Operations on Opening new document:

Define function KillAllTimers



```cpp
void CSingleView::KillAllTimers(void)
{
      CSingleDoc *pDoc = GetDocument();
      for (int i = 0; i < pDoc -> arrayBall.GetSize(); i++)
        KillTimer(i+1);
}
```

Modify `CSingleView::OnDestroy()`:
```cpp
void CSingleView::OnDestroy()
{
      CView::OnDestroy();

      // TODO: Add your message handler code here
      KillAllTimers();
}
```

Override `DeleteContents()` (called by `OnNewDocument()`,`OnOpenDocument()` and
at the end of the application):
```cpp
void CSingleDoc::DeleteContents()
{
      // TODO: Add your specialized code here and/or call the base
class
      POSITION pos = GetFirstViewPosition();
      CSingleView *pView = (CSingleView*) GetNextView(pos);
      // At the end of the program this method is called when View
class
      // is already destoroyed, check if it exists
      if (pView) pView->KillAllTimers();
```

```
        for (int i = 0; i < arrayBall.GetSize(); i++)
        {
                CBall* pBall = (CBall*) arrayBall[i];
                delete pBall;
        }

        arrayBall.RemoveAll();

        if (pView) pView->Invalidate();

        CDocument::DeleteContents();
}
```

Add #include "SingleView.h" in "SingleDoc.cpp"

Now we don't need memory deallocation in the Document destructor, modify destructor:
```
CSingleDoc::~CSingleDoc()
{
}
```

Serialization:

```
void CSingleDoc::Serialize(CArchive& ar)
{
        arrayBall.Serialize(ar);

        if (ar.IsStoring())
        {
                // TODO: add storing code here
        }
        else
        {
                // TODO: add loading code here
        }
}
```
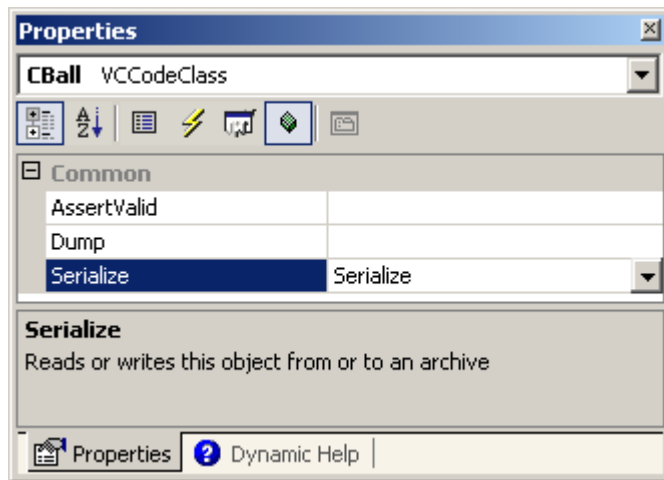
Into CBall declaration Add macro DECLARE_SERIAL(CBall), and into implementation – IMPLEMENT_SERIAL(CBall, CObject,1).
Override "Serialize" method":

```
void CBall::Serialize(CArchive& ar)
{
      CObject::Serialize(ar);

      if (ar.IsStoring())
      {     // storing code
            ar << Radius << CenterX << CenterY << DeltaX << DeltaY <<
Velocity;
      }
      else
      {     // loading code
            ar >> Radius >> CenterX >> CenterY >> DeltaX >> DeltaY >>
Velocity;
      }
}
```

IMPORTANT !!! For serializable class you have to provide constructor with no parameters.

Override "OnOpenDocument" method":

```
BOOL CSingleDoc::OnOpenDocument(LPCTSTR lpszPathName)
{
      if (!CDocument::OnOpenDocument(lpszPathName))
            return FALSE;

      // TODO:  Add your specialized creation code here
      POSITION pos = GetFirstViewPosition();
      CSingleView *pView = (CSingleView*) GetNextView(pos);

      for (int i = 0; i < arrayBall.GetSize(); i++)
      {
            CBall* pBall = (CBall*) arrayBall[i];
            pView->SetTimer(i+1, (int) 1000 / pBall->Velocity, NULL);
      }

      return TRUE;
}
```
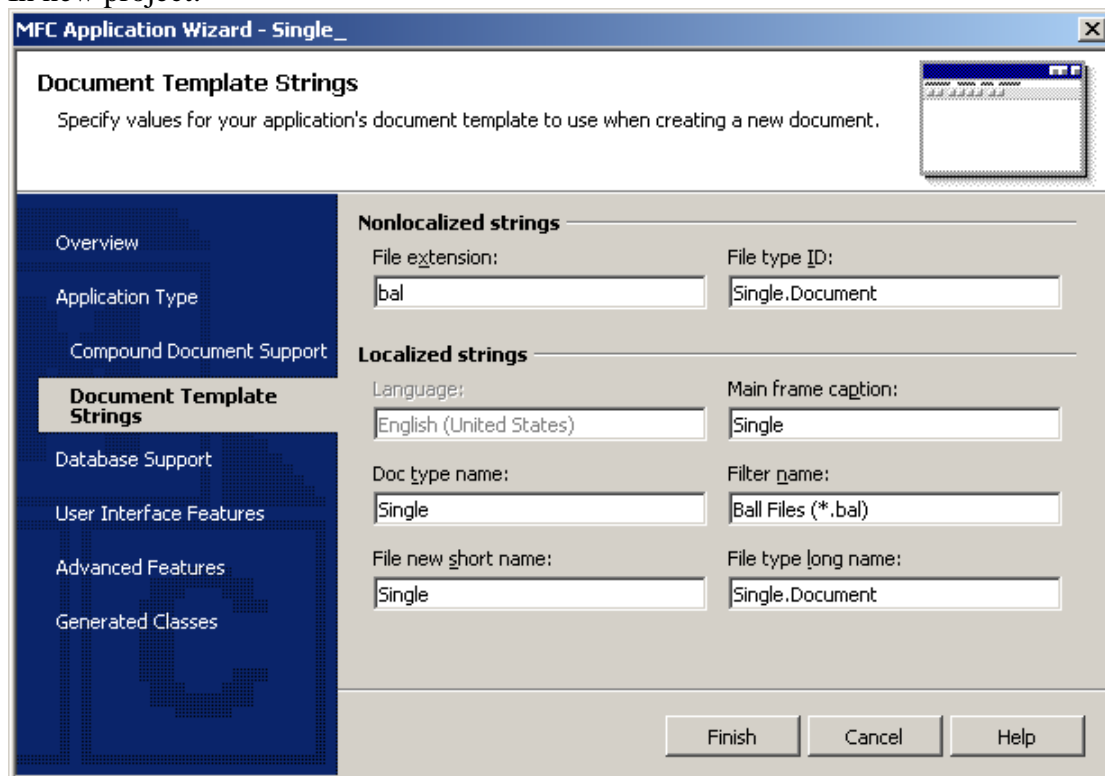
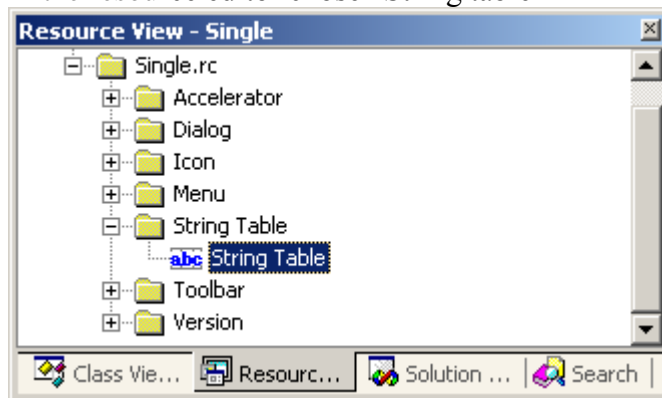Into CSingleView::OnLButtonDown() add call to pDoc->SetModifiedFlag().

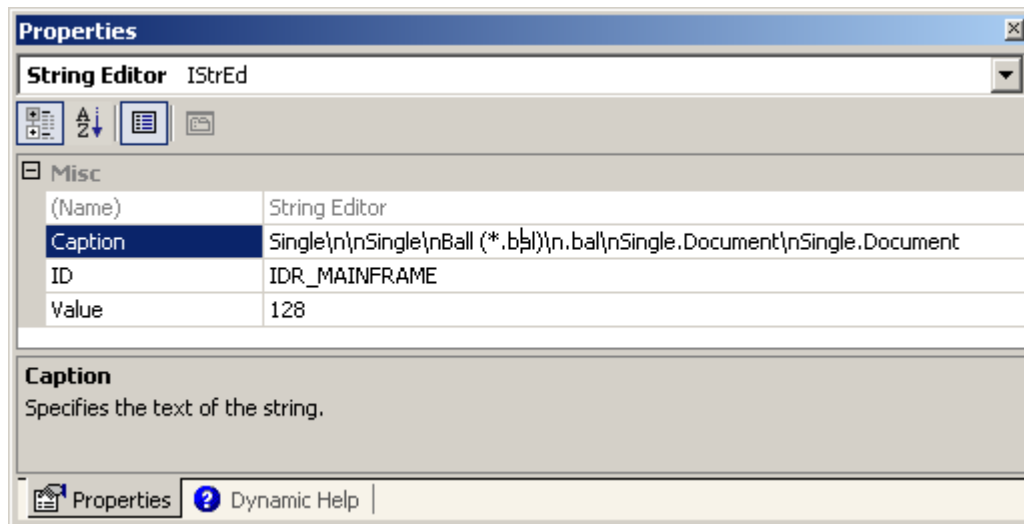Definition of "file name" filter:
In new project:



In an existing project:
In the resource editor chose "String table"



and modify "Caption":
after 3$^{rd}$ "\n" - Ball (*.bal); after 4$^{th}$ – ".bal"

In order to get the prompt "Save file?" when the document was changed, add

```
pDoc->SetModifiedFlag();
```

in "`OnLButtonDown`" and "`OnRButtonDown`".