CS 535 Object-Oriented Programming & Design
Fall Semester, 2001
Doc 18 Dialogs
Contents

Reference & Reading

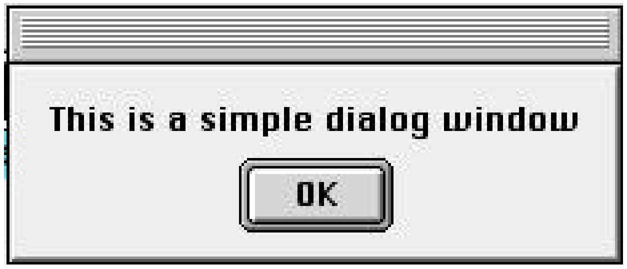
VisualWorks ***GUI Developer's Guide*** (GUIDevGuide.pdf) Chapter 7

Dialogs

This tutorial assume you have gone through the tutorial Simple GUI Tutorial or already familiar with the UIPainter.

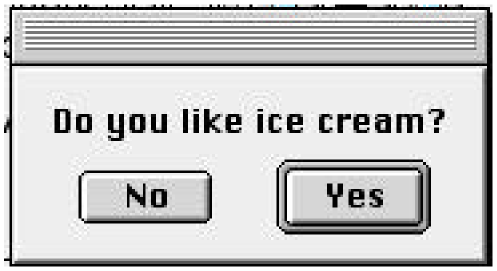
Standard Dialogs

VisualWorks comes with a number of standard dialogs. We will cover a few of them.



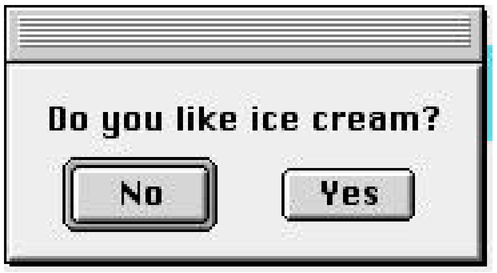
```
Dialog warn: 'This is a simple dialog window'.
```

Like all dialogs, the code returns only when the user closes the dialog.



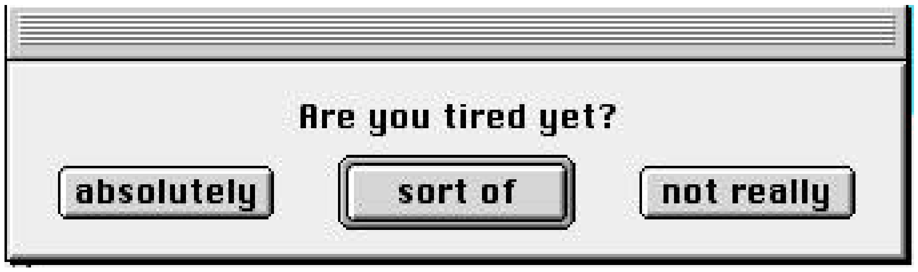
```
| answer |
answer := Dialog confirm: 'Do you like ice cream?'.
```

This dialog returns either true or false, depending on the user's response.



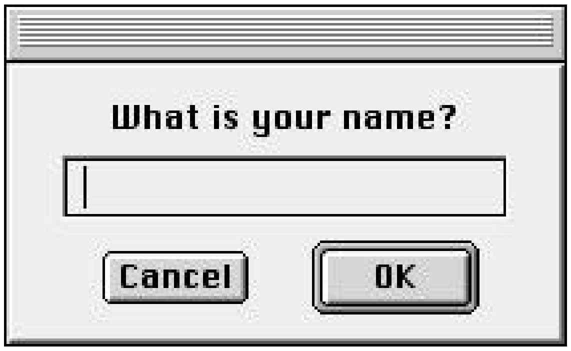
```
Dialog
    confirm: 'Do you like ice cream?'
    initialAnswer: false
```

This example shows how you can set the initially selected answer.



```
Dialog
    choose: 'Are you tired yet?'
    labels: #( 'absolutely'  'sort of'  'not really')
    values: #(#yes #maybe #no)
    default: #maybe
```

This example shows how to provide multiple options and specify the return values for each option displayed.

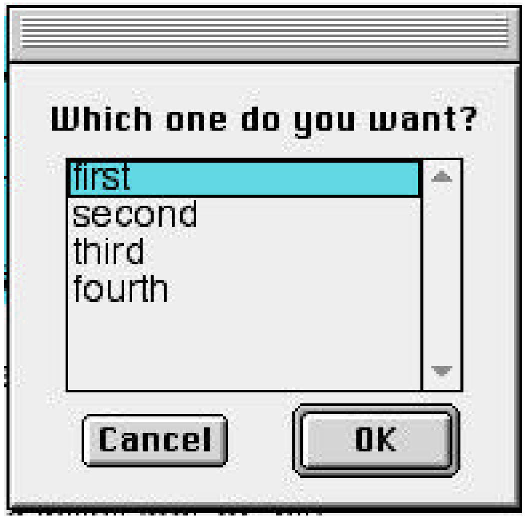


```
| answer |
answer := Dialog request: 'What is your name?'
```

Returns the text the user enters. If the user cancels the empty string '' is returned.
The variants below show how to set an initial answer and how to provide a different answer when the user cancels the dialog.

```
Dialog
    request: 'What is your name?'
    initialAnswer: 'Smith'

Dialog
    request: 'What is your name?'
    initialAnswer: 'Smith'
    onCancel: ['Jones']
```



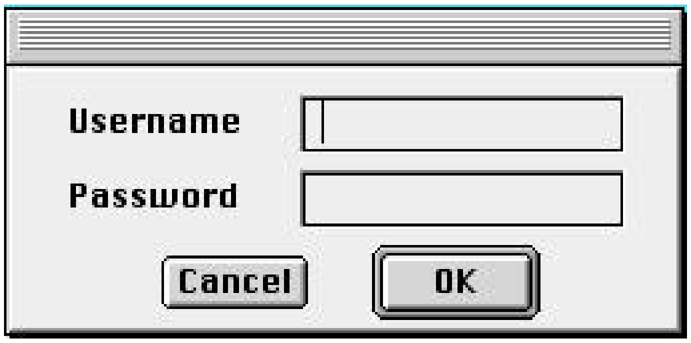
```
Dialog
    choose: 'Which one do you want?'
    fromList: #('first' 'second' 'third' 'fourth')
    values: #(1 2 3 4)
    lines: 8
    cancel: [#noChoice]
```

This example shows how to provide the user with a list of options. Both fromList: and values: keywords need a SequenceableCollection or subclass as an argument. The fromList: argument is the text to be displayed on the screen. The values: argument contains the value returned when the user selects an item. When the user selects the K'th item in the list, the K'th element of the values: argument is returned. The lines: keyword sets the maximum number of items that will fit in the window before the user has to scroll. The cancel: keyword requires a block as an argument. When the user cancels the dialog, the result of running the block is returned. While the block given here just returns a value, it could do more useful things like close files.

Making New Dialogs

There are times when one needs more complex dialogs. One can make new dialogs by using code or by using the UIPainter.

New Dialog via Code

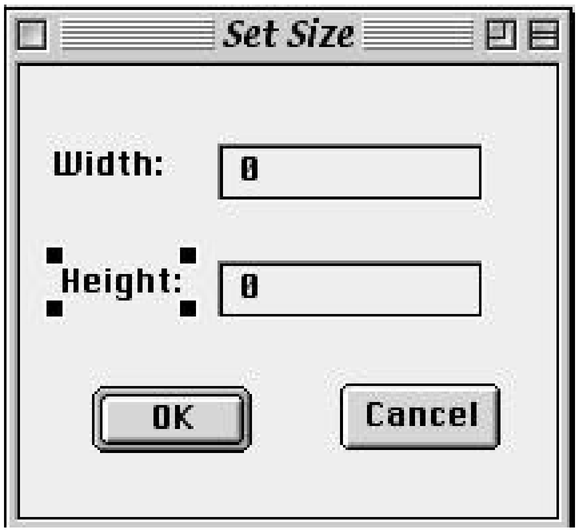


```
| user pass dialog |
user := '' asValue.
dialog := (SimpleDialog initializedFor: nil)
    setInitialGap.
dialog
    addMessage: 'Username'
    textLine:  user
    boundary: 0.4.
dialog addGap.
dialog
    addMessage: 'Password'
    textLine: (pass := '' asValue)
    type: #password
    boundary: 0.4.
dialog
    addGap;
    addOK: [true];
    openDialog.
user value -> pass value
```

The program above generates the dialog shown. The textLine: keyword requires a model. When the user enters text and clicks on the "OK" button, the model gets the value the user entered. '' asValue returns a ValueHolder on a string. ValueHolders are subclasses of Model. The statement "user value -> pass value" gets the values from the ValueHolders and creates an association from them. This is done here just to show that the values have been changed.

Dialog with UIPainter

In this section we will make a dialog that looks like:



This dialog will be used in an application to change the size of a region widget.

Creating a SimpleDialog Subclass

The straightforward way to create such a dialog is to create a new application. Open a new UIPainter. Add two input fields, two labels and two action buttons to make the canvas look like the image above. The properties of each item are given below.

Labels: One has Label string: "Height:" the other has label string: "Width:".

One field has aspect: #width, type: Number and format: 0

The other field has aspect: #height, type: Number and format: 0.

One action button has Label string 'OK', action: #accept, and is default.
The other button has label string: 'Cancel' and action: #cancel.
The window has label string: 'Set Size'.

Once this is done you need to install the window in a class. Click on the "Install…" button in the Canvas Tool. Create a new class. Call the class SizeDialog, put the class in the Examples namespace, and make the class a subclass of UI.SimpleDialog. You can use the Canvas Tool to define the aspects for the two input fields. Do this by selecting an input field and clicking on the "Define…" button in the Canvas Tool.

Now to make the dialog a bit easier to use, add the class method initialWidth:height: and the instance methods open and setWidth:height:. Here is the source code for the class. I edited height and width to save space. I also do not show all of the windowSpec method to save space.

```
Smalltalk.Examples defineClass: #SizeDialog
    superclass: #{UI.SimpleDialog}
    indexedType: #none
    private: false
    instanceVariableNames: 'width height '
    classInstanceVariableNames: ''
    imports: ''
    category: 'UIApplications-New'
```

Class methods

```
windowSpec
    "UIPainter new openOnClass: self andSelector: #windowSpec"

    <resource: #canvas>
    ^#(#{UI.FullSpec}
        rest of the spec removed to save space.

initialWidth: anInteger height: heigthInteger
    ^super new
        setWidth: anInteger
        height: heigthInteger
```

Instance Methods

```
height
    ^height

width
    ^width

open
    self openInterface: #windowSpec

setWidth: anInteger height: heightInteger
    width := anInteger asValue.
    height := heightInteger asValue.
```

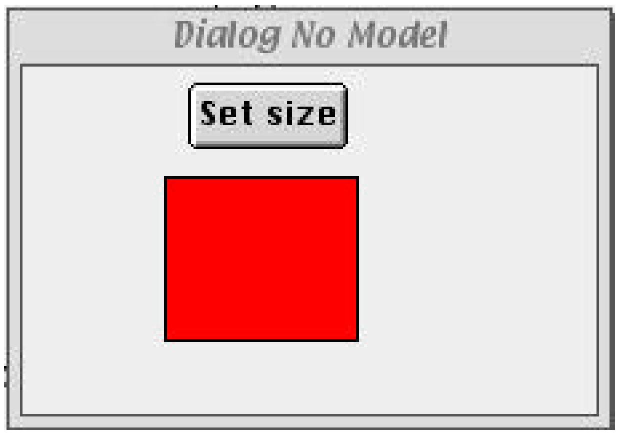
Now to use the dialog. The following code will open the dialog. The "dialog open" method opens the dialog and waits until the user closes the dialog. If the user cancels the dialog the method returns false, otherwise it returns true. It should not be hard to use this in an application.

```
| clickedOK dialog |
    dialog := SizeDialog initialWidth: 20 height: 50.
    clickedOK :=dialog open.
```

No new Model

The previous way of creating a dialog works fine. In this section we will explore creating dialogs without creating a new class. This is a bit more complex. It does introduce BufferedValueHolders and PluggableAdaptors, which are very useful.

The first step is to create our application. It will display a region widget and an action button. Here is what my window looks like:



Using the UIPainter create a window with an action button and a region widget. Give the region widget the ID: #shape. Give the button the label string "Set size" and the Action: #changeSize. Install the window in a class called "DialogNoModel" in the Examples namespace. Now to edit the DialogNoModel class. First add two instance variables: width and height. So the definition of the class looks like:

```
Smalltalk.Examples defineClass: #DialogNoModel
    superclass: #{UI.ApplicationModel}
    indexedType: #none
    private: false
    instanceVariableNames: 'width height '
    classInstanceVariableNames: ''
    imports: ''
    category: 'UIApplications-New'
```

Add the following methods:

```
initialize
    height := 100 asValue.
    width := 100 asValue.

changeSize
    self updateSize.
```

```
updateSize
    | shape oldSize newSize |
    shape := self builder componentAt: #shape.
    oldSize := shape bounds.
    newSize := Rectangle
        origin: oldSize origin
        width: width value
        height: height value.
    shape newBounds: newSize.
```

The last method changes the size of the region widget. Now to add the dialog. If you did the previous example you can just copy the SizeDialog class>>windowSpec method to DialogNoModel class>>sizeDialog. If you did not create SizeDialog class>>windowSpec do the following.

Open a new UIPainter. Add two input fields, two labels and two action buttons to make the canvas look like the image below. The properties of each item are given below.

Labels: One has Label string: "Height:" the other has label string: "Width:".

One field has aspect: #width, type: Number. and format: 0

The other field has aspect: #height, type: Number and format: 0.

One action button has Label string: 'OK', action: #accept, and is default.
The other button has label string: 'Cancel' and action: #cancel.
The window has label string: 'Set Size'.

Once this is done you need to install the window in the DialogNoModel class. Install it in the class with the selector named: **sizeDialog**. Do not install it in the method windowSpec.

Now to create the methods needed by the input fields. Select an input field in the canvas then click on the "Define..." button in the GUI Painter tool. Click OK on the first dialog that appears. Do the same for the other input field. There is no need to define the actions for the action buttons. The dialog will handle this. To make the dialog work we need to change the changeSize method to the following.

```
changeSize
    | clickedOK |
    clickedOK := self openDialogInterface: #sizeDialog.
    clickedOK ifFalse:[^nil].
    self    updateSize.
```

Now run the example. When you click on the "Set size" button, the dialog will appear. Here is the entire source code for the class (minus the interface specs) in case you have problems.

```
Smalltalk.Examples defineClass: #DialogNoModel
    superclass: #{UI.ApplicationModel}
    indexedType: #none
    private: false
    instanceVariableNames: 'width height '
    classInstanceVariableNames: ''
    imports: ''
    category: 'UIApplications-New'


initialize
    height := 100 asValue.
    width := 100 asValue.

updateSize
    | shape oldSize newSize |
    shape := self builder componentAt: #shape.
    oldSize := shape bounds.
    newSize := Rectangle
        origin: oldSize origin
        width: width value
        height: height value.
    shape newBounds: newSize.

changeSize
    | clickedOK |
    clickedOK := self openDialogInterface: #sizeDialog.
    clickedOK ifFalse:[^nil].
    self    updateSize.

height
    ^height isNil
        ifTrue:
            [height := 0 asValue]
        ifFalse:
            [height]

width
    ^width isNil
        ifTrue:
            [width := 0 asValue]
        ifFalse:
            [width]
```

Problem with displayed values

There is a problem with what we have done so far. When a dialog is opened, the values for width and height shown do not correspond with the actual values. This can happen in two ways. The first time a dialog is opened, the values will be 100. This is easy to fix. The other time this happens is a bit more subtle. Open the dialog window, change the values in the input fields, and then cancel the operation. Now open the dialog window again. The values you canceled are shown! What happened? When you typed in the new values in the input field, the height and width ValueHolder objects were updated. When you canceled the dialog, the application did not change the size of the region widget. One way to solve this is to have the changeSize method reset the values of width and height when the user cancels the dialog. VW has a more interesting way to solve this problem: use BufferedValueHolders. A BufferedValueHolder does not update ValueHolders until given the correct trigger. Here is the class redone using BufferedValueHolders. Note in changeSize when the user accepts the change we do "sizeTrigger value: true". Setting the trigger to true, tells the BufferedValueHolders to update their ValueModels.

```
Smalltalk.Examples defineClass: #DialogNoModel
    superclass: #{UI.ApplicationModel}
    indexedType: #none
    private: false
    instanceVariableNames: 'width height sizeTrigger '
    classInstanceVariableNames: ''
    imports: ''
    category: 'UIApplications-New'

initialize
    height := 100 asValue.
    width := 100 asValue.
    sizeTrigger := false asValue.

height
    ^BufferedValueHolder
        subject: height
        triggerChannel: sizeTrigger

width
    ^BufferedValueHolder
        subject: width
        triggerChannel: sizeTrigger

changeSize
    | clickedOK |
    clickedOK := self openDialogInterface: #sizeDialog.
    clickedOK ifFalse:[^nil].
    sizeTrigger value: true.
    self updateSize.
```

```
updateSize
    | shape oldSize newSize |
    shape := self builder componentAt: #shape.
    oldSize := shape bounds.
    newSize := Rectangle
        origin: oldSize origin
        width: width value
        height: height value.
    shape newBounds: newSize.
```

Using PluggableAdaptor

We may have eliminated the symptom, but we still have the cause. We have two copies of width and height. One copy in the region widget and one copy in instance variables of DialogNoModel class. We did this because the input fields of the dialog require value holders and the region widget can not use value holders. We can change this by using PluggableAdaptors. We will create PluggableAdaptors on the region widget to act like ValueHolders on the width and height of the region. Changes made in the dialog are sent directly to the region, but only when the BufferedValueHolders are triggered. The changeSize method now does not have to know how to update values. It just fires the trigger and tell the window to redraw itself.

```
Smalltalk.Examples defineClass: #DialogNoModel
    superclass: #{UI.ApplicationModel}
    indexedType: #none
    private: false
    instanceVariableNames: 'sizeTrigger '
    classInstanceVariableNames: ''
    imports: ''
    category: 'UIApplications-New'

initialize
    sizeTrigger := false asValue.

changeSize
    | clickedOK |
    clickedOK := self openDialogInterface: #sizeDialog.
    clickedOK ifFalse:[^nil].
    sizeTrigger value: true.
    self builder window display.
```

```
height
    | adaptor |
    adaptor := PluggableAdaptor on: (self builder componentAt: #shape).
    adaptor
        getBlock: [:model | model bounds height]
        putBlock:
            [:model :value | |  size |
            size := model bounds.
            size height: value.
            model bounds: size]
        updateBlock: [:model :aspect :parameter | aspect == #height].

    ^BufferedValueHolder
        subject: adaptor
        triggerChannel: sizeTrigger

width
    | adaptor |
    adaptor := PluggableAdaptor on: (self builder componentAt: #shape).
    adaptor
        getBlock: [:model | model bounds width]
        putBlock:
            [:model :value | |  size |
            size := model bounds.
            size width: value.
            model bounds: size]
        updateBlock: [:model :aspect :parameter | aspect == #width].

    ^BufferedValueHolder
        subject: adaptor
        triggerChannel: sizeTrigger
```