
EXERCISE 1

Introduction to Form Builder

Form Builder v2.1

Action:

Widget:

Add Comments...

Parent

- ◆ Form
- ◆ Frame
- ◆ Option Menu
- ◆ Switch
- ◆ Select Frame
- ◆ List Box
- ◆ Scroll Frame

Widget X Location

◆ Col. 1 ◆ Col. 2 ◆ Col. 3

Type of Form:

Form Width:

Form Height:

Form X Location:

Form Y Location:

Form Label:

Form PCL Name:

Objective:

- In this exercise, you will create a PATRAN form using the Form Builder and then save it into a PCL file.

Model Description:

In this exercise you will create a PATRAN form using the Form Builder and then save it into a PCL file. Throughout this exercise you will become more familiar with the use of Form Builder which is a basic tool for creating a user interface for programs in MSC/PATRAN.

Exercise Procedure:

Copy library functions

1. Change your directory to `ex1` directory. Two files, `p3epilog.pcl` and `p3midilog.pcl` should reside in the `ex1` directory.

The files contain the following:

`p3epilog.pcl:`

```
!!library ~/solution_306/ex3/test.plb
fb_menu.init()
```

`fb_menu.init()` adds the Form Builder menu to the top menu bar.

`p3midilog:`

```
uil_main_form_parameters.reset_num_com_win_rows(15)
```

Move both files into your home directory.

2. Create a soft link called `outside.plb` by typing at the shell prompt:


```
In -s ~/solution_306/ex3/ex3e/outside.plb outside.plb
```
3. Start MSC/PATRAN by typing `p3` in your xterm window.
4. Create a new database and name it `exercise_1.db`.

File/New...

New Database Name:

exercise_1.db

OK

In the New Model Preference form set the following:

Tolerance:

◆ **Default**

Analysis Code:

MSC/NASTRAN

**The Form
Builder**

Analysis Type:

Structural

OK

5. Select **Form Builder** from the *Main Menu*. The form should appear as follows:

Form Builder v2.1

Action:

Widget:

Add Comments...

Parent

- ◆ Form ◇ Frame
- ◇ Option Menu ◇ Switch
- ◇ Select Frame ◇ List Box
- ◇ Scroll Frame

Widget X Location

◆ Col. 1 ◇ Col. 2 ◇ Col. 3

Type of Form:

Form Width:

Form Height:

Form X Location:

Form Y Location:

Form Label:

Form PCL Name:

Apply **Cancel**

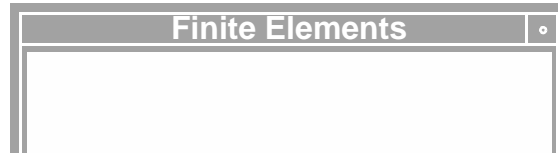
6. Click on the **Finite Elements** in the *main window*, this is the form that you are going to build.

7. Create the form itself. Set the following on the **Form Builder** to set the size, location and title of the form you are buildingg.

Create the form itself

Action:	<input type="text" value="Create"/>
Widget:	<input type="text" value="Form"/>
Form Width:	<input type="text" value="Narrow"/>
Form Height:	<input type="text" value="Tall"/>
Form X Location:	<input type="text" value="Flush Right"/>
Form Y Location:	<input type="text" value="Under Main Menu"/>
Form Label:	<input type="text" value="Finite Elements"/>
<input type="text" value="Apply"/>	

A form will appear on the screen as shown below.

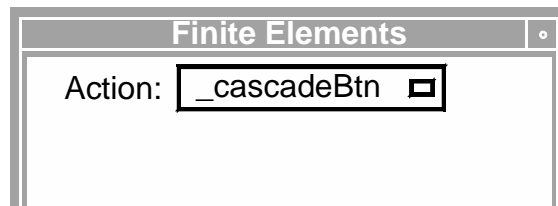


Create an Option Menu

8. Create an Option Menu on the form.

Widget:	<input type="text" value="Option Menu"/>
Parent	◆ Form
■ Label on Left	
Label Length:	<input type="text" value="0.7"/>
Label:	<input type="text" value="Action:"/>
<input type="button" value="Apply"/>	

The form should show the following:

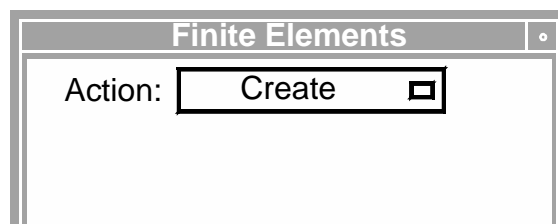


Notice that some arbitrary characters appear on the option menu bar; this is because we haven't created any items in the option menu (Note: this might look different on different platforms).

Create an Item for an Option Menu

Widget:	<input type="text" value="Item"/>
Parent	◆ Option Menu
Name:	<input type="text" value="Action_create"/>
Label:	<input type="text" value="Create"/>
<input type="button" value="Apply"/>	

After creating an item, the form should appear as follows:



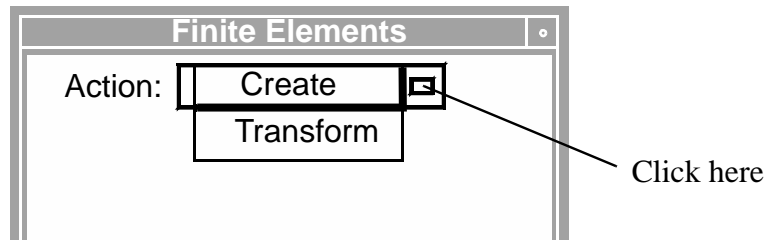
9. Next, create a second item in the option menu.

Name:

Label:

Create a Second Item for the Option Menu

Click and hold the button on the option menu and you will see the two items under the menu.

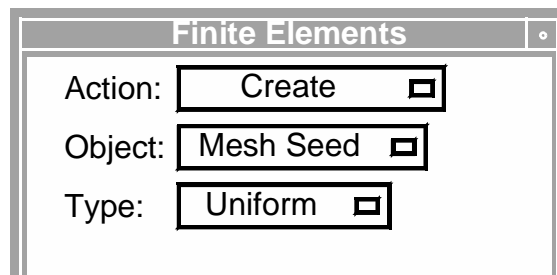


10. Now repeat the above procedure to build the option menu for **Object** and **Type**. Use the following name and labels.

Note: Be sure to select the appropriate option in the *Parent* listbox when creating each item.

	<u>Name</u>	<u>Label</u>
Object:	Create_Seed	Mesh Seed
Type:	Create_Seed_Uniform	Uniform

Your form should appear as shown below.

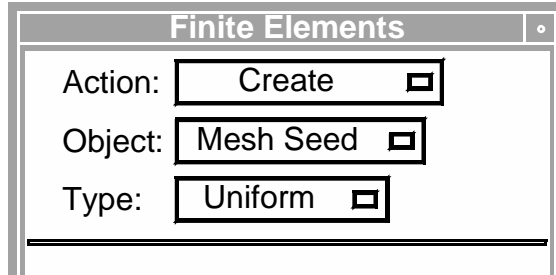


11. Create a Separator on the form.

Widget:

Create a separator

You will see a separator below the last option menu.

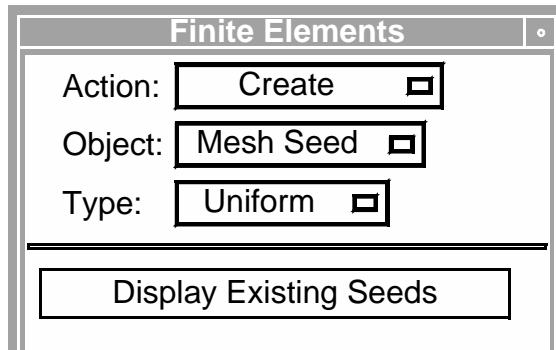


12. Create a button on the form.

Create a button

Widget:	<input type="text" value="Button"/>
Width:	<input type="text" value="Full Column"/>
Location in Column:	<input type="text" value="Left Side"/>
Label:	<input type="text" value="Display Existing Seeds"/>
<input type="button" value="Apply"/>	

A button will appear on your form as shown.



13. Create a frame on the form.

Create a frame

Widget:	<input type="text" value="Frame"/>
Label:	<input type="text" value="Element Edge Length Data"/>
<input type="button" value="Apply"/>	

Create an Labelicon in the frame.

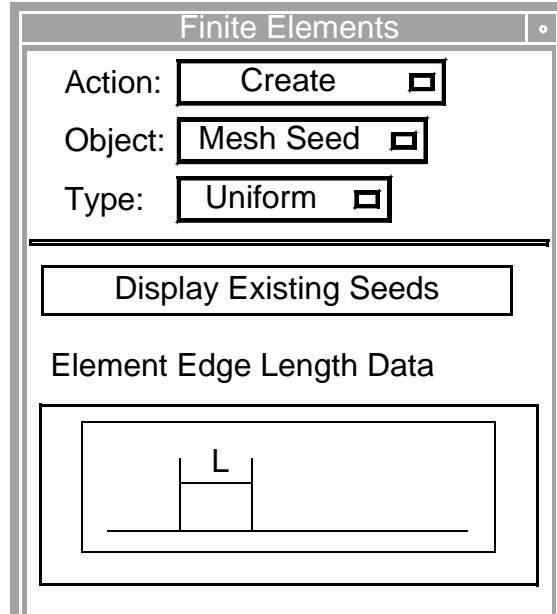
Create a Labelicon

Widget:	<input type="text" value="Labelicon"/>
Parent	◆ <input type="text" value="Frame"/>

Enter the following in the *Icon Name* databox:

/patran/patran3/icons/fem_mesh_uniform_edge.icon

This will transfer the graphic of the labelicon from the PATRAN icon library to the form. An icon will then appear in your form as follows:



14. Create a Switch in the frame.

Widget:

Parent:

Always One

Create a Switch

After pressing **Apply**, you will see that some space has been added on the form but no switch appears. It is because we need to assign an item to the switch.

Widget:

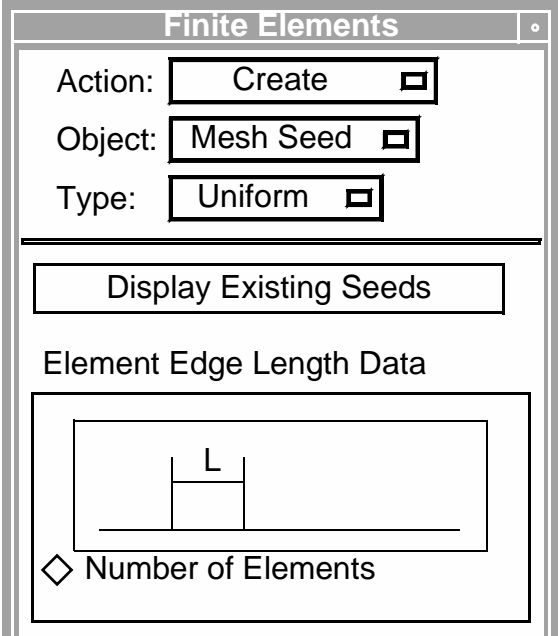
Parent:

Name:

Label:

Assign an Item to a Switch

Your form will appear as follows:



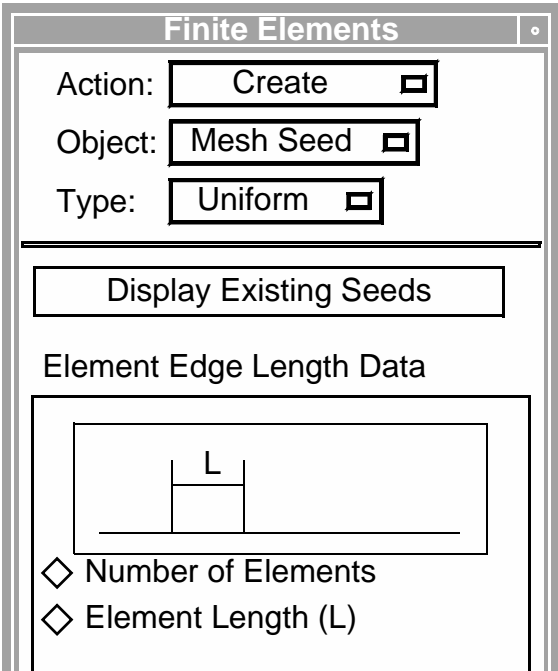
**Create a
Second Item
for the
Switch**

Next, we would like to create a second item for the switch.

Name:

Label:

A second item will appear in the frame as shown below.



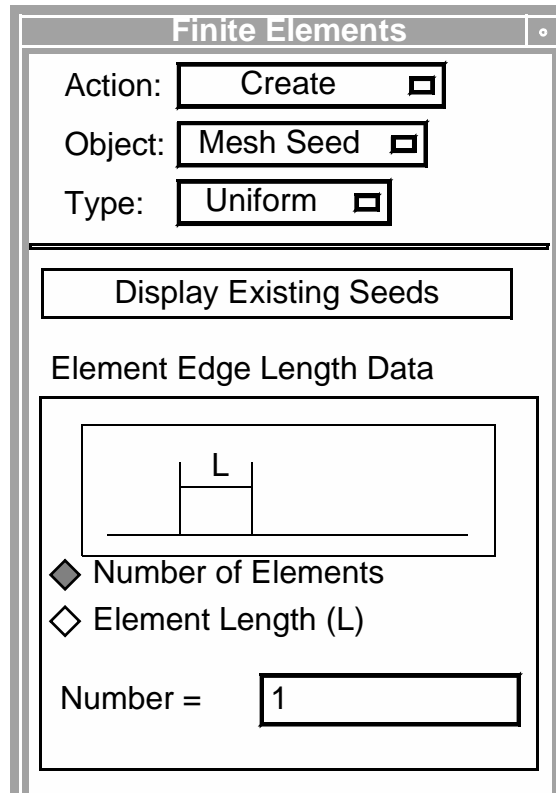
Try to click on both items. Notice that only one button can be picked each time. This is because we selected the *Always One* option.

15. Create a databox in the frame.

Widget:	<input type="text" value="Databox"/>
Parent	◆ Frame
■ Label on Left	
Label Length:	<input type="text" value="1.2"/>
Label:	<input type="text" value="Number ="/>
<input type="button" value="Apply"/>	

Create a Databox

A databox will then be created as shown below.



16. Create a Select Frame on the form.

Widget:	<input type="text" value="Select Frame"/>
Parent	◆ Form

Create a Select Frame

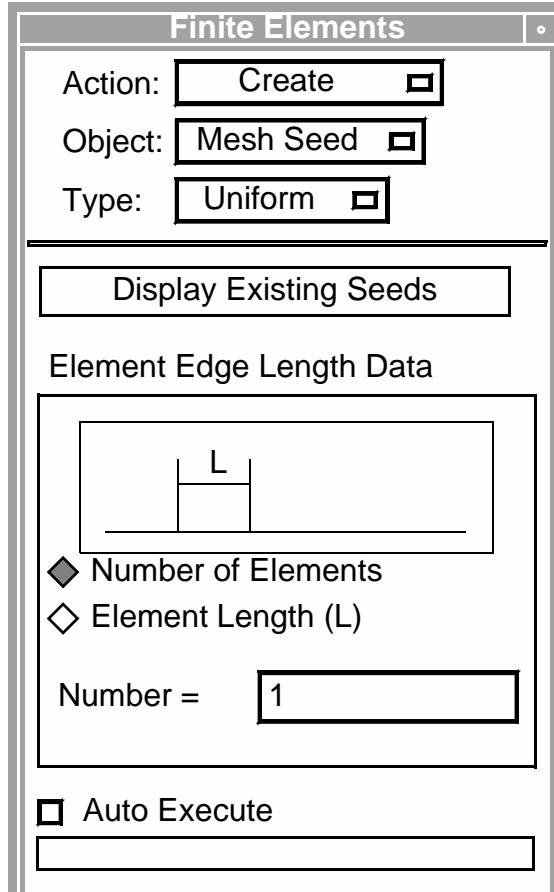
■ **Toggle**

ToggleLabel:

Auto Execute

Apply

A select frame will appear as shown below.



17. Create a Select Databox in the Select Frame.

Create a Select Databox

Widget:

Select Databox

Parent

◆ **Select Frame**

Label on Left

Label:

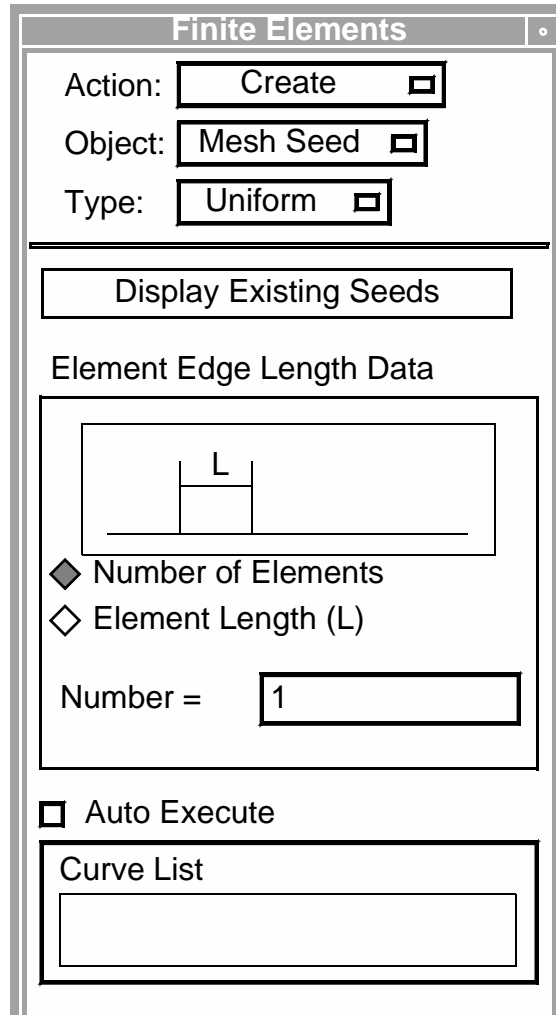
Curve List

Data Type

Curve_Edge

Apply

The select databox will appear as shown below.



18. Create another Separator on the form.

Widget:

Create another Separator

19. Create the **Apply** button on the form.

Widget:

Parent: Form

Width:

Location in Column:

Create the Apply Button

21. Test the PCL file.

At the shell prompt, type

```
/usr/lib/cpp -I/patran/patran3/customization exercise_1.pcl exercise_1.cpp
```

(For Sun Solaris machines the command is `%/usr/ccs/lib/cpp -I/etc. ...`)

(For HP-UX v. 10.2 or later: `%/usr/ccs/lbin/cpp -I/etc...`)

Type the following line in the command window of MSC/PATRAN:

```
!!input exercise_1.cpp
```

then type

```
ui_exec_function ("testing","display")
```

Now the form you just created should appear on the screen again.

Close the database.

File/Close

22. Read in the PCL file.

Generally, we cannot vary the datatype of a particular variable in a function argument list in PCL. However, `ui_databox_create` is a special function which allows this in PATRAN but cannot be duplicated in our external function. Using vi editor, edit `exercise_1.pcl` file. Go to line 177 and change the value for `value` from integer 1 to sting "".

Reopen the database and bring up **Form Builder**.

File/Open...

Existing Database Name:

exercise_1.db

OK

Form Builder/Form Builder...

Action:

Read PCL

File Name:

exercise_1.pcl

Apply

The form that was created earlier should show up on screen.

Test the PCL file

Read in the PCL file

Quit MSC/PATRAN to end this exercise.

File/Quit

The PCL File Listing

File Listing for exercise_1.pcl:

```
#include "appforms.p"

CLASS ex

/* Classwide Variables */
    CLASSWISE WIDGET form_id, optmenu_01, optmenu_02,
    optmenu_03, item_01

    CLASSWISE WIDGET item_02, item_03, item_04, sep_01,
    button_01, frame_01

    CLASSWISE WIDGET labicon_01, switch_01, item_05,
    switch_02, item_06

    CLASSWISE WIDGET datbox_01, selfrm_01, seldbox_01,
    sep_02, button_02

FUNCTION init()
    REAL box_length=0.0
    REAL yloc_main
    REAL yloc_frame_01=0., yloc_selfrm_01=0.

    form_id=ui_form_create(
/* callback */      "",
/* x */             FORM_X_LOC_SML_CEN,
/* y */             FORM_Y_LOC,
/* position */     "UL",
/* width */        FORM_WID_SML,
/* height */       FORM_HGT_TALL,
/* label */        "Finite Elements",
/* unused */       "")

    yloc_main = FORM_T_MARGIN

    optmenu_01=ui_optionmenu_create(
/* parent */       form_id,
/* callback */     "",
/* x */            FORM_L_MARGIN,
/* y */            yloc_main,
/* label_length */ 1.,
/* label */        "Action",
```

```
/* label_above */      FALSE)

yloc_main += OPT_MENU_HGT_NO_LABOVE + @
               INTER_WIDGET_SPACE

item_01=ui_item_create(      @
/* parent */          optmenu_01,@
/* name */           "CREATE", @
/* label */          "Create", @
/* toggleable */     TRUE)

item_02=ui_item_create(      @
/* parent */          optmenu_01,@
/* name */           "Mesh Seed", @
/* label */          "Mesh Seed", @
/* toggleable */     TRUE)

optmenu_02=ui_optionmenu_create(  @
/* parent */         form_id,    @
/* callback */       "",        @
/* x */             FORM_L_MARGIN,@
/* y */             yloc_main,  @
/* label_length */  1.,         @
/* label */         "Object",   @
/* label_above */   FALSE)

yloc_main += OPT_MENU_HGT_NO_LABOVE + @
               INTER_WIDGET_SPACE

item_03=ui_item_create(      @
/* parent */          optmenu_02, @
/* name */           "Mesh Seed", @
/* label */          "Mesh Seed", @
/* toggleable */     TRUE)

optmenu_03=ui_optionmenu_create(  @
/* parent */         form_id,    @
/* callback */       "",        @
/* x */             FORM_L_MARGIN,@
/* y */             yloc_main,  @
/* label_length */  1.,         @
/* label */         "Type",     @
/* label_above */   FALSE)
```

```

yloc_main += OPT_MENU_HGT_NO_LABOVE + @
                INTER_WIDGET_SPACE

item_04=ui_item_create(                @
/*  parent */          optmenu_03, @
/*  name   */          "Uniform", @
/*  label  */          "Uniform", @
/* toggleable */      TRUE)

sep_01=ui_separator_create(           @
/*  parent */          form_id, @
/*  name   */          "", @
/*  x      */          0.0, @
/*  y      */          yloc_main, @
/*  length */          FORM_WID_SML,@
/* horizontal */      TRUE)

yloc_main += 5*PIXEL_HGT                - @
                0.5*INTER_WIDGET_SPACE + @
                INTER_WIDGET_SPACE

button_01=ui_button_create(           @
/*  parent */          form_id, @
/*  callback */        "", @
/*  x      */          BUTTON_FULL_X_LOC1, @
/*  y      */          yloc_main, @
/*  width  */          BUTTON_WID_FULL, @
/*  height */          BUTTON_DEFAULT_HGT, @
/*  label  */          "Display Existing Seeds",@
/*  TRUE   */          TRUE, @
/*  highlight */      FALSE)

yloc_main += BUTTON_DEFAULT_HGT + @
                INTER_WIDGET_SPACE

frame_01=ui_frame_create(             @
/* parent */          form_id, @
/* name   */          "", @
/*  x      */          FRAME_X_LOC_COL1, @
/*  y      */          yloc_main, @
/* width  */          FRAME_WID_SINGLE, @
/* height */          1.0, @
/* label  */          "Element Edge Length Data")

yloc_frame_01 = FRAME_T_MARGIN

```

```

labicon_01=ui_labelicon_create(      @
/* parent */      frame_01,      @
/* callback */      "",      @
/* x */      FORM_L_MARGIN, @
/* y */      yloc_frame_01, @
/* iconname */      "happy")

yloc_frame_01 += 200*PIXEL_HGT      + @
                INTER_WIDGET_SPACE

switch_01=ui_switch_create(      @
/* parent */      frame_01,      @
/* callback */      "",      @
/* x */      FORM_L_MARGIN, @
/* y */      yloc_frame_01, @
/* num_cols */      1,      @
/* label */      "",      @
/* always_one */      FALSE)

yloc_frame_01 += SWITCH_2R_HGT_NO_LABEL + @
                INTER_WIDGET_SPACE

item_05=ui_item_create(      @
/* parent */      switch_01,      @
/* name */      "NOE",      @
/* label */      "Number of Elements",@
/* toggleable */      TRUE)

item_06=ui_item_create(      @
/* parent */      switch_01,      @
/* name */      "EL",      @
/* label */      "Element Length (L)",@
/* toggleable */      TRUE)

ui_wid_set(frame_01,"HEIGHT",yloc_frame_01)

yloc_main += FRAME_2EDGE      + @
            INTER_WIDGET_SPACE + @
            yloc_frame_01

switch_02=ui_switch_create(      @
/* parent */      frame_01,      @

```

```

/* callback */      "",      @
/*      x      */      FORM_L_MARGIN,  @
/*      y      */      yloc_frame_01,  @
/* num_cols */      1,      @
/* label */      "",      @
/* always_one */      TRUE)

yloc_frame_01 += SWITCH_1R_HGT_NO_LABEL + @
                INTER_WIDGET_SPACE

box_length = DBOX_WID_SINGLE - @
            1.5

datbox_01=ui_databox_create(      @
/* parent */      frame_01,      @
/* callback */      "",      @
/*      x      */      FORM_L_MARGIN,  @
/*      y      */      yloc_frame_01,  @
/* label_length */      1.5,      @
/* box_length */      box_length,      @
/* label */      "Number =",      @
/* value */      1,      @
/* label_above */      FALSE,      @
/* datatype */      "INTEGER",      @
/* num_vals */      1)

yloc_frame_01 += DBOX_HGT_NO_LABOVE + @
                INTER_WIDGET_SPACE

ui_wid_set(frame_01,"HEIGHT",yloc_frame_01)

yloc_main += FRAME_2EDGE      + @
            INTER_WIDGET_SPACE + @
            yloc_frame_01

selfrm_01=ui_selectframe_create(      @
/* parent */      form_id,      @
/* callback */      "",      @
/*      x      */      FORM_L_MARGIN,  @
/*      y      */      yloc_main,      @
/* width */      SFRAME_WID_SINGLE,  @
/* height */      1.0,      @
/* label */      "Auto Execute",      @
/* recycle */      FALSE)

yloc_selfrm_01 = SFRAME_T_MARGIN

```

```

seldbox_01=ui_selectdatabox_create(          @
/*  parent  */          selfrm_01,          @
/*  callback */          "",              @
/*    x    */          FORM_L_MARGIN,      @
/*    y    */          yloc_selfrm_01,     @
/* label_length */      0.0,              @
/* box_length */      SDBOX_WID_SINGLE,   @
/*  label   */          "Curve List",      @
/*  value   */          "",              @
/* label_above */      TRUE,              @
/* datatype */          "CURVE_EDGE",     @
/*  prompt  */          "")

yloc_selfrm_01 += SDBOX_HGT_LABOVE      + @
                INTER_WIDGET_SPACE

ui_wid_set(selfrm_01,"HEIGHT",yloc_selfrm_01)

yloc_main += SFRAME_2EDGE                + @
             INTER_WIDGET_SPACE          + @
             yloc_selfrm_01

sep_02=ui_separator_create(              @
/*  parent  */          form_id,          @
/*  name    */          "",              @
/*    x    */          0.0,              @
/*    y    */          yloc_main,        @
/* length  */          FORM_WID_SML,     @
/* horizontal */          TRUE)

yloc_main += 5*PIXEL_HGT                  - @
             0.5*INTER_WIDGET_SPACE      + @
             INTER_WIDGET_SPACE

button_02=ui_button_create(              @
/*  parent  */          form_id,          @
/* callback */          "",              @
/*    x    */          BUTTON_FULL_X_LOC1, @
/*    y    */          yloc_main,        @
/* width   */          BUTTON_WID_FULL,  @
/* height  */          BUTTON_DEFAULT_HGT, @
/* label   */          "-Apply-",        @

```

```
      /* TRUE */          TRUE,          @
      /* highlight */    FALSE)

      yloc_main += BUTTON_DEFAULT_HGT + @
                  INTER_WIDGET_SPACE

END FUNCTION /* init */

FUNCTION display()
  ui_form_display("ex")
END FUNCTION /* display */

END CLASS /* ex */
```