**实验九 数据库的接口编程**

**一、实验项目名称**

数据库的接口编程

**二、实验目的**

本实验为设计性实验。通过设计一个简单的以Oracle数据库为后台的数据库应用程序，掌握数据库的接口编程技术。

**三、实验环境**

Windows 8.1 + Oracle 11g

**四、实验内容**

以Oracle 11g数据库为后台，任选开发工具，开发一个小的应用系统。完成以下功能：

对自己创建的方案中的emp表完成插入、删除、修改和查询等操作。

**五．实验步骤**

本实验通过Eclipse中的插件Windows Builder创建Java窗口，使用Oracle 11g自带的Jar包classes12连接到数据库，实现了EMP表的增删改查的功能。

**六、源程序清单、测试数据、结果**

ConnectToOracle.java

package test;

import java.sql.Connection;

import java.sql.DriverManager;

import java.sql.SQLException;

public class ConnectToOracle

{

private String Driver = "oracle.jdbc.driver.OracleDriver";

private String Con = "jdbc:oracle:thin:@127.0.0.1:1521:login";

private String UserName = "system";

private String Password = "19951122";

private Connection con = null;

public ConnectToOracle()

{

try

{

Class.forName(Driver);

con = DriverManager.getConnection(Con, UserName, Password);

}

catch (Exception e)

{

e.printStackTrace();

}

}

public Connection GetConnection() throws SQLException

{

if(con == null)

{

con = DriverManager.getConnection(Con, UserName, Password);

}

return con;

}

}

EMPManager.java

package test;

import java.awt.EventQueue;

import javax.swing.JFrame;

import javax.swing.JOptionPane;

import javax.swing.JScrollPane;

import javax.swing.JButton;

import javax.swing.JTable;

import javax.swing.table.DefaultTableModel;

import java.awt.event.MouseAdapter;

import java.awt.event.MouseEvent;

import java.sql.Connection;

import java.sql.ResultSet;

import java.sql.ResultSetMetaData;

import java.sql.SQLException;

import java.sql.Statement;

import java.util.Vector;

public class EMPManager

{

private JFrame frame;

private JTable table = new JTable();

ConnectToOracle CTO = new ConnectToOracle();

Connection con = CTO.GetConnection();

Statement stmt = con.createStatement();

protected DefaultTableModel defaultModel;

protected JScrollPane scrollPane;

public static void main(String[] args)

{

EventQueue.*invokeLater*(new Runnable()

{

public void run()

{

try

{

EMPManager window = new EMPManager();

window.frame.setVisible(true);

}

catch(Exception e)

{

e.printStackTrace();

}

}

});

}

public EMPManager() throws SQLException

{

initialize();

Fresh();

}

private void initialize() throws SQLException

{

frame = new JFrame();

frame.setBounds(350,150,560,370);

frame.setDefaultCloseOperation(JFrame.*EXIT\_ON\_CLOSE*);

frame.getContentPane().setLayout(null);

JButton SelBtn = new JButton("\u67E5\u8BE2");

SelBtn.setBounds(450,285,70,25);

frame.getContentPane().add(SelBtn);

JButton AddBtn = new JButton("\u65B0\u589E");

AddBtn.addMouseListener(new MouseAdapter()

{

public void mouseClicked(MouseEvent e)

{

new AddEMP(stmt,frame,"添加新员工",true);

Fresh();

}

});

AddBtn.setBounds(30,285,70,25);

frame.getContentPane().add(AddBtn);

JButton UpdateBtn = new JButton("\u4FEE\u6539");

UpdateBtn.addMouseListener(new MouseAdapter()

{

public void mouseClicked(MouseEvent e)

{

if(table.getSelectedRow() == -1 || table == null)

{

JOptionPane.*showMessageDialog*(frame,"请先选择一行数据");

return;

}

else

{

String num = table.getValueAt(table.getSelectedRow(),0).toString();

try

{

new UpdateEMP(stmt,num,frame,"修改员工信息",true);

Fresh();

}

catch (SQLException e1)

{

e1.printStackTrace();

}

}

}

});

UpdateBtn.setBounds(310,285,70,25);

frame.getContentPane().add(UpdateBtn);

JButton btnNewButton = new JButton("\u5220\u9664");

btnNewButton.addMouseListener(new MouseAdapter()

{

public void mouseClicked(MouseEvent e)

{

if(table.getSelectedRow() == -1 || table == null)

{

JOptionPane.*showMessageDialog*(frame, "请先选择一行数据");

return;

}

else

{

String num = table.getValueAt(table.getSelectedRow(),0).toString();

try

{

String SQL = "Delete From EMP Where EMPNO = " + num;

stmt.executeUpdate(SQL);

JOptionPane.*showMessageDialog*(frame, "删除成功");

Fresh();

}

catch (SQLException e1)

{

e1.printStackTrace();

}

}

}

});

btnNewButton.setBounds(170, 285, 70, 25);

frame.getContentPane().add(btnNewButton);

SelBtn.addMouseListener(new MouseAdapter()

{

public void mouseClicked(MouseEvent e)

{

Fresh();

}

});

}

private void Fresh()

{

if(defaultModel != null)

{

frame.getContentPane().remove(scrollPane);

}

String SQL = "Select \* From EMP";

ResultSet rs = null;

try

{

rs = stmt.executeQuery(SQL);

}

catch (SQLException e1)

{

e1.printStackTrace();

}

Vector<String> Head = new Vector<String>();

Vector<Vector<String>> Body = new Vector<Vector<String>>();

try

{

ResultSetMetaData MetaData = rs.getMetaData();

for(int i = 1;i <= MetaData.getColumnCount();i++)

{

Head.add(MetaData.getColumnName(i));

}

while(rs.next())

{

Vector<String> Line = new Vector<String>();

for(int i = 1;i <= MetaData.getColumnCount();i++)

{

Line.add(rs.getString(i));

}

Body.add(Line);

}

}

catch (SQLException e2)

{

e2.printStackTrace();

}

defaultModel = new DefaultTableModel(Body,Head);

table = new JTable(defaultModel);

table.setCellSelectionEnabled(true);

scrollPane = new JScrollPane(table);

scrollPane.setBounds(20,20,500,250);

scrollPane.setEnabled(true);

frame.getContentPane().add(scrollPane);

}

}

AddEMP.java

package test;

import java.awt.BorderLayout;

import java.awt.GridLayout;

import java.awt.event.ActionEvent;

import java.awt.event.ActionListener;

import java.sql.SQLException;

import java.sql.Statement;

import javax.swing.\*;

public class AddEMP extends JDialog implements ActionListener

{

private static final long serialVersionUID = 429875240737530874L;

JPanel top,bottom,left;

JLabel EMPNO,ENAME,JOB,MGR,HIREDATE,SAL,COMM,DEPTNO;

JTextField empno,ename,job,mgr,hiredate,sal,comm,deptno;

JButton save,cancel;

Statement stmt;

public AddEMP(Statement stmt,JFrame owner,String title,boolean modal)

{

super(owner,title,modal);

this.stmt = stmt;

EMPNO = new JLabel("EMPNO",JLabel.CENTER);

ENAME = new JLabel("ENAME",JLabel.CENTER);

JOB = new JLabel("JOB",JLabel.CENTER);

MGR = new JLabel("MGR",JLabel.CENTER);

HIREDATE = new JLabel("HIREDATE",JLabel.CENTER);

SAL = new JLabel("SAL",JLabel.CENTER);

COMM = new JLabel("COMM",JLabel.CENTER);

DEPTNO = new JLabel("DEPTMO",JLabel.CENTER);

top = new JPanel(new GridLayout(8,1));

top.add(EMPNO);

top.add(ENAME);

top.add(JOB);

top.add(MGR);

top.add(HIREDATE);

top.add(SAL);

top.add(COMM);

top.add(DEPTNO);

empno = new JTextField(25);

ename = new JTextField(25);

job = new JTextField(25);

mgr = new JTextField(25);

hiredate = new JTextField(25);

sal = new JTextField(25);

comm = new JTextField(25);

deptno = new JTextField(25);

left = new JPanel(new GridLayout(8,1));

left.add(empno);

left.add(ename);

left.add(job);

left.add(mgr);

left.add(hiredate);

left.add(sal);

left.add(comm);

left.add(deptno);

bottom = new JPanel();

save = new JButton("保存");

cancel = new JButton("取消");

save.addActionListener(this);

cancel.addActionListener(this);

bottom.add(save);

bottom.add(cancel);

this.add(top,BorderLayout.CENTER);

this.add(left,BorderLayout.EAST);

this.add(bottom,BorderLayout.SOUTH);

this.setSize(400,300);

this.setLocation(400,250);

this.setVisible(true);

}

public void actionPerformed(ActionEvent e)

{

if(e.getSource() == save)

{

String SQL = "Insert Into EMP Values(" + empno.getText() + ",'" + ename.getText() + "','" + job.getText() + "'," + mgr.getText()

+ ",to\_timestamp('" + hiredate.getText() + "','yyyy-mm--dd hh24:mi:ss.ff')," + sal.getText() + "," + comm.getText() + "," + deptno.getText() + ")";

try

{

stmt.executeUpdate(SQL);

}

catch (SQLException e1)

{

e1.printStackTrace();

}

this.dispose();

}

if(e.getSource()==cancel)

{

this.dispose();

}

}

}

UpdateEMP.java

package test;

import java.awt.BorderLayout;

import java.awt.GridLayout;

import java.awt.event.ActionEvent;

import java.awt.event.ActionListener;

import java.sql.ResultSet;

import java.sql.SQLException;

import java.sql.Statement;

import javax.swing.\*;

public class UpdateEMP extends JDialog implements ActionListener

{

private static final long serialVersionUID = 429875240737530874L;

JPanel top,bottom,left;

JLabel EMPNO,ENAME,JOB,MGR,HIREDATE,SAL,COMM,DEPTNO;

JTextField empno,ename,job,mgr,hiredate,sal,comm,deptno;

JButton save,cancel;

Statement stmt;

public UpdateEMP(Statement stmt,String num,JFrame owner,String title,boolean modal) throws SQLException // 构造函数

{

super(owner,title,modal);

this.stmt = stmt;

String SQL = "Select \* From EMP Where EMPNO = " + num;

ResultSet rs = stmt.executeQuery(SQL);

rs.next();

EMPNO = new JLabel("EMPNO",JLabel.CENTER);

ENAME = new JLabel("ENAME",JLabel.CENTER);

JOB = new JLabel("JOB",JLabel.CENTER);

MGR = new JLabel("MGR",JLabel.CENTER);

HIREDATE = new JLabel("HIREDATE",JLabel.CENTER);

SAL = new JLabel("SAL",JLabel.CENTER);

COMM = new JLabel("COMM",JLabel.CENTER);

DEPTNO = new JLabel("DEPTNO",JLabel.CENTER);

top = new JPanel(new GridLayout(8,1));

top.add(EMPNO);

top.add(ENAME);

top.add(JOB);

top.add(MGR);

top.add(HIREDATE);

top.add(SAL);

top.add(COMM);

top.add(DEPTNO);

empno = new JTextField(25);

empno.setText(num);

empno.setEditable(false);

ename = new JTextField(25);

ename.setText(rs.getString(2));

job = new JTextField(25);

job.setText(rs.getString(3));

mgr = new JTextField(25);

mgr.setText(rs.getString(4));

hiredate = new JTextField(25);

hiredate.setText(rs.getString(5));

sal = new JTextField(25);

sal.setText(rs.getString(6));

comm = new JTextField(25);

comm.setText(rs.getString(7));

deptno = new JTextField(25);

deptno.setText(rs.getString(8));

left = new JPanel(new GridLayout(8,1));

left.add(empno);

left.add(ename);

left.add(job);

left.add(mgr);

left.add(hiredate);

left.add(sal);

left.add(comm);

left.add(deptno);

bottom = new JPanel();

save = new JButton("保存");

cancel = new JButton("取消");

save.addActionListener(this);

cancel.addActionListener(this);

bottom.add(save);

bottom.add(cancel);

this.add(top,BorderLayout.CENTER);

this.add(left,BorderLayout.EAST);

this.add(bottom,BorderLayout.SOUTH);

this.setSize(400,300);

this.setLocation(400,250);

this.setVisible(true);

}

public void actionPerformed(ActionEvent e)

{

if(e.getSource() == save)

{

String SQL = "Update EMP Set ENAME = '" + ename.getText() + "',JOB = '" + job.getText() + "',MGR = " + mgr.getText()

+ ",HIREDATE = to\_timestamp('" + hiredate.getText() + "','yyyy-mm--dd hh24:mi:ss.ff'),SAL = " + sal.getText() + ",COMM = " + comm.getText()

+ ",DEPTNO = " + deptno.getText() + " Where EMPNO = " + empno.getText() + "";

try

{

stmt.executeUpdate(SQL);

}

catch (SQLException e1)

{

e1.printStackTrace();

}

this.dispose();

}

if(e.getSource()==cancel)

{

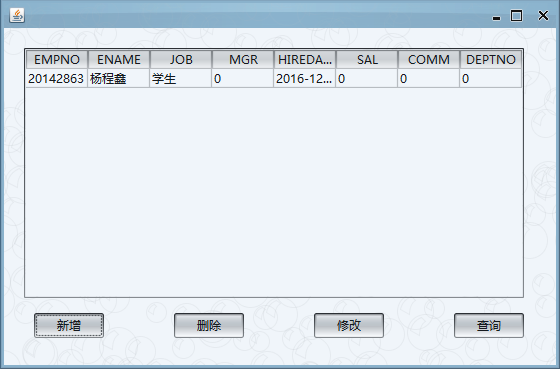
this.dispose();

}

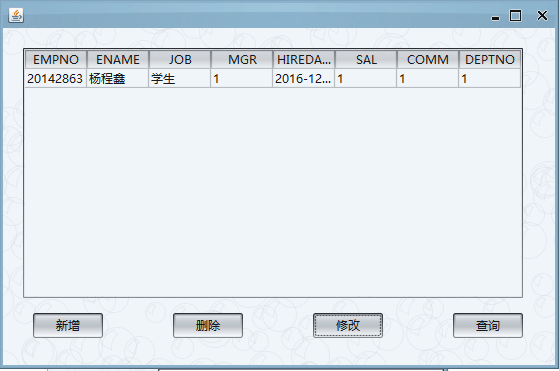
}

}









**七、实验小结和思考**

学会了创建index，view和sequence的方法，遇到的困难有，创建view的时候，如果不用求和就不用声明字段名，view的字段名默认为select表中的字段名。明白了OEM中更多选项的功能。