**设计目的**

利用上课所学的C#与MapGIS10的相关知识自己独立设计一个程序，使之实现一个简单的登录以及地图操作功能并成功运行。

**开发平台及环境**

开发平台： MapGIS10.0 Visual Studio2010

开发环境： Windows2010

开发语言： C#

1. **功能实现**

**（1）登录功能及要求：**

1错误提示：用户名为gis，密码为学号后3位，不正确的用户名和密码具有提示功能。

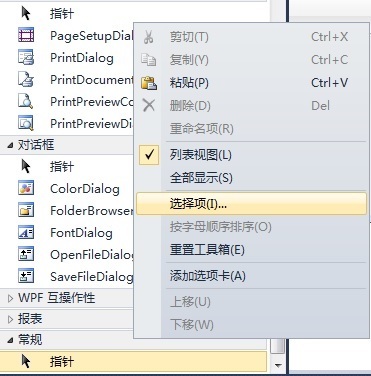
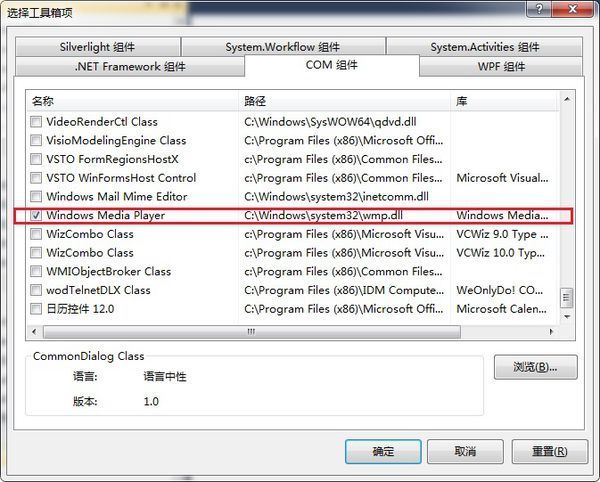
2. 验证用户名和密码后方可进入地图操作功能界面。

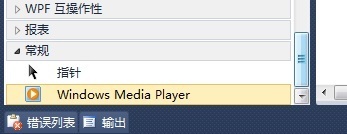
**1）打开Visual Studio2010，选择窗体应用程序（所有的软件与歌曲都存在了G盘）**

**2）在设计界面拖放两个Label,一个Panel,两个Button,两个TextBox.对它们进行如下设计**

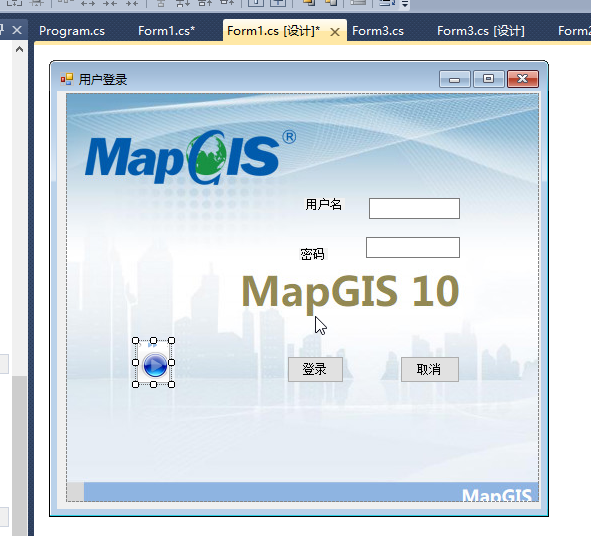
|  |  |
| --- | --- |
| **控件** | **说明** |
| **Label** | **Text:用户名** |
| **Label** | **Text:密码** |
| **Panel** | **BackgroundImage:导入图。置于底层** |
| **Button** | **Name:btn\_Login,Text:登录** |
| **Button** | **Name ：btn\_Cancel,Text:取消** |
| **TextBox** | **Name:txt\_Name** |
| **TextBox.** | **Name:txt\_Pwd；PassWordChar:\*;MaxLength:3** |
| **Form** | **Text:用户登录** |

**3)** **添加 Windows Media Player** 在VS左侧的工具箱的“常规”栏中，点鼠标右键，菜单“选择项... 在窗口中选择“COM组件”，下拉，选择“Windows Media Player”。控件Windows Media Player出现在工具箱“常规”栏目中, 将控件拖到你的主窗体窗体上.



**设计界面如下**



**4）在窗体内输入以下代码设置播放音乐**

public Form1()

{

InitializeComponent();

axWindowsMediaPlayer1.settings.setMode("loop", true);

}

private void Form1\_Load(object sender, EventArgs e)

{

axWindowsMediaPlayer1.Ctlcontrols.play();//播放

axWindowsMediaPlayer1.settings.autoStart = true;

axWindowsMediaPlayer1.settings.volume = 100;//音量

ax WindowsMediaPlayer1.URL = @"G:\新建文件夹\海阔天空\_beyond h 黄家驹.mp3";

axWindowsMediaPlayer1.settings.autoStart = true; //自动播放

axWindowsMediaPlayer1.Ctlcontrols.currentPosition = 30; //当前的播放位置

}

**5)双击“登录”按钮和“取消”按钮，得到其事件处理函数**

登录

private void btn\_Login\_Click(object sender, EventArgs e)

{ string password = this.txt\_Pwd.Text;

string userName = txt\_Name.Text;

if (userName == null || password == null)

{ MessageBox.Show("用户名或密码不能为空，请重新输入");

return;

}

else if (userName = = "gis" && password = = "022")

{ this.DialogResult = System.Windows.Forms.DialogResult.OK;

}

else

{ MessageBox.Show("用户名为gis,密码为学号后三位");

return;

}

}

取消

private void btn\_Cancel\_Click(object sender, EventArgs e)

{

this.DialogResult = System.Windows.Forms.DialogResult.Cancel;

}

**6）根据模态对话框的结果运行主界面**

Form1 longForm = new Form1();

if (longForm.ShowDialog() == DialogResult.OK)

{

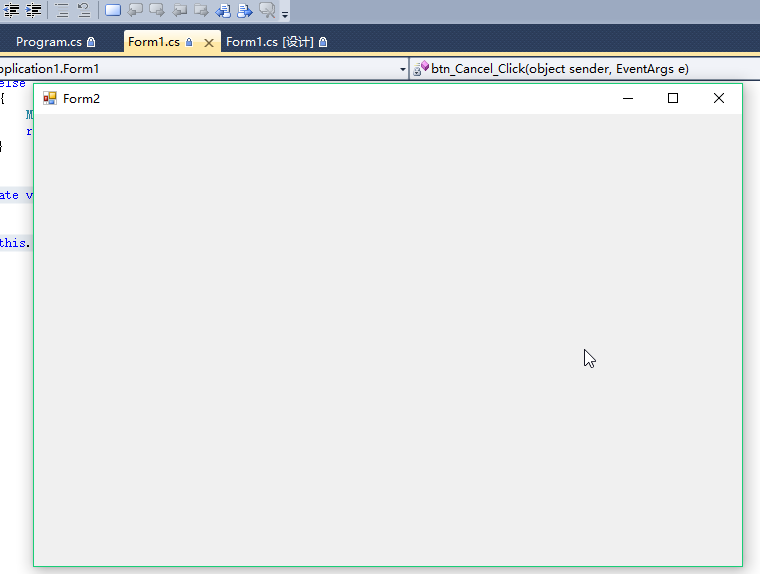
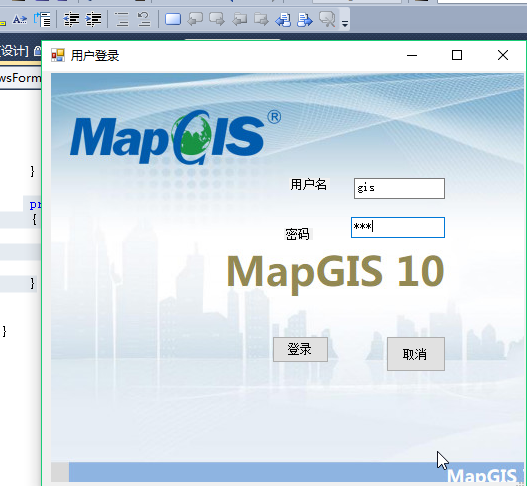
Form2 mainForm = new Form2();

Application.Run(mainForm);

**7）点击运行，出现登录界面后会自动播放“**海阔天空**”结果如下**

**当输入用户密码正确时弹出主界面Form2,结果如图1，2，不正确时结果为图3**

**图1 图2**



**图3**



2）地图操作功能及要求：

一、地图文档操作

1. 打开地图文档。

2. 地图文档另存为。

1. **右击解决方案——添加——windows窗体 添加窗体Form2.cs**

**2) 右击“引用“，选择 ”添加引用”，点击“浏览”选择mapgis10---progrom引用下面这三个类**

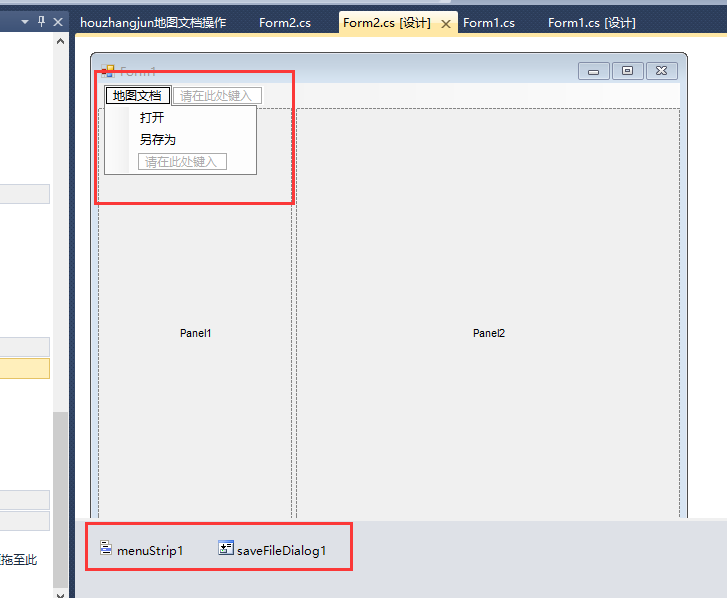
MapGIS.GISControl;

MapGIS.GeoMap;

MapGIS.UI.Controls;

**3） .加一个menustrip为“地图文档”,添加“打开”“另存为”两个子菜单**

**加入一个splitcontainer,一个saveFileDialog1**



**4）双击界面进入代码编辑**

namespace WindowsFormsApplication1

{

public partial class Form2 : Form

{ MapControl mapControl;

MapWorkSpaceTree mapTree;

AttControl attCtrl;

public Form2()

{

InitializeComponent();

mapTree = new MapWorkSpaceTree();

mapTree.Dock = DockStyle.Fill;

this.splitContainer1.Panel1.Controls.Add(mapTree);

mapControl = new MapControl();

this.splitContainer1.Panel2.Controls.Add(mapControl);

attCtrl = new AttControl();

this.splitContainer1.Panel2.Controls.Add(attCtrl);

mapControl.Width = this.splitContainer1.Panel2.Width;

mapControl.Height = this.splitContainer1.Panel2.Height / 3 \* 2;

attCtrl.Width = this.splitContainer1.Panel2.Width;

attCtrl.Height = this.splitContainer1.Panel2.Height / 3;

}

}

}

**5）找到panel2的事件Size change，设置它的大小。双击进入代码编辑。**

private void splitContainer1\_Panel2\_SizeChanged(object sender, EventArgs e)

{

if (mapControl != null)

{ mapControl.Width = this.splitContainer1.Panel2.Width;

mapControl.Height = this.splitContainer1.Panel2.Height / 3 \* 2;

attCtrl.Width = this.splitContainer1.Panel2.Width;

attCtrl.Height = this.splitContainer1.Panel2.Height / 3;

}

}

**6）双击设计界面进行如下编辑**

private void Form1\_Load(object sender, EventArgs e)

{

mapTree.Document.Title = "地图文档";

mapTree.Document.New();

Map aMap = new Map();

aMap.Name = "新地图";

mapTree.Document.GetMaps().Append(aMap);

this.mapControl.ActiveMap = aMap;

this.mapControl.Restore(); }

**7）.双击设计中的“打开”，进行地图文档打开编辑**

private void 打开ToolStripMenuItem\_Click(object sender, EventArgs e)

{ Document doc = mapTree.Document;

mapTree.Document.Open(@"G:\MapGIS 10\Sample\中国人口分布图.mapx ");

Maps mapList = doc.GetMaps();

mapControl.ActiveMap = mapList.GetMap(0);

mapControl.Restore();

}

**8）.双击设计中的“另存为”，进行地图文档保存编辑**

private void 另存为ToolStripMenuItem\_Click(object sender, EventArgs e)

{ saveFileDialog1.Filter =" map|\*.mapx";

if (saveFileDialog1.ShowDialog() == System.Windows.Forms.DialogResult.OK)

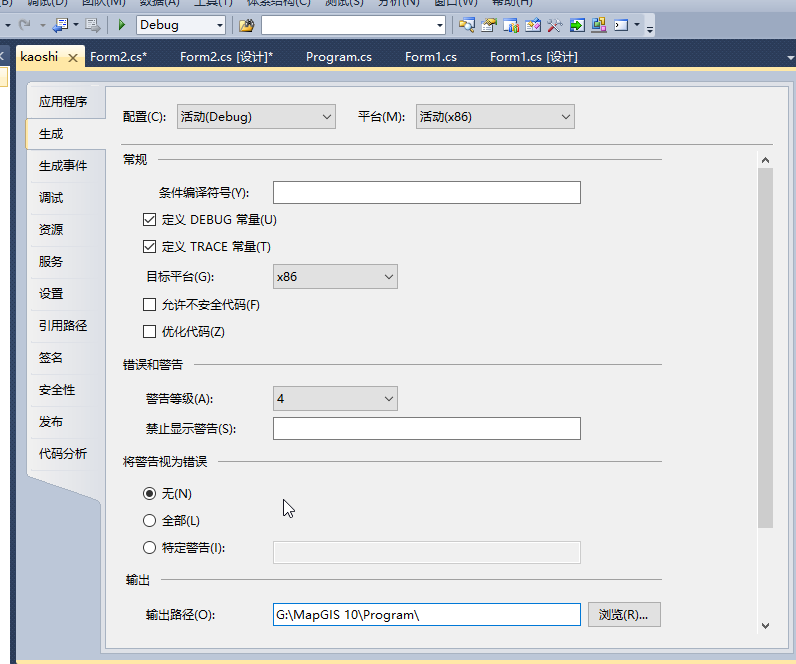
{ mapControl.Restore();

}

}

**9），更改输出路径**

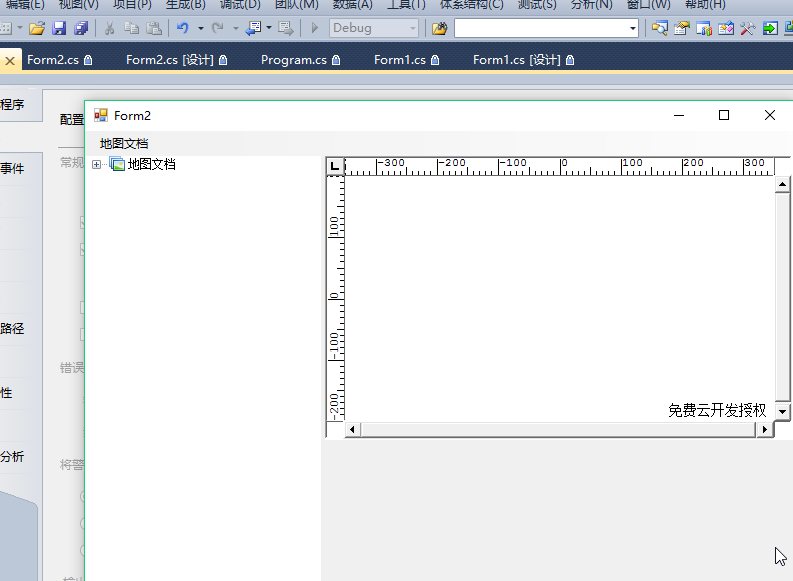
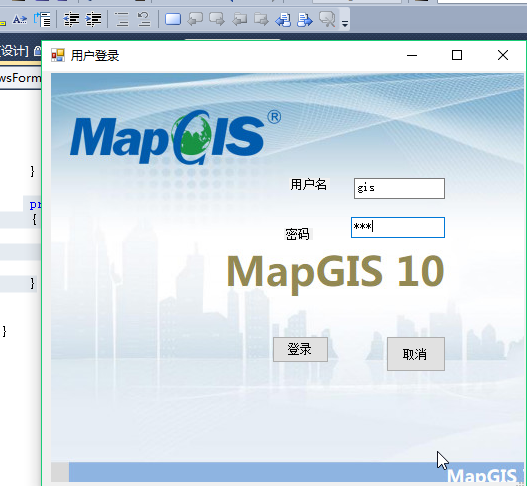
**点击“项目”——点击“生成”，找到“输出路径”，点击“浏览”选择“G:\MapGIS 10\Program\ “为输出路径。**



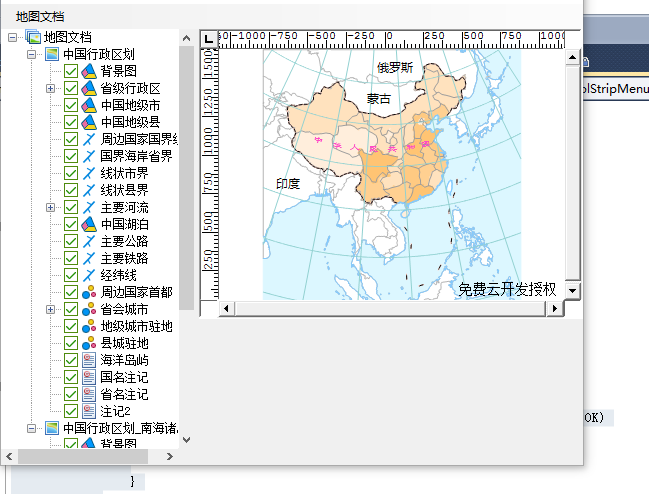
**10）**

1. **点击运行，出现用户登录界面并播放“海阔天空”，输入用户名：gis,密码：022。点击登录，进入地图操作界面。图1,2**
2. **点击“地图文档——打开”，出现中国人口分布图（见图3）。点击“另存为”弹出地图文档保存路径，选择保存在G:\MapGIS 10\Sample\中国人口分布图2（图4）**

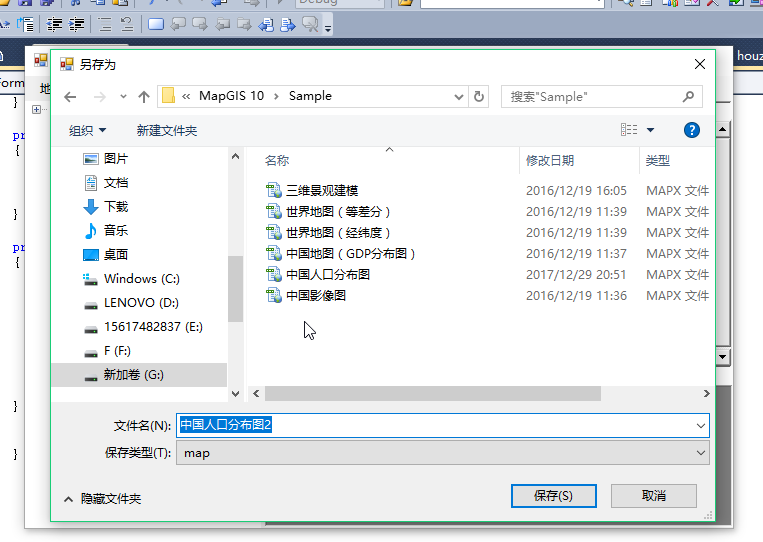
**图1 图2**



**图3**



**图4**



二、地图浏览

1. 实现地图的放大、缩小、平移、复位、刷新等功能。

1. **在“一，地图文档操作”的基础上实现**

**2）在menustrip上添加一个“地图浏览”并为它添加五个子菜单“放大、缩小、平移、复位、刷新”**

**依次双击放大、缩小、平移、复位、刷新进行编辑，主代码如下：**

mapControl.ZoomIn();

mapControl.ZoomOut();

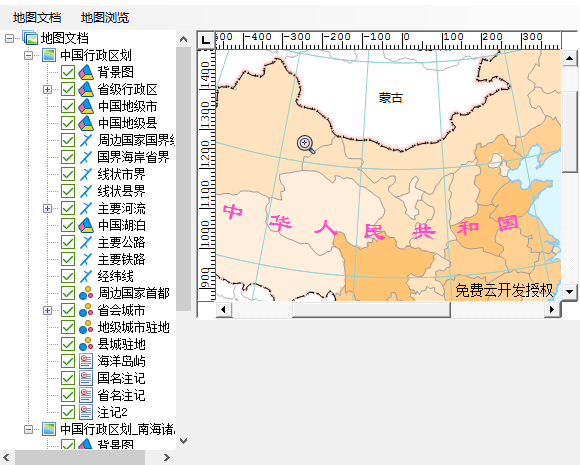
mapControl.Move();

mapControl.Restore();

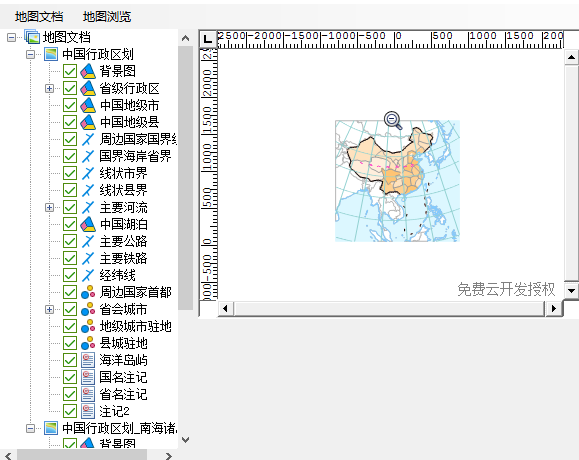
mapControl.Refresh();

**点击运行，出现用户登录界面，输入用户名：gis,密码：022。点击登录，进入地图操作界面。打开地图，依次点击地图浏览实现放大（图1）、缩小（图2）、平移（图3）、复位（图4）、刷新（图5）功能**

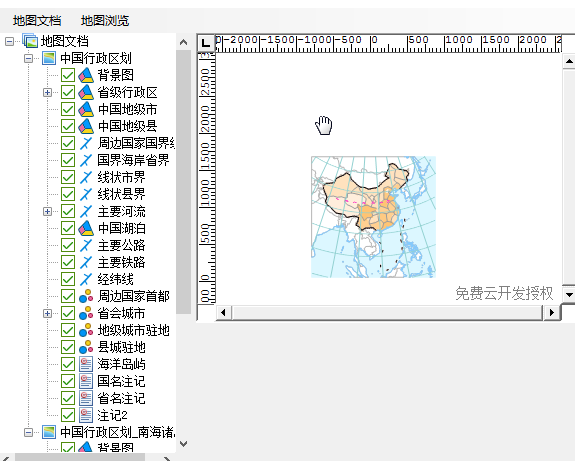
**图1**



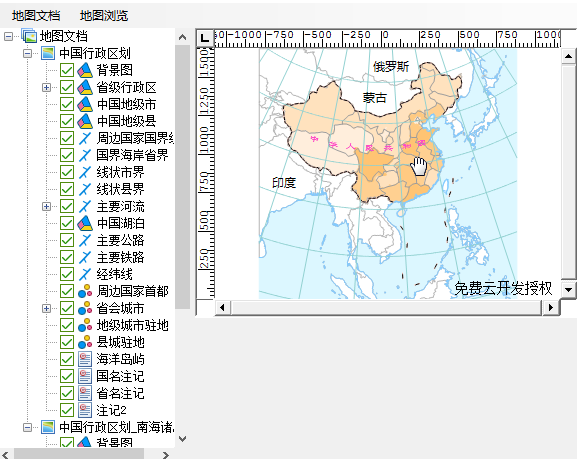
**图2**



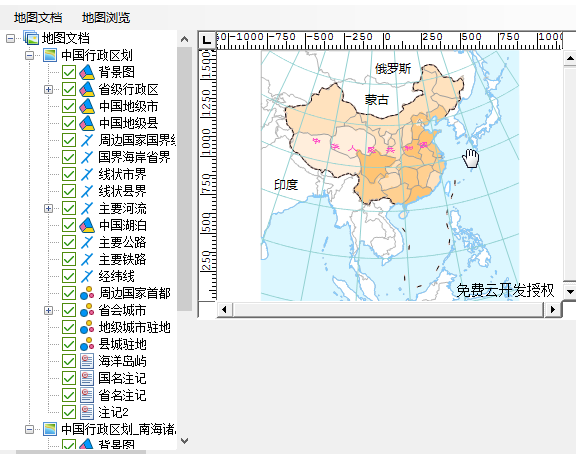
**图** **3**



**图4**



**图5**



2. 查看图层的非空间属性。

**1）右击解决方案——添加——windows窗体 添加窗体Form3**

**2）右击“引用“，选择”添加引用”，点击“浏览”选择mapgis10--progrom引用下面这四个类**

MapGIS.GeoDataBase;

MapGIS.GeoObjects.Geometry;

MapGIS.GeoObjects.Att;

MapGIS.WorkSpaceEngine;

**3）根据模态对话框的结果运行主界面**

Form1 longForm = new Form1();

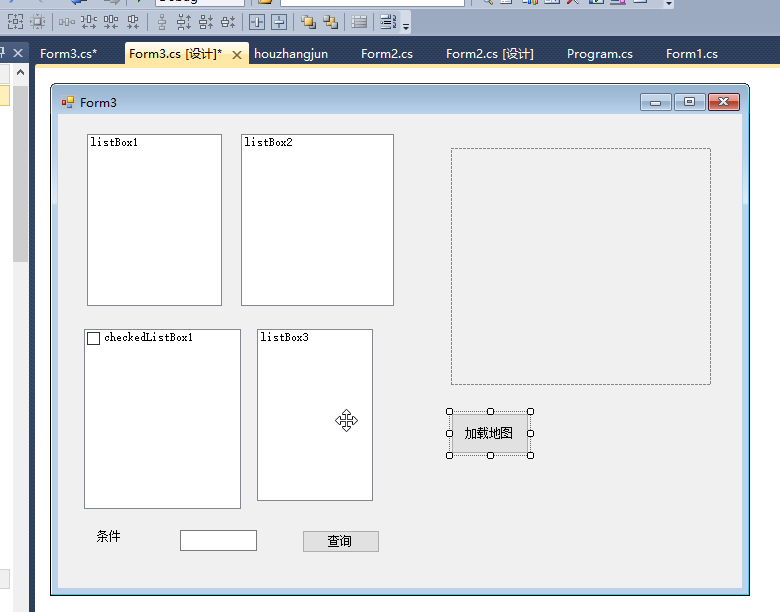
if (longForm.ShowDialog() == DialogResult.OK)

{ Form3 mainForm = new Form3();

Application.Run(mainForm);

}

**4)添加三个ListBox,一个ChecklistBox,两个Button名称为“加载地图”“查询”,一个Panel. 一个label,名称为“条件”。一个richTextBox。**



**5）引用Server.定义GDB.双击编辑**

public partial class Form3 : Form

{

Server Svr = new Server();

DataBase GDB = new DataBase();

MapControl mapControl = new MapControl();

public Form3()

{

InitializeComponent();

mapControl.Dock = DockStyle.Fill;

this.panel1.Controls.Add(mapControl);

}

**6）定义数据库，以表格要素类存储**

private void Form3\_Load(object sender, EventArgs e)

{ bool ok = Svr.Connect("MapGISLocal", "", "");

for (int i = 0; i < Svr.GDBIDs.Count; i++)

{

int id = Svr.GDBIDs[i];

string dbname = Svr.GetDBName(id);

listBox1.Items.Add(dbname);

}

}

**7）找到listbox1的事件：selected Index Change,双击编辑**

private void listBox1\_SelectedIndexChanged(object sender, EventArgs e)

{ listBox2.Items.Clear();

string selectName = listBox1.SelectedItem.ToString();

GDB = Svr.OpenGDB(selectName); //获取数据类的id

List<int> idlist = GDB.GetXclses(XClsType.Fds, 0);

for (int i = 0; i < idlist.Count; i++)

{ //获取数据集的名称

string dasetName = GDB.GetXclsName(XClsType.Fds, idlist[i]);

listBox2.Items.Add(dasetName);

listBox3.Items.Add(i.ToString());

}

}

**找到listbox2的事件：selected Index Change,双击编辑**

private void listBox2\_SelectedIndexChanged(object sender, EventArgs e)

{ List<int> idlist = GDB.GetXclses(XClsType.Fds, 0);

int selectID = idlist[listBox2.SelectedIndex];

//获取简单要素类的id

List<int> fclsssIdList = GDB.GetXclses(XClsType.SFCls, selectID);

for (int i = 0; i < fclsssIdList.Count; i++)

{

string fclassName = GDB.GetXclsName(XClsType.SFCls, fclsssIdList[i]);

checkedListBox1.Items.Add(fclassName);

}

}

**双击listBox3的事件SelectedIndexChange，进行编辑**

private void listBox3\_SelectedIndexChanged(object sender, EventArgs e)

{

textBox1.Clear();

string selectFCName = checkedListBox1.SelectedItems.ToString();

int selectFID = this.listBox3.SelectedIndex + 1;

SFeatureCls sfcls = new SFeatureCls(GDB);

IGeometry geometry = null;

Record record = null;

sfcls.Open(selectFCName, 1);

geometry = sfcls.GetGeometry(selectFID);

record = sfcls.GetAtt(selectFID);

for (int j = 0; j < record.Fields.Count; j++)

{

string fieldName = record.Fields[j].FieldName;

string fieldValue = record.get\_FldVal(j).ToString();

textBox1.AppendText(fieldName + ":" + fieldValue + ",");

}

}

**双击checkedListBox1的事件SelectedIndexChange，进行编辑**

private void checkedListBox1\_SelectedIndexChanged(object sender, EventArgs e)

{

string selectFCName = checkedListBox1.SelectedItem.ToString();

SFeatureCls sfcls = new SFeatureCls(GDB);

sfcls.Open(selectFCName, 1);

for (int i = 1; i < sfcls.Count; i++)

{ listBox3.Items.Add(i.ToString());

}

}

**8）双击button1，定义地图。**

private void button1\_Click(object sender, EventArgs e)

{

this.mapControl.ActiveMap = null;

this.mapControl.Restore();

Map map = new Map();

map.Name = "我的新地图";

for (int i = 0; i < checkedListBox1.CheckedItems.Count; i++)

{

string lyName = checkedListBox1.CheckedItems[i].ToString();

SFeatureCls featureClass = new SFeatureCls(GDB);

//打开数据源，填充数据

featureClass.Open(lyName, 1);

VectorLayer vectorLayer = new VectorLayer(VectorLayerType.SFclsLayer);

vectorLayer.AttachData(featureClass);

//添加图层

map.Append(vectorLayer);

this.mapControl.ActiveMap = map;

this.mapControl.Restore();

}

}

**双击Button2，进行编辑**

private void button2\_Click(object sender, EventArgs e)

{ textBox1.Clear();

string selectFCName = checkedListBox1.SelectedItem.ToString();

int selectFID = this.listBox3.SelectedIndex + 1;

SFeatureCls sfcls = new SFeatureCls(GDB);

sfcls.Open(selectFCName, 1);

QueryDef query = new QueryDef();

query.Filter = "省名黑龙江";

RecordSet recordSet = sfcls.Select(query);

recordSet.MoveFirst();

while (!recordSet.IsEOF)

{ Record record = recordSet.Att;

for (int j = 0; j < record.Fields.Count; j++)

{ string fieldName = record.Fields[j].FieldName;

string fieldValue = record.get\_FldVal(j).ToString();

textBox1.AppendText(fieldName + ":" + fieldValue + ",");

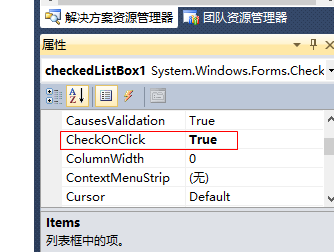
}

recordSet.MoveNext();

}

}

**9）选checklistbox属性 checkonclick,把它改为：true**



**10）点击运行，出现用户登录界面并播放“海阔天空”，输入用户名：gis,密码：022。点击登录（图1），点击登录进入Form3界面（图2）点击示例数据——兰伯特（全国）400万。勾选省级行政区，省会城市，点击“加载地图”出现地图（图3）。条件框中输入“黑龙江”可查询黑龙江（图4）**

**图1**

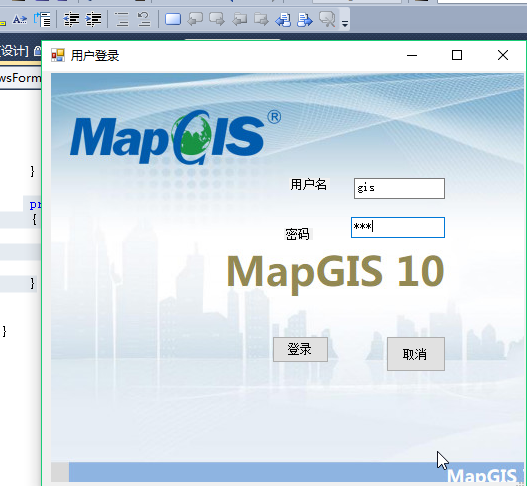


图2

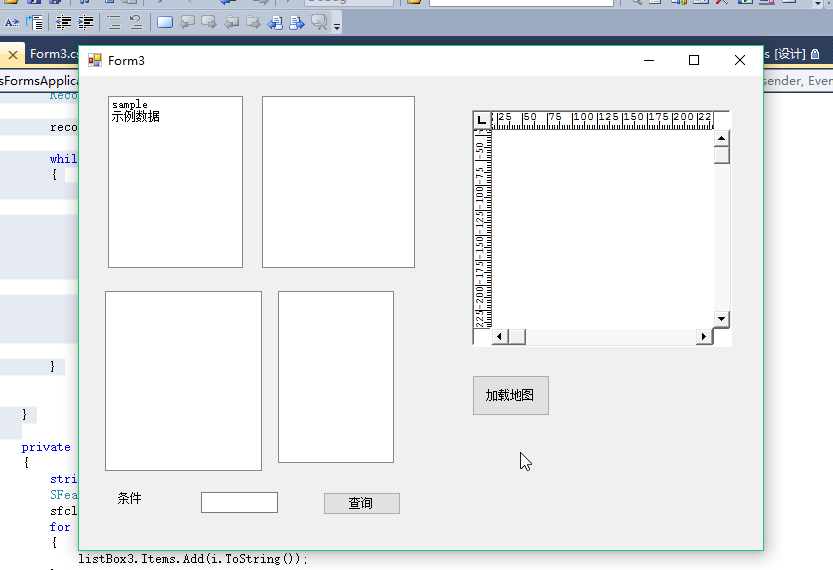


图3

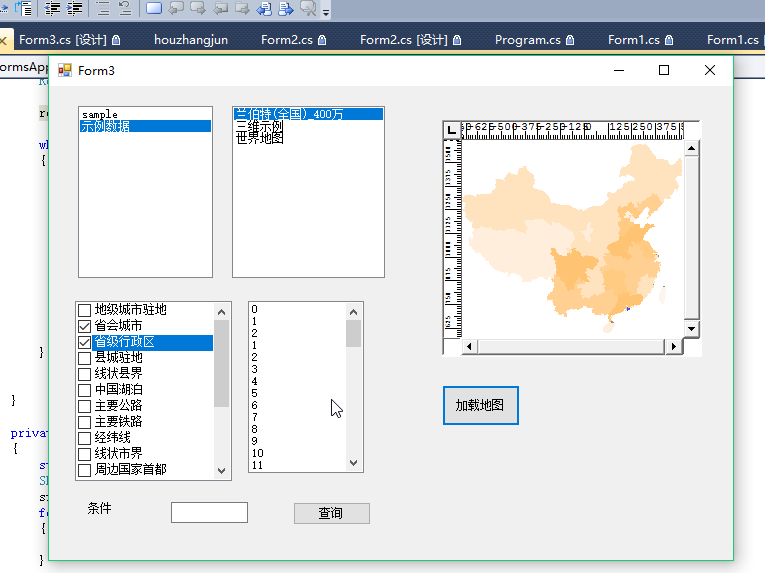
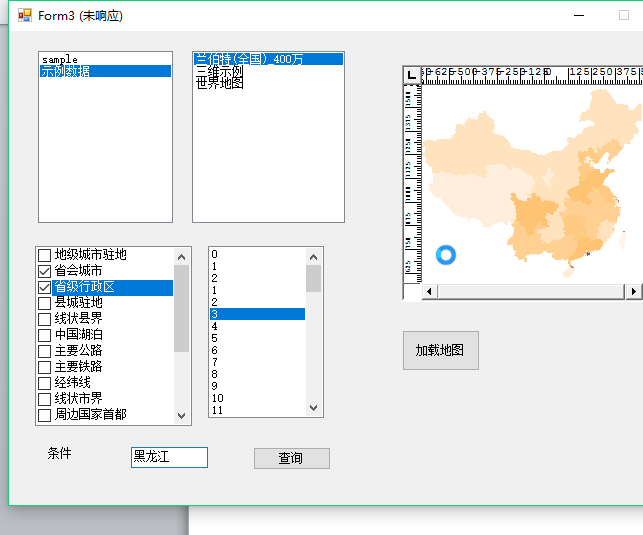


图4

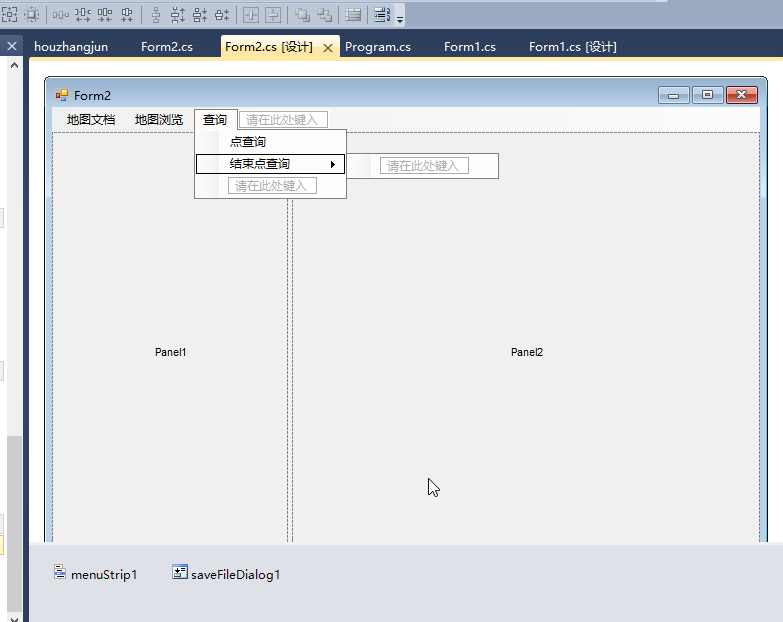


三、空间查询

1. 使用交互式查询，高亮显示点查询到的要素。

在“二地图浏览”的基础上实现此功能

1. **在menustrip上 “地图浏览”的右侧添加一个“查询”并为它添加两个子菜单“点查询”，“结束点查询”**



**2)**

**双击设计界面，添加引用**

using MapGIS.GeoDataBase;

using MapGIS.GeoObjects.Geometry;

using MapGIS.GeoObjects.Att;

using MapGIS.WorkSpaceEngine;

**属性表操作**

**添加定位：在public Form2()中添加**

attCtrl.Top = mapControl.Bottom;

**事件注册**

**在Form1\_Load中添加下面一行代码**

mapTree.MenuItemOnClickEvent += new MapGIS.WorkSpaceEngine.MenuItemOnClickHandler(mapTree\_MenuItemOnClickEvent);

**3）实现右键事件**

private void mapTree\_MenuItemOnClickEvent(string typeName, DocumentItem item)

{ VectorLayer vecLayer = item as VectorLayer;

//获取图层中的数据，矢量类对象基类接口

IVectorCls vecCls = vecLayer.GetData() as IVectorCls;

//查询数据，结果把保存在set中，查询定义存在def中

RecordSet redSet = null;

QueryDef qryDef = new QueryDef();

redSet = vecCls.Select(qryDef);

this.attCtrl.SetXCls(vecCls, redSet);

}

**4)依次双击“点查询”，“取消点查询”注册事件**

private void 点查询ToolStripMenuItem\_Click(object sender, EventArgs e)

{

mapControl.MouseUp+= new MouseEventHandler(mapControl\_MouseUp);

}

private void 结束点查询ToolStripMenuItem\_Click(object sender, EventArgs e)

{

mapControl.MouseUp+=new MouseEventHandler(mapControl\_MouseUp);

mapControl.EndFlash();

}

**5)获取鼠标点的X,Y位置，查询字段信息，遍历游标获取结果。从地图中获取要素类，构造地图上的点对象**

private void mapControl\_MouseUp(object sender, MouseEventArgs e)

{

mapControl.EndFlash();

Map map = this.mapControl.ActiveMap;

Transformation trans = this.mapControl.Transformation;

double geoX = 0;

double geoY = 0;

trans.WpToLp(e.X, e.Y, ref geoX, ref geoY);

Dot dot2 = new Dot();

dot2.X = geoX;

dot2.Y = geoY;

VectorLayer layer = map.get\_Layer(1) as VectorLayer;

SFeatureCls sfcls = layer.GetData() as SFeatureCls;

QueryDef query = new QueryDef();

query.SetNear(dot2, 0.2, 0.2);

RecordSet recordSet = sfcls.Select(query);

if (recordSet == null)

{ return;

}

recordSet.MoveFirst();

while (!recordSet.IsEOF)

{

Record record = recordSet.Att;

for (int j = 0; j < record.Fields.Count; j++)

{ string fieldName = record.Fields[j].FieldName;

if (record.get\_FldVal(j) != null)

{ string fieldValue = record.get\_FldVal(j).ToString();

}

}

this.mapControl.StartFlash(layer, recordSet.CurrentID, 200, 2, 7);

this.mapControl.Refresh();

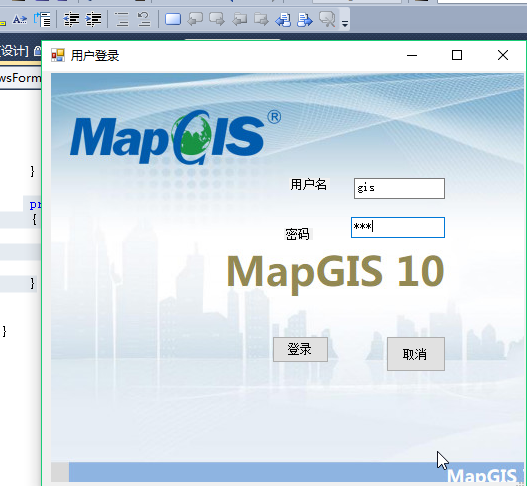
recordSet.MoveNext();

}

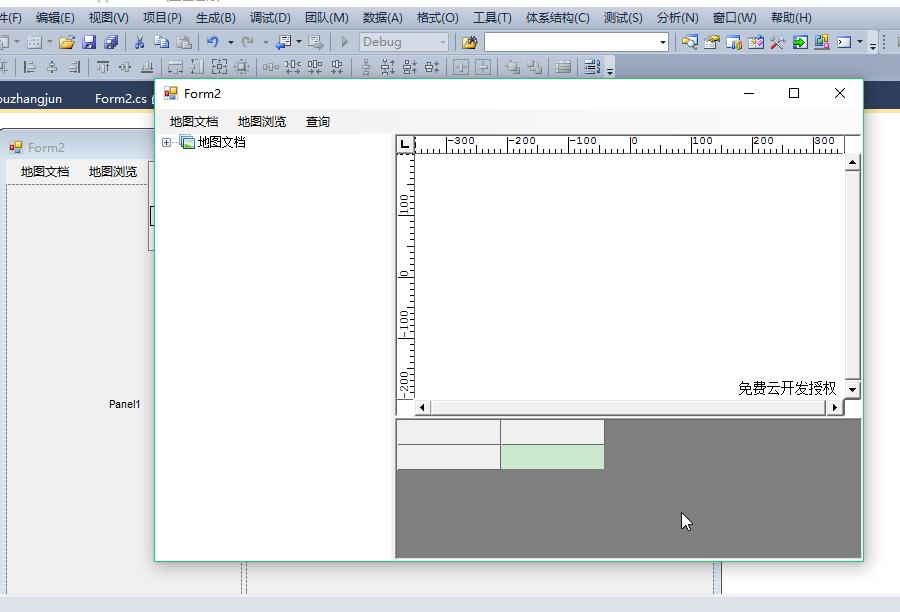
}

**6）点击运行，出现用户登录界面并播放“海阔天空”，输入用户名：gis,密码：022。点击登录（图1），进入地图操作界面（图2）。打开地图，点击“点查询”点击地图上的省份会以绿色和琥珀蓝两种颜色高亮闪烁显示（图3），点击“结束点查询”点查询点过的省份颜色消失，不再闪烁（图4）。右击“省级行政区——属性”在地图下面会出现省级行政区的属性表（图5）**

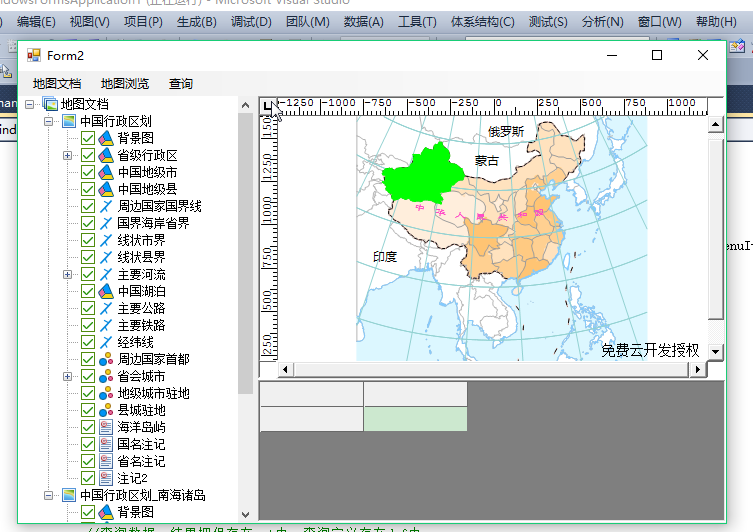
**图1**



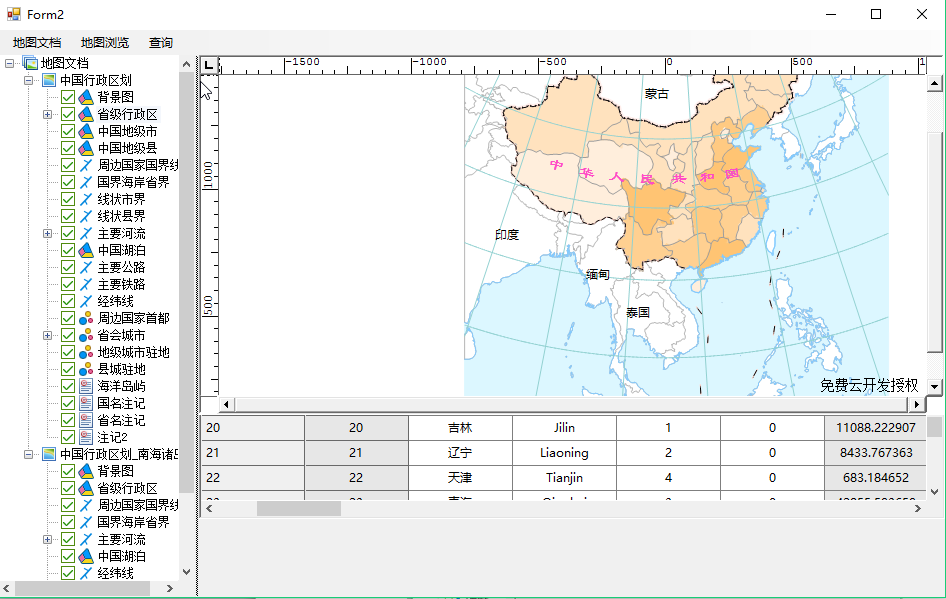
**图2**



**图3**



**图4**



**图5**

