

SDXML

Assignment 3

GROUP 9

SQL/XML

Group members.

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Summary:

Use DB : Coursedb

Software : IBM db2

Question 01

Retrieve the rooms that have been visited by students from Kista!

SOLUTION IN IBM DB2

```
select      xmlelement(NAME "Result",
                      xmlagg(
                        xmlcol
                      )
            )
from  (select      xmlelement(NAME "Student",
                      xmlattributes(Student as "Name"),
                      xmlagg(
                        xmlelement(NAME "Room",Room)
                      )
                    ) as xmlcol
        from  (select      distinct co.room as Room, s.sname as Student
                        from  courseoffering co inner join participation p on
co.startdate = p.startdate and co.course=p.course
                        inner join student s on s.sid = p.student
                        where xmlexists('$c//address[@city="Kista"]' passing
s.contact as "c")
        )
        group by Student
    );
```

```

select  xmlelement(NAME "Result",
                xmlagg(
                    xmlcol
                )
            )
from    (select      xmlelement(NAME "Student",
                                xmlattributes(Student as "Name"),
                                xmlagg(
                                    xmlelement(NAME "Room",Room)
                                )
                            ) as xmlcol
        from    (select      distinct co.room as Room, s.sname as Student
        from      courseoffering co inner join participation p on co.startdate = p.startdate and co.course=p.course
                  inner join student s on s.sid = p.student
        where     xmlexists('$c//address[@city="Kista"]' passing s.contact as "c")
        )
        group by Student
    );

```

RESULT

```

<Result>
  <Student Name="Ann Stål">
    <Room>Jupiter</Room>
    <Room>Orion</Room>
    <Room>Sirius</Room>
  </Student>
  <Student Name="Robert Ahl">
    <Room>Jupiter</Room>
  </Student>
  <Student Name="Sigge Ehn">
    <Room>Orion</Room>
    <Room>Sirius</Room>
  </Student>
  <Student Name="Siw Björk">
    <Room>Jupiter</Room>
    <Room>Orion</Room>
  </Student>
</Result>

```

Question 02

How many students have participated in each course offering?

SOLUTION IN IBM DB2

```
select      xmlelement(NAME "Result",
                        xmlagg(
                          xmlcol
                        )
          )
from    (select      xmlelement(NAME "CourseOffering",
                                xmlattributes( course as "CourseCode", coursename as
"CourseName",startdate as "StartDate",room as "Room"),
                                xmlforest(tname as "Teacher",
                                           (select count(*) from participation
where startdate = co.startdate and course = co.course) as "NumberOfStudents"
                                           )
                                ) xmlcol
        from    courseoffering co inner join course c on co.course=c.coursecode
              inner join teacher t on t.tid=co.teacher
        );
```

```
select xmlelement(NAME "Result",
                  xmlagg(
                    xmlcol
                  )
        )
from    (select xmlelement(NAME "CourseOffering",
                            xmlattributes( course as "CourseCode", coursename as "CourseName",startdate as "StartDate",room as "Room"),
                            xmlforest(tname as "Teacher",
                                       (select count(*) from participation where startdate = co.startdate and course = co.course) as "NumberOfStudents"
                                       )
                            ) xmlcol
        from    courseoffering co inner join course c on co.course=c.coursecode
              inner join teacher t on t.tid=co.teacher
        );|
```

RESULT

<Result>

```
<CourseOffering CourseCode="Java1"
  CourseName="Java, basic course" StartDate="2008-03-06" Room="Tellus">
  <Teacher>Bo Åkerman</Teacher>
  <NumberOfStudents>5</NumberOfStudents>
</CourseOffering>
<CourseOffering CourseCode="DBM1"
  CourseName="Database Methodology" StartDate="2008-04-02" Room="Sirius">
  <Teacher>Sofia Wilsson</Teacher>
  <NumberOfStudents>4</NumberOfStudents>
</CourseOffering>
<CourseOffering CourseCode="Java2"
  CourseName="Java, advanced course" StartDate="2008-04-16" Room="Orion">
  <Teacher>Bo Åkerman</Teacher>
  <NumberOfStudents>3</NumberOfStudents>
</CourseOffering>
<CourseOffering CourseCode="Log1" CourseName="Logic"
  StartDate="2008-04-16" Room="Jupiter">
  <Teacher>Carl Nordin</Teacher>
  <NumberOfStudents>2</NumberOfStudents>
</CourseOffering>
<CourseOffering CourseCode="Java1"
  CourseName="Java, basic course" StartDate="2008-05-06" Room="Jupiter">
  <Teacher>Bo Åkerman</Teacher>
  <NumberOfStudents>2</NumberOfStudents>
</CourseOffering>
<CourseOffering CourseCode="LDBD"
  CourseName="Logical Database Design" StartDate="2008-05-06"
  Room="Sirius">
  <Teacher>Sofia Wilsson</Teacher>
  <NumberOfStudents>2</NumberOfStudents>
</CourseOffering>
<CourseOffering CourseCode="PDBD"
  CourseName="Physical Database Design" StartDate="2008-05-09"
  Room="Jupiter">
  <Teacher>Lena Svensson</Teacher>
  <NumberOfStudents>2</NumberOfStudents>
</CourseOffering>
<CourseOffering CourseCode="Java1"
```

Question 03

Show the course offerings grouped by course!

SOLUTION IN IBM DB2

```
select      xmlelement(NAME "Result",
                      xmlagg(
                        xmlcol
                      )
)
from  (select      xmlelement(NAME "Course",
                      xmlattributes(coursecode as "Code",coursename as "Name"),
                      xmlagg(
                        xmlelement(NAME "CourseOffering",
                                  xmlattributes(
                                    startdate as "StartDate",
                                    room as "Room",
                                    (select tname from teacher where
tid=co.teacher) as "Teacher",
                                  (select count(*) from participation where
startdate =co.startdate and course = co.course) as "NumberOfStudents"
                                )
                      )
                    ) as xmlcol
      from  courseoffering co inner join course c on co.course=c.coursecode
      group by      coursecode, coursename
    );
```

```
select  xmlelement(NAME "Result",
                  xmlagg(
                    xmlcol
                  )
)
from  (select  xmlelement(NAME "Course",
                  xmlattributes(coursecode as "Code",coursename as "Name"),
                  xmlagg(
                    xmlelement(NAME "CourseOffering",
                                xmlattributes(
                                  startdate as "StartDate",
                                  room as "Room",
                                  (select tname from teacher where tid=co.teacher) as "Teacher",
                                  (select count(*) from participation where startdate =co.startdate and course = co.course) as "NumberOfStudents"
                                )
                  )
                ) as xmlcol
      from  courseoffering co inner join course c on co.course=c.coursecode
      group by      coursecode, coursename
    );
```

RESULT

```
<Result>
  <Course Code="DBM1" Name="Database Methodology">
    <CourseOffering StartDate="2008-04-02" Room="Sirius"
      Teacher="Sofia Wilsson" NumberOfStudents="4" />
    <CourseOffering StartDate="2009-01-28" Room="Jupiter"
      Teacher="Sofia Wilsson" NumberOfStudents="2" />
  </Course>
  <Course Code="Java1" Name="Java, basic course">
    <CourseOffering StartDate="2008-03-06" Room="Tellus"
      Teacher="Bo Åkerman" NumberOfStudents="5" />
    <CourseOffering StartDate="2008-05-06" Room="Jupiter"
      Teacher="Bo Åkerman" NumberOfStudents="2" />
    <CourseOffering StartDate="2008-09-02" Room="Tellus"
      Teacher="Carl Nordin" NumberOfStudents="2" />
  </Course>
  <Course Code="Java2" Name="Java, advanced course">
    <CourseOffering StartDate="2008-04-16" Room="Orion"
      Teacher="Bo Åkerman" NumberOfStudents="3" />
    <CourseOffering StartDate="2009-01-22" Room="Orion"
      Teacher="Bo Åkerman" NumberOfStudents="3" />
  </Course>
  <Course Code="LDBD" Name="Logical Database Design">
    <CourseOffering StartDate="2008-05-06" Room="Sirius"
      Teacher="Sofia Wilsson" NumberOfStudents="2" />
    <CourseOffering StartDate="2008-09-02" Room="Orion"
      Teacher="Lena Svensson" NumberOfStudents="2" />
  </Course>
  <Course Code="Log1" Name="Logic">
    <CourseOffering StartDate="2008-04-16" Room="Jupiter"
      Teacher="Carl Nordin" NumberOfStudents="2" />
  </Course>
  <Course Code="PDBD" Name="Physical Database Design">
    <CourseOffering StartDate="2008-05-09" Room="Jupiter"
      Teacher="Lena Svensson" NumberOfStudents="2" />
  </Course>
</Result>
```

Question 04

Show the following information about each course: Code, Name, Length, Price, Number of course offerings. The result shall have five columns and one row per course.

SOLUTION IN IBM DB2

```
select coursecode as "Code",
       coursename as "Name",
       xmlquery('$INFO//length/text()')as "Length",
       xmlquery('$INFO//price/text()') as "Price",
       (select count(*) from courseoffering where course=coursecode) as "Number
of course offerings"
from   course;
```

RESULT

	Code	Name	Length	Price	Number of course offerings
1	DBM1	Database Methodology	2	2800	2
2	PDBD	Physical Database Design	5	7200	1
3	Java1	Java, basic course	5	6700	3
4	Java2	Java, advanced course	4	6000	2
5	LDBD	Logical Database Design	4	6000	2
6	Log1	Logic	3	4500	1

Question 05

Show the following information about each student: ID, Name, City, Mobile number, Number of taken courses. The result shall have five columns and one row per student

SOLUTION IN IBM DB2

```
select      sid as "ID",
            sname as "Name",
            xmlquery('data($CONTACT//address/@city)') as "City",
            xmlquery('$CONTACT//phone[@type="mobile"]/text()') as "Mobile Number",
            (select count(*) from participation where student= sid) as "Number of
taken courses"
from      student
```

RESULT

	ID	Name	City	Mobile Number	Number of taken courses
1	1	Bo Dahl	Bromma	073564889	4
2	2	Ann Stål	Kista	073148964	3
3	3	Ebba Ryd	Bromma		3
4	4	Robert Ahl	Kista	073552491	1
5	5	Lars Holm	Solna		3
6	6	Siw Björk	Kista		4
7	7	Sigge Ehn	Kista	073691934	2
8	8	Kurt Grahn	Bro	073318175	3
9	9	Eva Jung	Solna	073559185	3
10	10	Lola Frid	Täby	073292612	3

Question 06

Get the total cost per student based on their participations! All students shall be included in the result.

SOLUTION IN IBM DB2

```
select xmlelement(NAME "Result",
                  xmlagg(
                    xmlelement(NAME "Student",
                                xmlattributes(
                                    sid as "ID",
                                    sname as "Name",
                                    xmlcast(xmlquery('$CONTACT//address/@city') as
varchar(50)) as "City",
                                (select count(*) from participation p where
p.student = sid) as "NumberOfParticipations",
                                (
                                    select
sum(xmlcast(xmlquery('$INFO//price') as integer))
                                    from participation p          inner join
courseoffering co on p.startdate=co.startdate and p.course=co.course

                                    inner join course c on co.course=c.coursecode
                                    where p.student = sid
                                ) as "TotalCost"
                                )
                    )
                )
            )
from student;
```

```
select  xmlelement(NAME "Result",
                xmlagg(
                    xmlelement(NAME "Student",
                                xmlattributes(
                                    sid as "ID",
                                    sname as "Name",
                                    xmlcast(xmlquery('$CONTACT//address/@city') as varchar(50)) as "City",
                                    (select count(*) from participation p where p.student = sid) as "NumberOfParticipations",
                                    (
                                        select sum(xmlcast(xmlquery('$INFO//price') as integer))
                                        from participation p          inner join courseoffering co on p.startdate=co.startdate and p.course=co.course
                                        inner join course c on co.course=c.coursecode
                                        where p.student = sid
                                    ) as "TotalCost"
                                    )
                                )
                    )
                )
            )
from student;
```

RESULT

```
<Result>  
  <Student ID="1" Name="Bo Dahl" City="Bromma"  
    NumberOfParticipations="4" TotalCost="22200" />  
  <Student ID="2" Name="Ann Stål" City="Kista"  
    NumberOfParticipations="3" TotalCost="15500" />  
  <Student ID="3" Name="Ebba Ryd" City="Bromma"  
    NumberOfParticipations="3" TotalCost="12300" />  
  <Student ID="4" Name="Robert Ahl" City="Kista"  
    NumberOfParticipations="1" TotalCost="4500" />  
  <Student ID="5" Name="Lars Holm" City="Solna"  
    NumberOfParticipations="3" TotalCost="13300" />  
  <Student ID="6" Name="Siw Björk" City="Kista"  
    NumberOfParticipations="4" TotalCost="25900" />  
  <Student ID="7" Name="Sigge Ehn" City="Kista"  
    NumberOfParticipations="2" TotalCost="12000" />  
  <Student ID="8" Name="Kurt Grahn" City="Bro"  
    NumberOfParticipations="3" TotalCost="19900" />  
  <Student ID="9" Name="Eva Jung" City="Solna"  
    NumberOfParticipations="3" TotalCost="19400" />  
  <Student ID="10" Name="Lola Frid" City="Täby"  
    NumberOfParticipations="3" TotalCost="15500" />  
</Result>
```