

58 窗口设计

在这个案例中，借助QStandardItemModel模型和QTableView视图，构建一个简单的类似Excel的电子表格编辑器，实践自定义对话框的编程方法。第一步，先构建项目的基本框架和用户界面。

58.1 创建项目

通过QtCreator，在C:\Users\Minwei\Projects\Qt路径下，创建名为Sheet的项目。

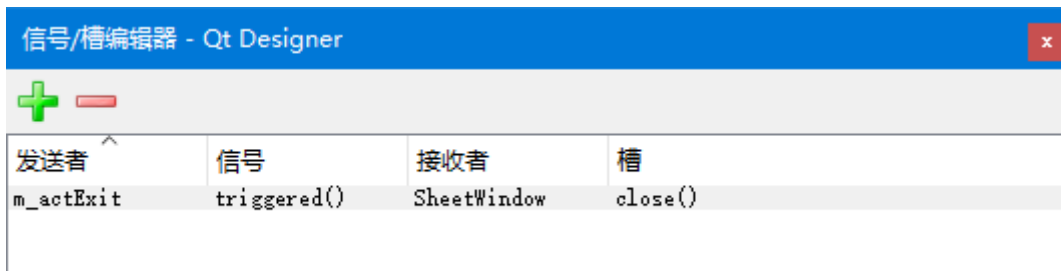
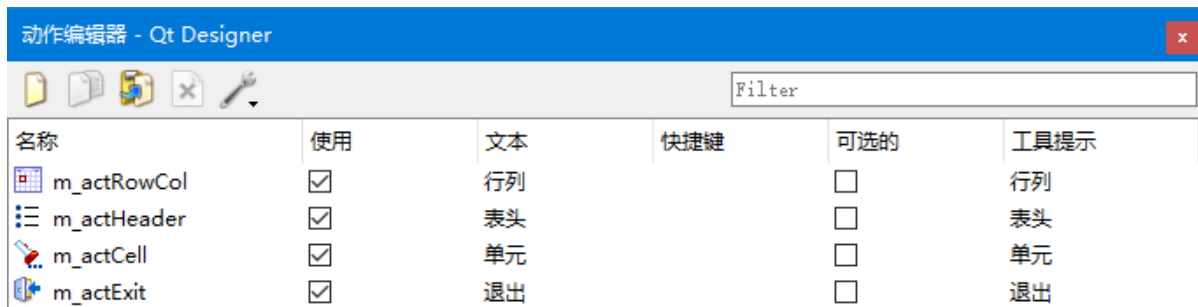
58.2 添加资源

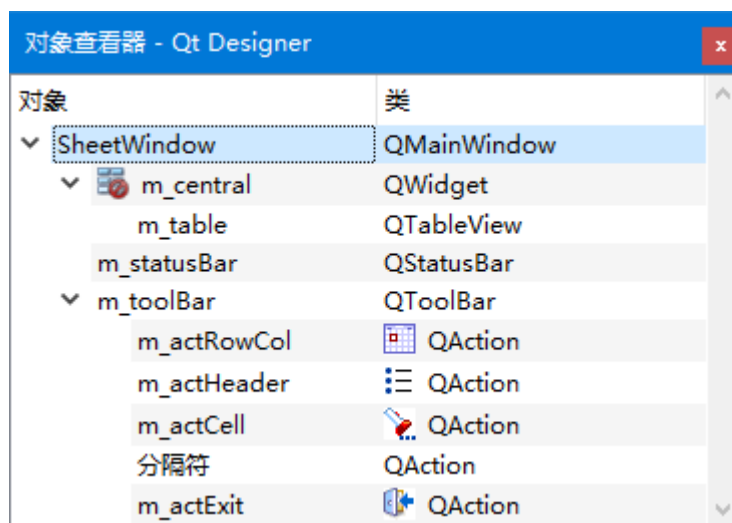
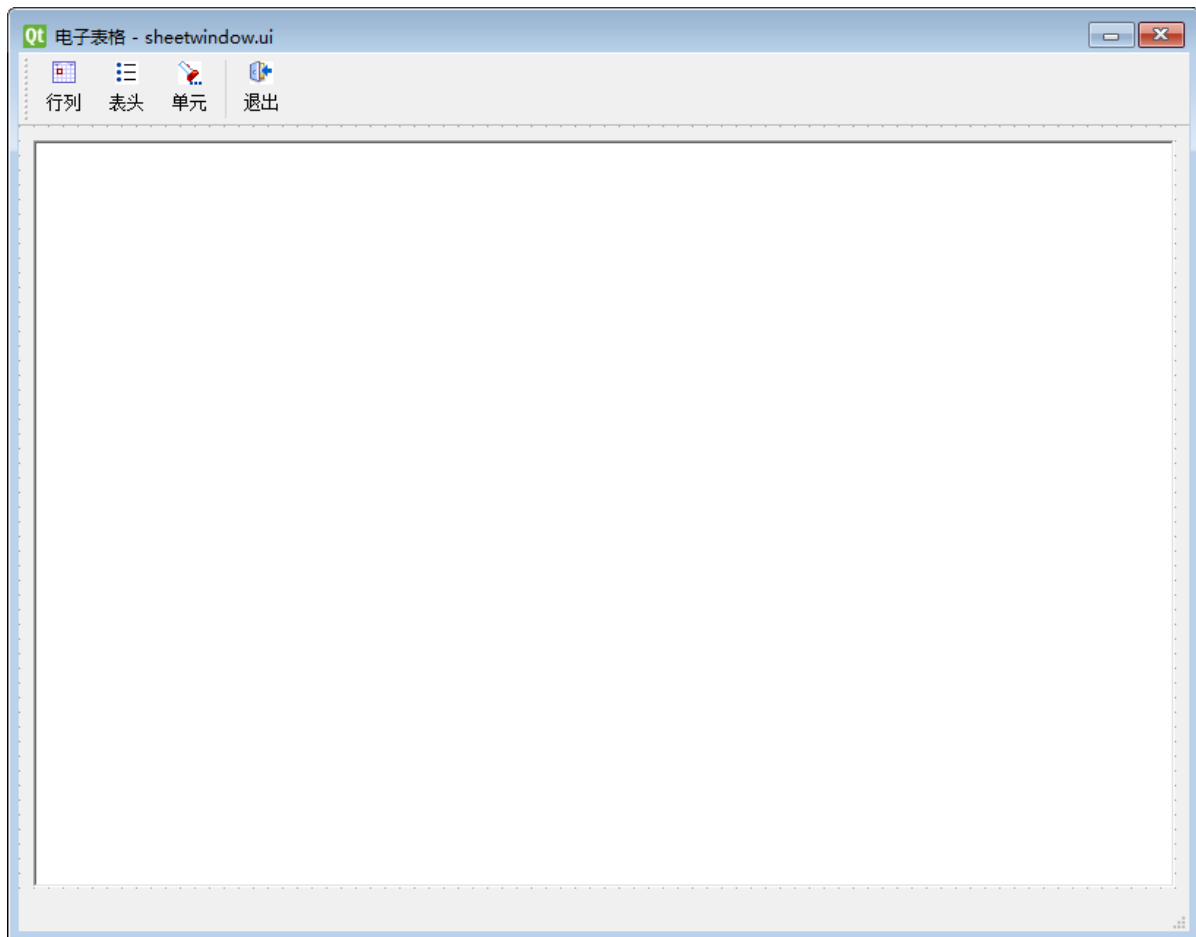
C:\Users\Minwei\Projects\Qt\Sheet\Sheet.qrc:

```
1 <RCC>
2     <qresource prefix="/">
3         <file>images/cell.bmp</file>
4         <file>images/exit.bmp</file>
5         <file>images/header.bmp</file>
6         <file>images/rowcol.bmp</file>
7     </qresource>
8 </RCC>
```

58.3 设计界面

58.3.1 主窗口





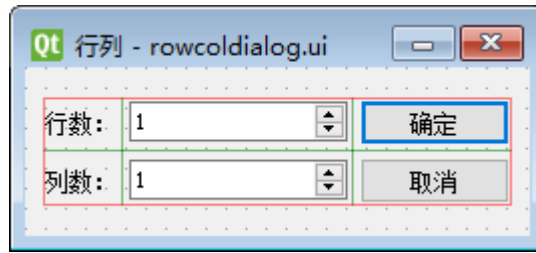
C:\Users\Minwei\Projects\Qt\Sheet\sheetwindow.ui:

```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <ui version="4.0">
3   <class>Sheetwindow</class>
4   <widget class="QMainWindow" name="Sheetwindow">
5     <property name="geometry">
6       <rect>
7         <x>0</x>
8         <y>0</y>
9         <width>800</width>
10        <height>600</height>
11      </rect>
12    </property>
13    <property name="windowTitle">
```

```
14     <string>电子表格</string>
15 </property>
16 <widget class="QWidget" name="m_central">
17     <widget class="QTableView" name="m_table">
18         <property name="geometry">
19             <rect>
20                 <x>10</x>
21                 <y>10</y>
22                 <width>780</width>
23                 <height>510</height>
24             </rect>
25         </property>
26         <property name="frameShape">
27             <enum>QFrame::WinPanel</enum>
28         </property>
29     </widget>
30 </widget>
31 <widget class="QStatusBar" name="m_statusBar"/>
32 <widget class="QToolBar" name="m_toolBar">
33     <property name="windowTitle">
34         <string>工具栏</string>
35     </property>
36     <property name="toolButtonStyle">
37         <enum>Qt::ToolButtonTextUnderIcon</enum>
38     </property>
39     <attribute name="toolBarArea">
40         <enum>TopToolBarArea</enum>
41     </attribute>
42     <attribute name="toolBarBreak">
43         <bool>>false</bool>
44     </attribute>
45     <addaction name="m_actRowCol"/>
46     <addaction name="m_actHeader"/>
47     <addaction name="m_actCell"/>
48     <addaction name="separator"/>
49     <addaction name="m_actExit"/>
50 </widget>
51 <action name="m_actRowCol">
52     <property name="icon">
53         <iconset resource="Sheet.qrc">
54             <normaloff>:/images/rowcol.bmp</normaloff>:/images/rowcol.bmp</iconset>
55     </property>
56     <property name="text">
57         <string>行列</string>
58     </property>
59     <property name="toolTip">
60         <string>行列</string>
61     </property>
62 </action>
63 <action name="m_actHeader">
64     <property name="icon">
65         <iconset resource="Sheet.qrc">
66             <normaloff>:/images/header.bmp</normaloff>:/images/header.bmp</iconset>
67     </property>
```

```
68     <property name="text">
69         <string>表头</string>
70     </property>
71     <property name="toolTip">
72         <string>表头</string>
73     </property>
74 </action>
75 <action name="m_actCell">
76     <property name="icon">
77         <iconset resource="Sheet.qrc">
78             <normaloff>:/images/cell.bmp</normaloff>:/images/cell.bmp</iconset>
79         </property>
80     <property name="text">
81         <string>单元</string>
82     </property>
83     <property name="toolTip">
84         <string>单元</string>
85     </property>
86 </action>
87 <action name="m_actExit">
88     <property name="icon">
89         <iconset resource="Sheet.qrc">
90             <normaloff>:/images/exit.bmp</normaloff>:/images/exit.bmp</iconset>
91         </property>
92     <property name="text">
93         <string>退出</string>
94     </property>
95 </action>
96 </widget>
97 <resources>
98     <include location="Sheet.qrc"/>
99 </resources>
100 <connections>
101     <connection>
102         <sender>m_actExit</sender>
103         <signal>triggered()</signal>
104         <receiver>Sheetwindow</receiver>
105         <slot>close()</slot>
106         <hints>
107             <hint type="sourcelabel">
108                 <x>-1</x>
109                 <y>-1</y>
110             </hint>
111             <hint type="destinationlabel">
112                 <x>399</x>
113                 <y>299</y>
114             </hint>
115         </hints>
116     </connection>
117 </connections>
118 </ui>
```

36.5.2 “行列”对话框



对象	类
RowColDialog	QDialog
m_layoutGrid	QGridLayout
m_btnCancel	QPushButton
m_btnOk	QPushButton
m_labCol	QLabel
m_labRow	QLabel
m_spinCol	QSpinBox
m_spinRow	QSpinBox
m_spacerDown	Spacer
m_spacerUp	Spacer

C:\Users\Minwei\Projects\Qt\Sheet\rowcoldialog.ui:

```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <ui version="4.0">
3 <class>RowColDialog</class>
4 <widget class="QDialog" name="RowColDialog">
5 <property name="geometry">
6 <rect>
7 <x>0</x>
8 <y>0</y>
9 <width>252</width>
10 <height>84</height>
11 </rect>
12 </property>
13 <property name="windowTitle">
14 <string>行列</string>
15 </property>
16 <layout class="QVBoxLayout" name="m_layoutVer">
17 <item>
18 <spacer name="m_spacerUp">
19 <property name="orientation">
20 <enum>Qt::Vertical</enum>
21 </property>
22 <property name="sizeHint" stdset="0">
23 <size>
24 <width>20</width>
25 <height>1</height>
26 </size>
27 </property>
28 </spacer>
29 </item>
30 <item>
```

```
31 <layout class="QGridLayout" name="m_layoutGrid">
32 <item row="0" column="0">
33 <widget class="QLabel" name="m_labRow">
34 <property name="text">
35 <string>行数: </string>
36 </property>
37 </widget>
38 </item>
39 <item row="0" column="1">
40 <widget class="QSpinBox" name="m_spinRow">
41 <property name="sizePolicy">
42 <sizepolicy hsizeType="Expanding" vsizeType="Fixed">
43 <horstretch>0</horstretch>
44 <verstretch>0</verstretch>
45 </sizepolicy>
46 </property>
47 <property name="minimum">
48 <number>1</number>
49 </property>
50 <property name="maximum">
51 <number>100</number>
52 </property>
53 </widget>
54 </item>
55 <item row="0" column="2">
56 <widget class="QPushButton" name="m_btnOk">
57 <property name="text">
58 <string>确定</string>
59 </property>
60 <property name="default">
61 <bool>true</bool>
62 </property>
63 </widget>
64 </item>
65 <item row="1" column="0">
66 <widget class="QLabel" name="m_labCol">
67 <property name="text">
68 <string>列数: </string>
69 </property>
70 </widget>
71 </item>
72 <item row="1" column="1">
73 <widget class="QSpinBox" name="m_spinCol">
74 <property name="sizePolicy">
75 <sizepolicy hsizeType="Expanding" vsizeType="Fixed">
76 <horstretch>0</horstretch>
77 <verstretch>0</verstretch>
78 </sizepolicy>
79 </property>
80 <property name="minimum">
81 <number>1</number>
82 </property>
83 <property name="maximum">
84 <number>100</number>
85 </property>
86 </widget>
```

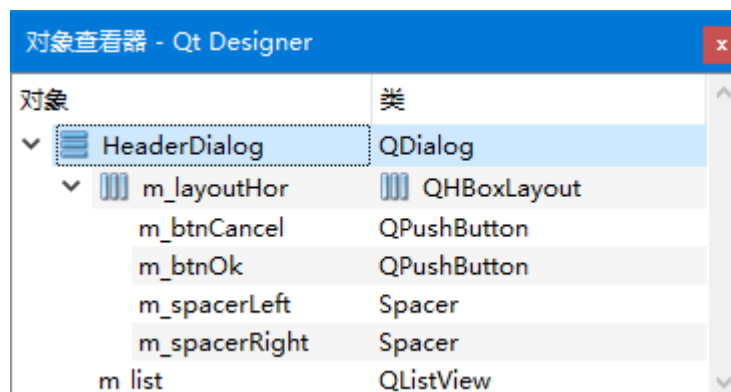
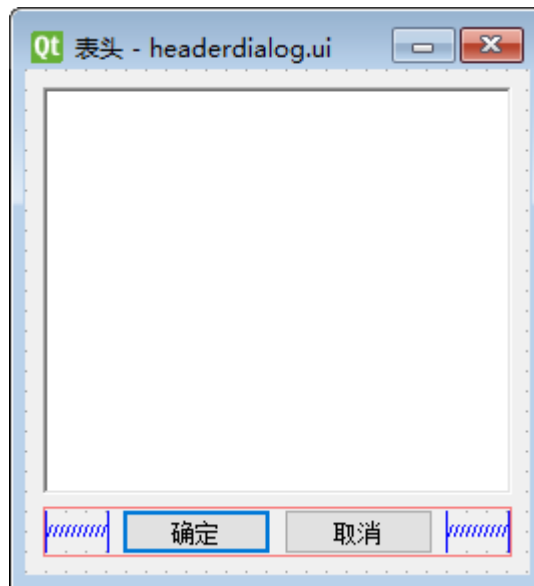
```
87     </item>
88     <item row="1" column="2">
89         <widget class="QPushButton" name="m_btnCancel">
90             <property name="text">
91                 <string>取消</string>
92             </property>
93         </widget>
94     </item>
95 </layout>
96 </item>
97 <item>
98     <spacer name="m_spacerDown">
99         <property name="orientation">
100             <enum>Qt::Vertical</enum>
101         </property>
102         <property name="sizeHint" stdset="0">
103             <size>
104                 <width>20</width>
105                 <height>2</height>
106             </size>
107         </property>
108     </spacer>
109 </item>
110 </layout>
111 </widget>
112 <resources/>
113 <connections>
114 <connection>
115     <sender>m_btnOk</sender>
116     <signal>clicked()</signal>
117     <receiver>RowColDialog</receiver>
118     <slot>accept()</slot>
119     <hints>
120         <hint type="sourcelabel">
121             <x>204</x>
122             <y>27</y>
123         </hint>
124         <hint type="destinationlabel">
125             <x>125</x>
126             <y>41</y>
127         </hint>
128     </hints>
129 </connection>
130 <connection>
131     <sender>m_btnCancel</sender>
132     <signal>clicked()</signal>
133     <receiver>RowColDialog</receiver>
134     <slot>reject()</slot>
135     <hints>
136         <hint type="sourcelabel">
137             <x>204</x>
138             <y>56</y>
139         </hint>
140         <hint type="destinationlabel">
141             <x>125</x>
142             <y>41</y>
```

```

143     </hint>
144 </hints>
145 </connection>
146 </connections>
147 </ui>

```

58.3.3 “表头”对话框



C:\Users\Minwei\Projects\Qt\Sheet\headerdialog.ui:

```

1 <?xml version="1.0" encoding="UTF-8"?>
2 <ui version="4.0">
3 <class>HeaderDialog</class>
4 <widget class="QDialog" name="HeaderDialog">
5 <property name="geometry">
6 <rect>
7 <x>0</x>
8 <y>0</y>
9 <width>252</width>
10 <height>252</height>
11 </rect>
12 </property>
13 <property name="windowTitle">
14 <string>表头</string>
15 </property>
16 <layout class="QVBoxLayout" name="m_layoutVer">
17 <item>
18 <widget class="QListView" name="m_list">

```



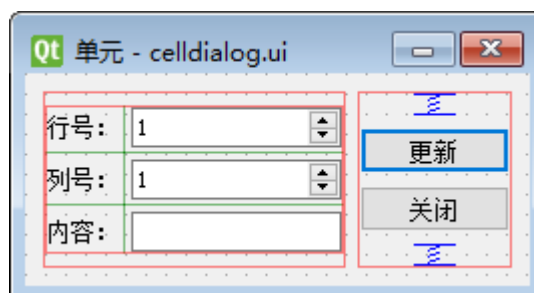
```
19     <property name="frameShape">
20         <enum>QFrame::WinPanel</enum>
21     </property>
22 </widget>
23 </item>
24 <item>
25     <layout class="QHBoxLayout" name="m_layoutHor">
26         <item>
27             <spacer name="m_spacerLeft">
28                 <property name="orientation">
29                     <enum>Qt::Horizontal</enum>
30                 </property>
31                 <property name="sizeHint" stdset="0">
32                     <size>
33                         <width>40</width>
34                         <height>20</height>
35                     </size>
36                 </property>
37             </spacer>
38         </item>
39         <item>
40             <widget class="QPushButton" name="m_btnOk">
41                 <property name="text">
42                     <string>确定</string>
43                 </property>
44                 <property name="default">
45                     <bool>true</bool>
46                 </property>
47             </widget>
48         </item>
49         <item>
50             <widget class="QPushButton" name="m_btnCancel">
51                 <property name="text">
52                     <string>取消</string>
53                 </property>
54             </widget>
55         </item>
56         <item>
57             <spacer name="m_spacerRight">
58                 <property name="orientation">
59                     <enum>Qt::Horizontal</enum>
60                 </property>
61                 <property name="sizeHint" stdset="0">
62                     <size>
63                         <width>40</width>
64                         <height>20</height>
65                     </size>
66                 </property>
67             </spacer>
68         </item>
69     </layout>
70 </item>
71 </layout>
72 </widget>
73 <resources/>
74 <connections>
```

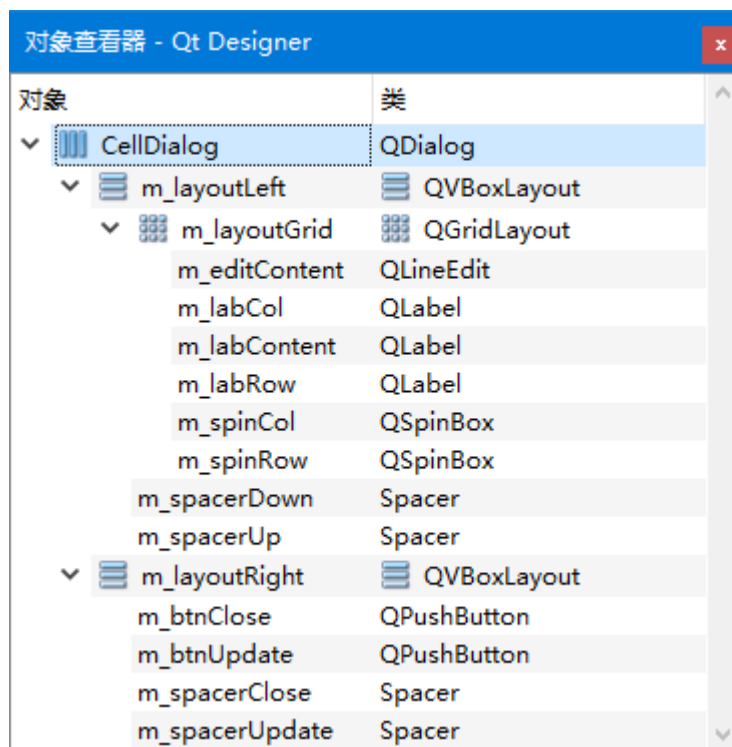
```

75 <connection>
76 <sender>m_btnOk</sender>
77 <signal>clicked()</signal>
78 <receiver>HeaderDialog</receiver>
79 <slot>accept()</slot>
80 <hints>
81 <hint type="sourcelabel">
82 <x>85</x>
83 <y>230</y>
84 </hint>
85 <hint type="destinationlabel">
86 <x>125</x>
87 <y>125</y>
88 </hint>
89 </hints>
90 </connection>
91 <connection>
92 <sender>m_btnCancel</sender>
93 <signal>clicked()</signal>
94 <receiver>HeaderDialog</receiver>
95 <slot>reject()</slot>
96 <hints>
97 <hint type="sourcelabel">
98 <x>166</x>
99 <y>230</y>
100 </hint>
101 <hint type="destinationlabel">
102 <x>125</x>
103 <y>125</y>
104 </hint>
105 </hints>
106 </connection>
107 </connections>
108 </ui>

```

58.3.4 “单元”对话框





C:\Users\Minwei\Projects\Qt\Sheet\celldialog.ui:

```

1  <?xml version="1.0" encoding="UTF-8"?>
2  <ui version="4.0">
3  <class>CellDialog</class>
4  <widget class="QDialog" name="CellDialog">
5  <property name="geometry">
6  <rect>
7  <x>0</x>
8  <y>0</y>
9  <width>252</width>
10 <height>106</height>
11 </rect>
12 </property>
13 <property name="windowTitle">
14 <string>单元</string>
15 </property>
16 <layout class="QHBoxLayout" name="m_layoutHor">
17 <item>
18 <layout class="QVBoxLayout" name="m_layoutLeft">
19 <item>
20 <spacer name="m_spacerUp">
21 <property name="orientation">
22 <enum>Qt::vertical</enum>
23 </property>
24 <property name="sizeHint" stdset="0">
25 <size>
26 <width>20</width>
27 <height>18</height>
28 </size>
29 </property>
30 </spacer>
31 </item>
32 <item>
33 <layout class="QGridLayout" name="m_layoutGrid">

```

```
34 <item row="0" column="0">
35 <widget class="QLabel" name="m_labRow">
36 <property name="text">
37 <string>行号: </string>
38 </property>
39 </widget>
40 </item>
41 <item row="0" column="1">
42 <widget class="QSpinBox" name="m_spinRow">
43 <property name="sizePolicy">
44 <sizepolicy hstretch="Expanding" vstretch="Fixed">
45 <horstretch>0</horstretch>
46 <verstretch>0</verstretch>
47 </sizepolicy>
48 </property>
49 <property name="minimum">
50 <number>1</number>
51 </property>
52 <property name="maximum">
53 <number>100</number>
54 </property>
55 </widget>
56 </item>
57 <item row="1" column="0">
58 <widget class="QLabel" name="m_labCol">
59 <property name="text">
60 <string>列号: </string>
61 </property>
62 </widget>
63 </item>
64 <item row="1" column="1">
65 <widget class="QSpinBox" name="m_spinCol">
66 <property name="sizePolicy">
67 <sizepolicy hstretch="Expanding" vstretch="Fixed">
68 <horstretch>0</horstretch>
69 <verstretch>0</verstretch>
70 </sizepolicy>
71 </property>
72 <property name="minimum">
73 <number>1</number>
74 </property>
75 <property name="maximum">
76 <number>100</number>
77 </property>
78 </widget>
79 </item>
80 <item row="2" column="0">
81 <widget class="QLabel" name="m_labContent">
82 <property name="text">
83 <string>内容: </string>
84 </property>
85 </widget>
86 </item>
87 <item row="2" column="1">
88 <widget class="QLineEdit" name="m_editContent"/>
89 </item>
```

```
90     </layout>
91 </item>
92 <item>
93     <spacer name="m_spacerDown">
94         <property name="orientation">
95             <enum>Qt::Vertical</enum>
96         </property>
97         <property name="sizeHint" stdset="0">
98             <size>
99                 <width>20</width>
100                <height>13</height>
101            </size>
102        </property>
103    </spacer>
104 </item>
105 </layout>
106 </item>
107 <item>
108 <layout class="QVBoxLayout" name="m_layoutRight">
109     <item>
110         <spacer name="m_spacerUpdate">
111             <property name="orientation">
112                 <enum>Qt::Vertical</enum>
113             </property>
114             <property name="sizeHint" stdset="0">
115                 <size>
116                     <width>20</width>
117                     <height>13</height>
118                 </size>
119             </property>
120         </spacer>
121     </item>
122     <item>
123         <widget class="QPushButton" name="m_btnUpdate">
124             <property name="text">
125                 <string>更新</string>
126             </property>
127             <property name="default">
128                 <bool>true</bool>
129             </property>
130         </widget>
131     </item>
132     <item>
133         <widget class="QPushButton" name="m_btnClose">
134             <property name="text">
135                 <string>关闭</string>
136             </property>
137         </widget>
138     </item>
139     <item>
140         <spacer name="m_spacerClose">
141             <property name="orientation">
142                 <enum>Qt::Vertical</enum>
143             </property>
144             <property name="sizeHint" stdset="0">
145                 <size>
```

```

146         <width>20</width>
147         <height>13</height>
148     </size>
149 </property>
150 </spacer>
151 </item>
152 </layout>
153 </item>
154 </layout>
155 </widget>
156 <resources/>
157 <connections>
158 <connection>
159     <sender>m_btnClose</sender>
160     <signal>clicked()</signal>
161     <receiver>CellDialog</receiver>
162     <slot>close()</slot>
163     <hints>
164         <hint type="sourcelabel">
165             <x>204</x>
166             <y>67</y>
167         </hint>
168         <hint type="destinationlabel">
169             <x>125</x>
170             <y>52</y>
171         </hint>
172     </hints>
173 </connection>
174 </connections>
175 </ui>

```

58.4 功能框架

58.4.1 主窗口

C:\Users\Minwei\Projects\Qt\Sheet\sheetwindow.h:

```

1  #ifndef SHEETWINDOW_H
2  #define SHEETWINDOW_H
3
4  #include <QMainWindow>
5  #include <QLabel>
6
7  QT_BEGIN_NAMESPACE
8  namespace Ui { class Sheetwindow; }
9  QT_END_NAMESPACE
10
11 class Sheetwindow : public QMainWindow
12 {
13     Q_OBJECT
14
15 public:
16     Sheetwindow(QWidget *parent = nullptr);
17     ~Sheetwindow();
18

```

```

19 private slots:
20     void on_m_actRowCol_triggered();
21     void on_m_actHeader_triggered();
22     void on_m_actCell_triggered();
23
24     void on_m_table_clicked(const QModelIndex &index);
25
26 private:
27     Ui::SheetWindow *ui;
28     QLabel* m_labCellPos;
29     QLabel* m_labCellText;
30 };
31
32 #endif // SHEETWINDOW_H

```

C:\Users\Minwei\Projects\Qt\Sheet\sheetwindow.cpp:

```

1  #include "sheetwindow.h"
2  #include "ui_sheetwindow.h"
3
4  SheetWindow::SheetWindow(QWidget *parent)
5      : QMainWindow(parent)
6      , ui(new Ui::SheetWindow)
7      , m_labCellPos(new QLabel("单元格位置: "))
8      , m_labCellText(new QLabel(" 单元格内容: "))
9  {
10     ui->setupUi(this);
11
12     setCentralWidget(ui->m_table);
13
14     m_labCellPos->setMinimumWidth(200);
15     ui->m_statusBar->addWidget(m_labCellPos);
16     m_labCellText->setMinimumWidth(200);
17     ui->m_statusBar->addWidget(m_labCellText);
18 }
19
20 SheetWindow::~SheetWindow()
21 {
22     delete ui;
23 }
24
25 void SheetWindow::on_m_actRowCol_triggered()
26 {
27 }
28
29 void SheetWindow::on_m_actHeader_triggered()
30 {
31 }
32
33 void SheetWindow::on_m_actCell_triggered()
34 {
35 }
36
37 void SheetWindow::on_m_table_clicked(const QModelIndex &index)
38 {

```

58.4.2 “行列”对话框

C:\Users\Minwei\Projects\Qt\Sheet\rowcoldialog.h:

```

1  #ifndef ROWCOLDIALOG_H
2  #define ROWCOLDIALOG_H
3
4  #include <QDialog>
5
6  namespace Ui {
7  class RowColDialog;
8  }
9
10 class RowColDialog : public QDialog
11 {
12     Q_OBJECT
13
14 public:
15     explicit RowColDialog(QWidget *parent = nullptr);
16     ~RowColDialog();
17
18 private:
19     Ui::RowColDialog *ui;
20 };
21
22 #endif // ROWCOLDIALOG_H

```

C:\Users\Minwei\Projects\Qt\Sheet\rowcoldialog.cpp:

```

1  #include "rowcoldialog.h"
2  #include "ui_rowcoldialog.h"
3
4  RowColDialog::RowColDialog(QWidget *parent) :
5      QDialog(parent),
6      ui(new Ui::RowColDialog)
7  {
8      ui->setupUi(this);
9  }
10
11 RowColDialog::~RowColDialog()
12 {
13     delete ui;
14 }

```

58.4.3 “表头”对话框

C:\Users\Minwei\Projects\Qt\Sheet\headerdialog.h:

```

1  #ifndef HEADERDIALOG_H
2  #define HEADERDIALOG_H
3
4  #include <QDialog>

```



```

5
6 namespace Ui {
7 class HeaderDialog;
8 }
9
10 class HeaderDialog : public QDialog
11 {
12     Q_OBJECT
13
14 public:
15     explicit HeaderDialog(QWidget *parent = nullptr);
16     ~HeaderDialog();
17
18 private:
19     Ui::HeaderDialog *ui;
20 };
21
22 #endif // HEADERDIALOG_H

```

C:\Users\Minwei\Projects\Qt\Sheet\headerdialog.cpp:

```

1 #include "headerdialog.h"
2 #include "ui_headerdialog.h"
3
4 HeaderDialog::HeaderDialog(QWidget *parent) :
5     QDialog(parent),
6     ui(new Ui::HeaderDialog)
7 {
8     ui->setupUi(this);
9 }
10
11 HeaderDialog::~HeaderDialog()
12 {
13     delete ui;
14 }

```

58.4.4 “单元”对话框

C:\Users\Minwei\Projects\Qt\Sheet\celldialog.h:

```

1 #ifndef CELLDIALOG_H
2 #define CELLDIALOG_H
3
4 #include <QDialog>
5
6 namespace Ui {
7 class CellDialog;
8 }
9
10 class CellDialog : public QDialog
11 {
12     Q_OBJECT
13
14 public:

```

```
15     explicit CellDialog(QWidget *parent = nullptr);
16     ~CellDialog();
17
18 private slots:
19     void on_m_btnUpdate_clicked();
20
21 private:
22     Ui::CellDialog *ui;
23 };
24
25 #endif // CELLDIALOG_H
```

C:\Users\Minwei\Projects\Qt\Sheet\celldialog.cpp:

```
1 #include "celldialog.h"
2 #include "ui_celldialog.h"
3
4 CellDialog::CellDialog(QWidget *parent) :
5     QDialog(parent),
6     ui(new Ui::CellDialog)
7 {
8     ui->setupUi(this);
9 }
10
11 CellDialog::~CellDialog()
12 {
13     delete ui;
14 }
15
16 void CellDialog::on_m_btnUpdate_clicked()
17 {
18 }
```

58.5 测试验证

运行效果如图所示:

