**5.13** Suppose you were asked to define a class MetaDisplay in Java, containing a method static void printTable(String r); the method takes a relation name *r* as input, executes the query “**select** \* **from** *r*”, and prints the result out in nice tabular format, with the attribute names displayed in the header of the table.  
a. What do you need to know about relation *r* to be able to print the  
result in the specified tabular format.  
b. What JDBC methods(s) can get you the required information?  
c. Write the method printTable(String r) using the JDBC API

Solution:

1. 需要知道属性的个数和r当中属性的名称
2. getColumnCount() , getColumnName(int)

c.

static void printable(String r)

{

try{

Class.forName("oraclejdbc.driver.OracleDriver");

Connection conn = DriverManager.getConnection(

"test.db",user,passwd);

Statement stmt = conn.createStatement();

ResultSet rs = stmt.ExecuteQuery(r);

ResultSetMetaData rsmd = rs.getMetaData();

int count = rsmd.getColumnCount();

System.out.println("<tr>");

for(int i=1;i<=count;i++){

System.out.println("<td>"+rsmd.getColumnName(i)+"</td>");

}

System.out.println("</tr>");

while(rs.next(){

System.out.println("<tr>");

for(int i=1;i<=count;i++){

System.out.println("<td>"+rs.getString(i)+"</td>");

}

System.out.println("</tr>");

}

stmt.close();

conn.close();

}

catch(SQLException e)

{

System.out.println(e)

}

}

**5.15** Consider an employee database with two relations

*employee* (*employee name*, *street*, *city*)  
*works* (*employee name*, *company name*, *salary*)

where the primary keys are underlined. Write a query to find companies whose employees earn a higher salary, on average, than the average salary at “First Bank Corporation”.

a. Using SQL functions as appropriate.  
b. Without using SQL functions.

Solution:

a.

***create*** ***function*** avg\_sal(c\_name ***varchar***(15))

***return*** ***integer***

***begin***

***declare*** res ***integer***;

***select*** avg(salary) ***into*** res

***from*** works

***where*** works.company\_name = c\_name

***return*** result

***end***

***select*** company\_name

***from*** works

***where*** avg\_sal(company\_name) > avg\_salary(‘First Bank Corporation’)

b.

***select*** company\_name

***from*** works

***group*** ***by*** company\_name

***having*** ***avg***(salary) > (***select*** ***avg***(salary) ***from*** works ***where*** company\_name = ‘First Bank Corporation’)

**5.24** For each of the SQL aggregate functions **sum, count, min**, and **max**, show how to compute the aggregate value on a multiset *S*1 ∪ *S*2, given the aggregate values on multisets *S*1 and *S*2. On the basis of the above, give expressions to compute aggregate values with grouping on a subset *S* of the attributes of a relation *r*(*A*, *B*, *C*, *D*, *E*), given aggregate values for grouping on attributes *T* ⊇ *S*, for the following aggregate functions:  
a. **sum, count, min,** and **max**b. **avg**c. Standard deviation

Solution:

***sum***(s1 ∪ s2) = ***sum***(s1) + ***sum***(s2)

***count***(s1 ∪ s2) = ***count***(s1) + ***count***(s2)

***min***(s1 ∪ s2) = ***min***(***min***(s1), ***min***(s2))

***max***(s1 ∪ s2) = ***max***(***max***(s1), ***max***(s2))