Developing a C++ Program to Solve a Second Order Equation Using Microsoft Visual C++ 6.0

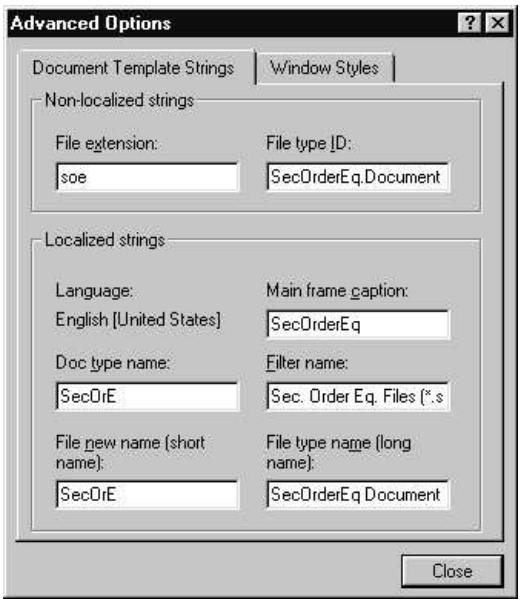
Alvaro F. M. Azevedo - http://www.fe.up.pt/~alvaro

March 2003

Start Microsoft Visual C++.

Create a new project of type MFC App Wizard (*.exe).

Select the following Advanced Options:



Accept the following class names:

- Document class - CSecOrderEqDoc
- View class - CSecOrderEqView

Insert new data members in the document class. These data members are needed to store the document data.

In this example the following data members must be inserted in the public attributes section of the file CSecOrderEqDoc.h:

```
// Equation: a x^2 + b x + c = 0
double m_fA; // a
double m_fB; // b
double m_fC; // c
```

Initialize these data members in the function CSecOrderEqDoc::OnNewDocument typing the following lines of code:

```
m_fA =  1.0;
m_fB =  2.0;
m_fC = -3.0;
```

Add the serialization code to the function CSecOrderEqDoc::Serialize:

```
if (ar.IsStoring())
{
	// TODO: add storing code here
	ar << m_fA << m_fB << m_fC;
}
else
{
	// TODO: add loading code here
	ar >> m_fA >> m_fB >> m_fC;
}
```

Add the graphical output code to the function CSecOrderEqView::OnDraw.

Now you may build SecOrderEq.exe (type F5).

To change the values of a, b and c, the following tasks must be performed:

- create a dialog box with 3 edit boxes and 2 buttons (OK and Cancel)
- create a new class derived from CDialog to manage the dialog box
- create a new entry in a pop up menu to open the dialog box
- write the function that is executed when the new menu entry is selected
- add to this function the code that copies the new values of a, b and c from the dialog box to the document instance (see more details below)

Do not forget to:

- change IDD_DIALOG1 to IDD_EDIT_DATA
- change the dialog box caption to Edit Data
- change IDC_EDIT1 to IDC_NEW_A, etc.
- change the tab order (Layout/Tab Order)
- the name of the new CDialog derived class may be CDialogEditData
- in the Class Wizard, select the tab whose title is Member Variables
- select IDC_NEW_A and click Add Variable...
- name the new variable m_fA and select Value/double, etc.

Select the application menu and add the Edit/Data entry.

Select this new entry and open the Class Wizard.

Perform the following tasks:

- in the Class Wizard, select the tab whose title is Message Maps
- in the Class name combo box select CSecOrderEqDoc
- in the Object IDs list box select ID_EDIT_DATA
- in the Messages list box select COMMAND
- click the button Add Function and accept the name OnEditData
- click the button Edit Code

- the new function called OnEditData belongs to the document class (CSecOrderEqDoc) and must perform the following tasks:
  - instantiate the class CDialogEditData - the name of the object may be dlgAux
  - copy the previous values of a, b and c to the data members of the dialog class
  - call the function DoModal
  - copy the new values of a, b and c to the data members of the document class
  - call SetModifiedFlag to indicate that the document has changed
  - call UpdateAllViews to redraw all the document views
- do not forget to include the header file that implements the dialog box class (DialogEditData.h)

Now you may rebuild SecOrderEq.exe (type F5).

With this new version you may now save and load documents with the File/Save and File/Open commands. The new values of a, b and c are stored in a binary file with .soe extension.

New enhancements:

- add an accelerator shortcut to the Edit/Data command (e.g., Ctrl+D). To do this open the accelerator editor, double click on the empty line and assign ID_EDIT_DATA to Ctrl+D
- add a new toolbar button to trigger the Edit/Data command. To do this open the toolbar editor, create a new button, double click on the thumbnail of the new button and assign the new button to ID_EDIT_DATA