name>William Gietz</name><hiredate>1994-06-07</hiredate></Emp>

6 rows selected.
```

Пример (XMLElement, XMLAttributes)

```
SELECT XMLElement("Emp", XMLAttributes(
                            e.employee_id as "ID",
                            e.first_name ||' ' || e.last_name AS "name"))
  AS "RESULT"
  FROM hr.employees e
  WHERE employee_id > 200;
```

```
RESULT
--------------------------------------------
<Emp ID="201" name="Michael Hartstein"></Emp>
<Emp ID="202" name="Pat Fay"></Emp>
<Emp ID="203" name="Susan Mavris"></Emp>
<Emp ID="204" name="Hermann Baer"></Emp>
<Emp ID="205" name="Shelley Higgins"></Emp>
<Emp ID="206" name="William Gietz"></Emp>

6 rows selected.
```

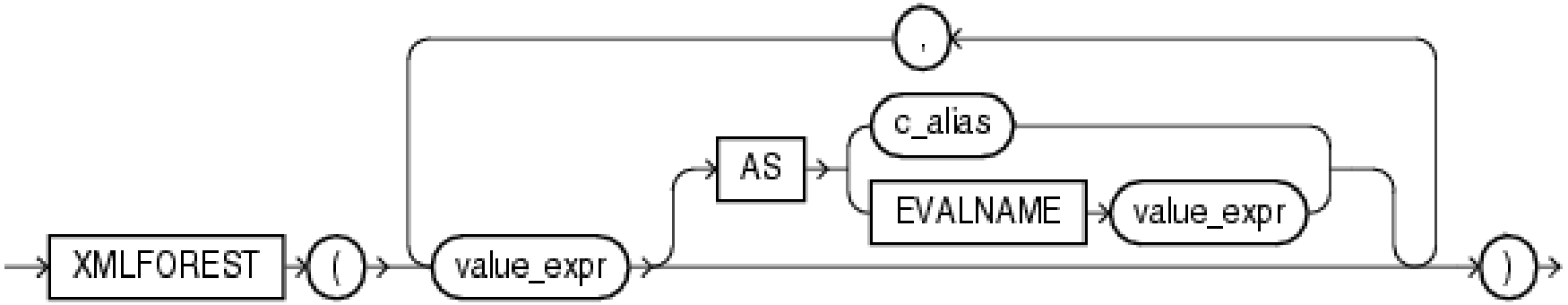
Пример (XMLElement, XMLAttributes)

```
SELECT XMLElement("Emp->Special",
                  XMLAttributes(e.last_name || ', ' || e.first_name
                                AS "Last,First"))
   AS "RESULT"
   FROM hr.employees e
   WHERE employee_id = 201;
```

```
RESULT
--------------------------------------------------------------------
<Emp->Special Last,First="Hartstein, Michael"></Emp->Special>

1 row selected.
```

Синтаксис XMLFOREST



Пример(XMLForest)

```
SELECT XMLElement("Emp",
                  XMLAttributes(e.first_name ||' '|| e.last_name AS "name"),
                  XMLForest(e.hire_date, e.department AS "department"))
AS "RESULT"
FROM employees e WHERE e.department_id = 20;
```

```
RESULT
--------------------------------------
<Emp name="Michael Hartstein">
  <HIRE_DATE>1996-02-17</HIRE_DATE>
  <department>20</department>
</Emp>
<Emp name="Pat Fay">
  <HIRE_DATE>1997-08-17</HIRE_DATE>
  <department>20</department>
</Emp>

2 rows selected.
```

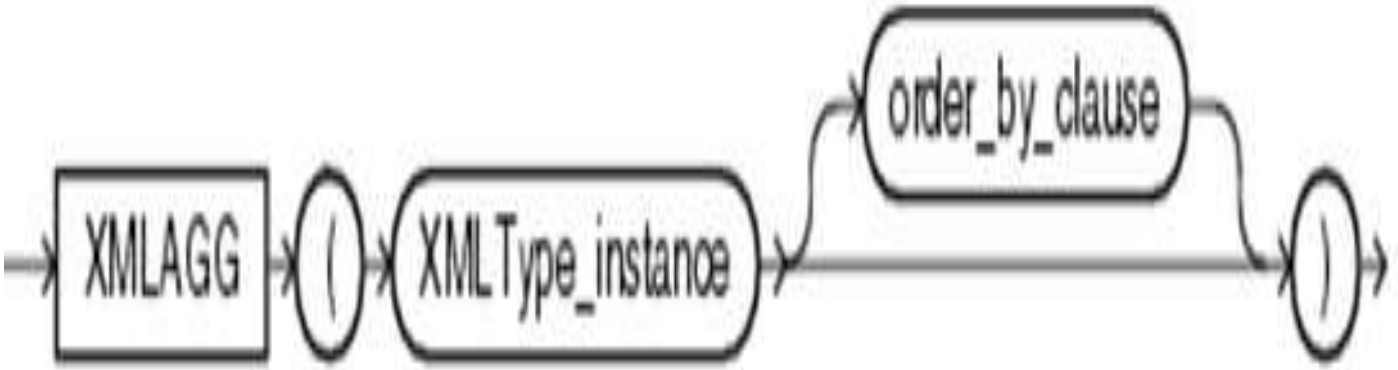
Пример (XMLCONCAT)

```
SELECT XMLConcat(XMLElement("first", e.first_name),
                 XMLElement("last", e.last_name))
  AS "RESULT"
  FROM employees e;
```

```
RESULT
----------------------------------------
<first>Den</first><last>Raphaely</last>
<first>Alexander</first><last>Khoo</last>
<first>Shelli</first><last>Baida</last>
<first>Sigal</first><last>Tobias</last>
<first>Guy</first><last>Himuro</last>
<first>Karen</first><last>Colmenares</last>

6 rows selected.
```

Синтаксис XMLAGG



Пример (XMLAGG)

```
SELECT XMLElement("Department", XMLAgg(XMLElement("Employee",
                                                  e.job_id||' '||e.last_name)
                                       ORDER BY e.last_name))
  AS "Dept_list"
  FROM hr.employees e
  WHERE e.department_id = 30 OR e.department_id = 40;

Dept_list
------------------
<Department>
  <Employee>PU_CLERK Baida</Employee>
  <Employee>PU_CLERK Colmenares</Employee>
  <Employee>PU_CLERK Himuro</Employee>
  <Employee>PU_CLERK Khoo</Employee>
  <Employee>HR_REP Mavris</Employee>
  <Employee>PU_MAN Raphaely</Employee>
  <Employee>PU_CLERK Tobias</Employee>
</Department>

1 row selected.
```

Пример (XMLAGG)

```
SELECT XMLElement("Department", XMLAttributes(department_id AS "deptno"),
                  XMLAgg(XMLElement("Employee", e.job_id||' '||e.last_name)))
   AS "Dept_list"
   FROM hr.employees e
   GROUP BY e.department_id;

Dept_list
------------------
<Department deptno="30">
  <Employee>PU_MAN Raphaely</Employee>
  <Employee>PU_CLERK Khoo</Employee>
  <Employee>PU_CLERK Baida</Employee>
  <Employee>PU_CLERK Himuro</Employee>
  <Employee>PU_CLERK Colmenares</Employee>
  <Employee>PU_CLERK Tobias</Employee>
</Department>

<Department deptno="40">
  <Employee>HR_REP Mavris</Employee>
</Department>

2 rows selected.
```

Пример (XMLAGG)

```
SELECT
  XMLElement(
    "Department",
    XMLAttributes(d.department_name AS "name"),
    (SELECT
       XMLAgg(XMLElement("emp",
                         XMLAttributes(e.last_name AS name),
                         (SELECT XMLAgg(XMLElement("dependent",
                                                   XMLAttributes(de.name AS "name")))
                            FROM dependents de
                            WHERE de.employee_id = e.employee_id)))
       FROM employees e
       WHERE e.department_id = d.department_id)) AS "dept_list"
  FROM departments d
  WHERE department_id = 30;

dept_list
--------------------------------------------------------------------------------
<Department name="Purchasing">
  <emp NAME="Raphaely">
    <dependent name="MARK"></dependent>
    <dependent name="JACK"></dependent>
  </emp><emp NAME="Khoo">
    <dependent name="JANE"></dependent>
```

Задание 13.2

1. Загрузите в свою схему xml-документ с названиями кафедр, заведующими, студентами, предметами, отметками. Создайте приложение с отчетами, в которых будут выведены:
a)фамилии студентов и все отметки (список должен быть упорядочен по фамилиям студентов);
b)фамилии студентов и средние баллы (список должен быть упорядочен по среднему баллу);
c)все названия предметов, которые читаются на различных IT кафедрах (список должен быть упорядочен по кафедрам, а затем по названиям предметов);
d)названия предметов, которые читаются на каждой IT кафедре (т.е. пересечение).

2.Выдайте содержимое своей базы (которая использовалась в приложении) в виде xml-документа.