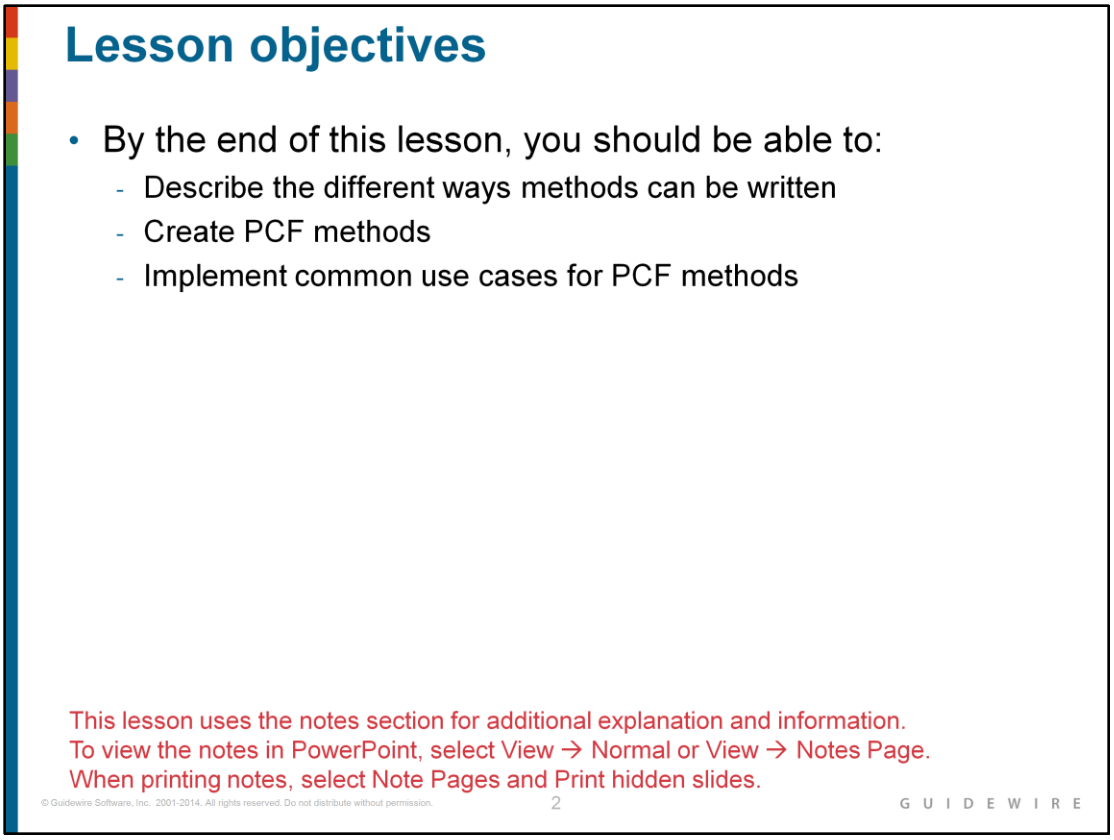
# PCF Methods

April 23, 2014



## Lesson objectives

- By the end of this lesson, you should be able to:
  - Describe the different ways methods can be written
  - Create PCF methods
  - Implement common use cases for PCF methods

This lesson uses the notes section for additional explanation and information.
To view the notes in PowerPoint, select View → Normal or View → Notes Page.
When printing notes, select Note Pages and Print hidden slides.

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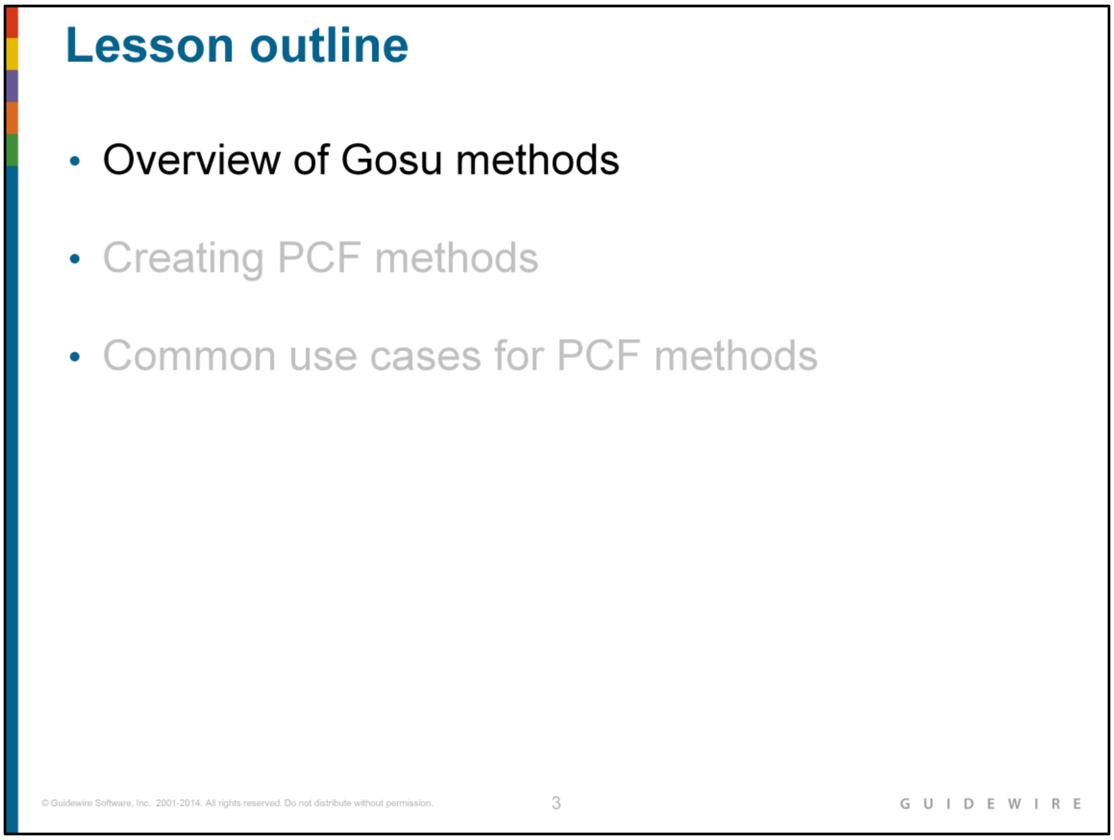

## Lesson outline

- Overview of Gosu methods
- Creating PCF methods
- Common use cases for PCF methods

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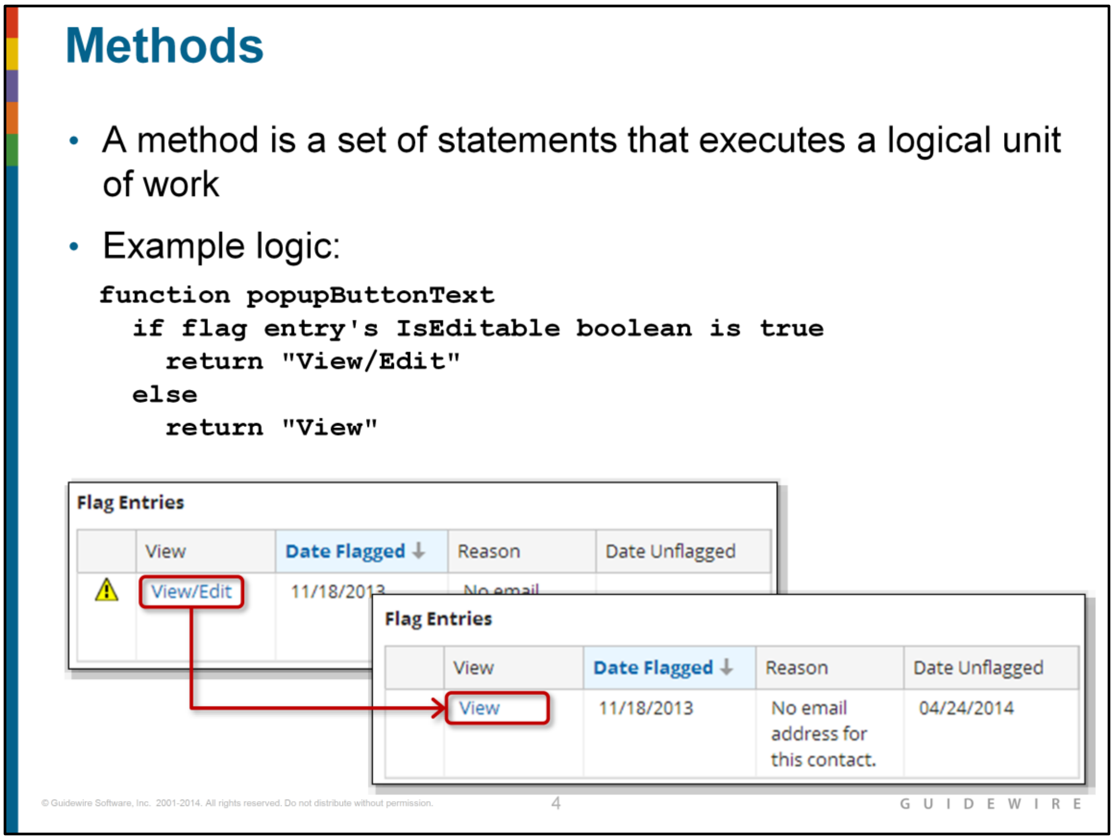

## Methods

- A method is a set of statements that executes a logical unit of work
- Example logic:

```
function popupButtonText
  if flag entry's IsEditable boolean is true
    return "View/Edit"
  else
    return "View"
```

**Flag Entries**

| | View | Date Flagged ↓ | Reason | Date Unflagged |
|---|---|---|---|---|
| ⚠ | View/Edit | 11/18/201 | No email | |

**Flag Entries**

| | View | Date Flagged ↓ | Reason | Date Unflagged |
|---|---|---|---|---|
| | View | 11/18/2013 | No email address for this contact. | 04/24/2014 |

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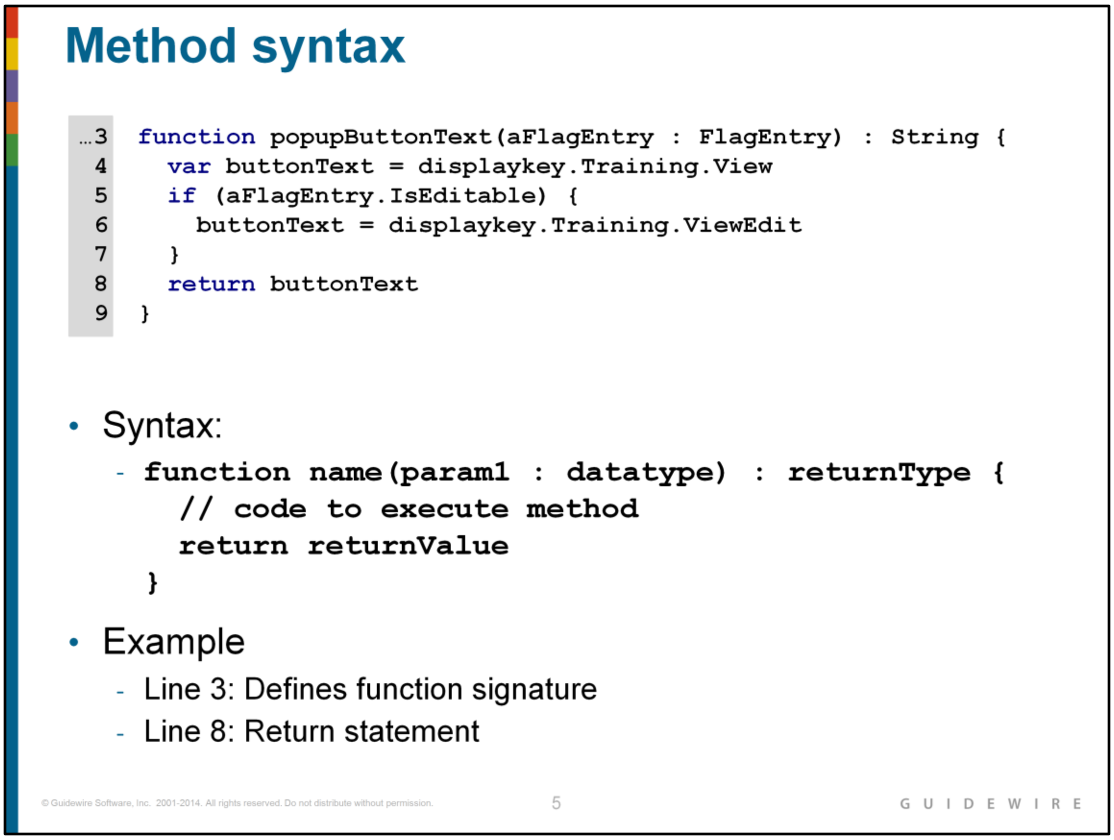
The slide example illustrates the FlagEntriesLV PCF Method, popupButtonText().

For a given flag entry, the method returns "View/Edit" if the flag entry is editable or "View" if the flag entry is not editable.

A flag entry's IsEditable field is true if the flag entry is open and the user has sufficient permissions to resolve the flag entry.



## Method syntax

```
…3  function popupButtonText(aFlagEntry : FlagEntry) : String {
 4    var buttonText = displaykey.Training.View
 5    if (aFlagEntry.IsEditable) {
 6      buttonText = displaykey.Training.ViewEdit
 7    }
 8    return buttonText
 9  }
```

- Syntax:

  -
    ```
    function name(param1 : datatype) : returnType {
      // code to execute method
      return returnValue
    }
    ```
- Example
  - Line 3: Defines function signature
  - Line 8: Return statement

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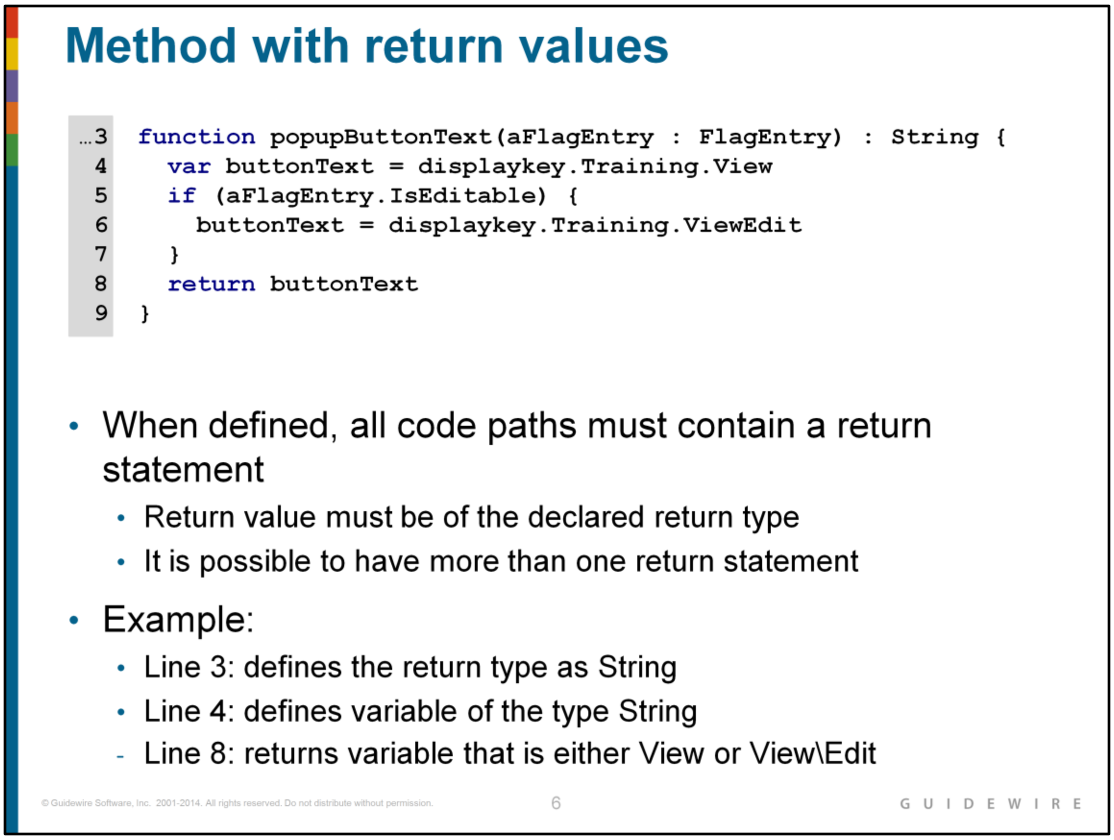
You can find the popupButtonText() PCF Method in FlagEntriesLV.pcf.

The recommended capitalization convention for methods is to use camelCase with an initial lower-case letter such as popupButtonText, calculateAvailability, or assignToNextAvailableUser.

A method can define input parameters of any data type. In the slide example, the function only defines one parameter. It is possible to have no input parameters. Multiple input parameters are comma delimited. A method can return any type of value found in Gosu, including Boolean, String, Integer, Object from the data model, Arrays and Void (no value returned). However, you can only return one type. It is possibly to return a generic list or array of objects that can be of different types.

You can precede the function keyword with one or more modifier keywords. Guidewire modifiers include public and private, which are access modifiers. A method is public by default, meaning that it can be referenced from anywhere in a Guidewire application that uses Gosu. In contrast, a private method can be referenced only within the library in which it is defined.

A method signature consists of the name, input parameters and return type. In Gosu, methods can be overloaded. When you overload a method, the name of the method is the same, but a) the number of parameters is different for the methods or b) the parameter data types are different. In all cases, the return type stays the same.



## Method with return values

```
…3 function popupButtonText(aFlagEntry : FlagEntry) : String {
 4   var buttonText = displaykey.Training.View
 5   if (aFlagEntry.IsEditable) {
 6     buttonText = displaykey.Training.ViewEdit
 7   }
 8   return buttonText
 9 }
```

- When defined, all code paths must contain a return statement
  - Return value must be of the declared return type
  - It is possible to have more than one return statement
- Example:
  - Line 3: defines the return type as String
  - Line 4: defines variable of the type String
  - Line 8: returns variable that is either View or View\Edit

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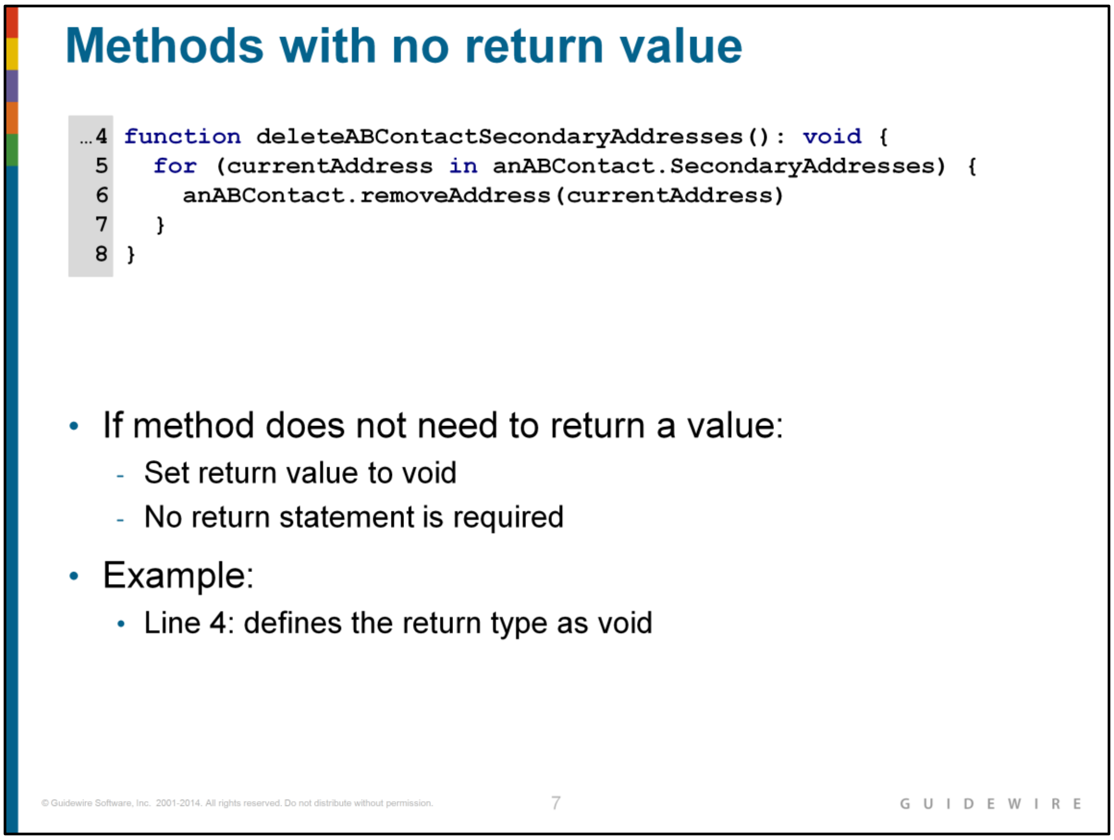
If a method's return type is not void, all code paths must return a value. Gosu requires a return statement for all possible paths through the method including all choices for conditional execution, such as if and switch statements.

It is possible to have more than one return statement. There are situations in which you want execution of the method to stop when a certain condition is met.

Gosu also mandates that a value specified in a return statement match the return type declared in the method. A missing return type or a mismatched return value generates a compiler error.

In the slide example, buttonText is defined as a String and is returned for all code paths.  The String data type is implicit in the variable declaration because all displaykeys are Strings.



## Methods with no return value

```
…4 function deleteABContactSecondaryAddresses(): void {
 5   for (currentAddress in anABContact.SecondaryAddresses) {
 6     anABContact.removeAddress(currentAddress)
 7   }
 8 }
```

- If method does not need to return a value:
  - Set return value to void
  - No return statement is required
- Example:
  - Line 4: defines the return type as void

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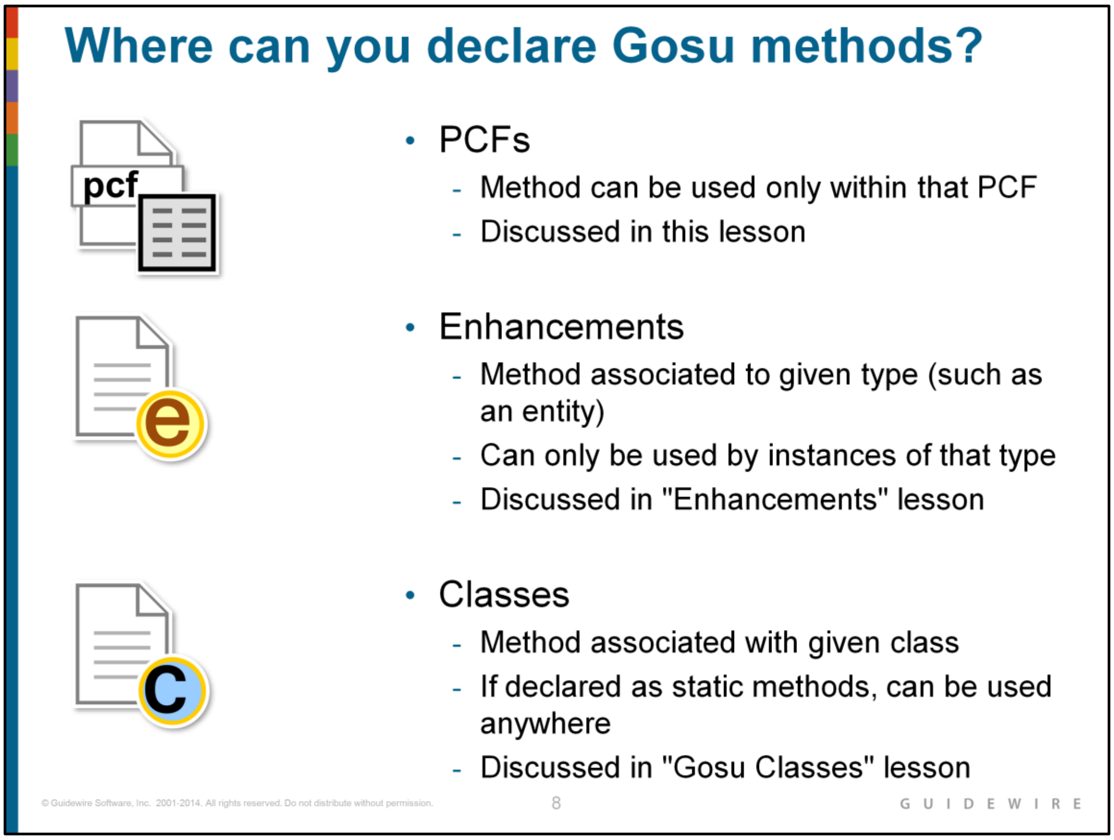
You can find the deleteABContactSecondaryAddresses() PCF Method in ABContactAddressesLDV.pcf.

A return statement is not require when no return type is defined in the function signature.



## Where can you declare Gosu methods?

- PCFs
  - Method can be used only within that PCF
  - Discussed in this lesson
- Enhancements
  - Method associated to given type (such as an entity)
  - Can only be used by instances of that type
  - Discussed in "Enhancements" lesson
- Classes
  - Method associated with given class
  - If declared as static methods, can be used anywhere
  - Discussed in "Gosu Classes" lesson

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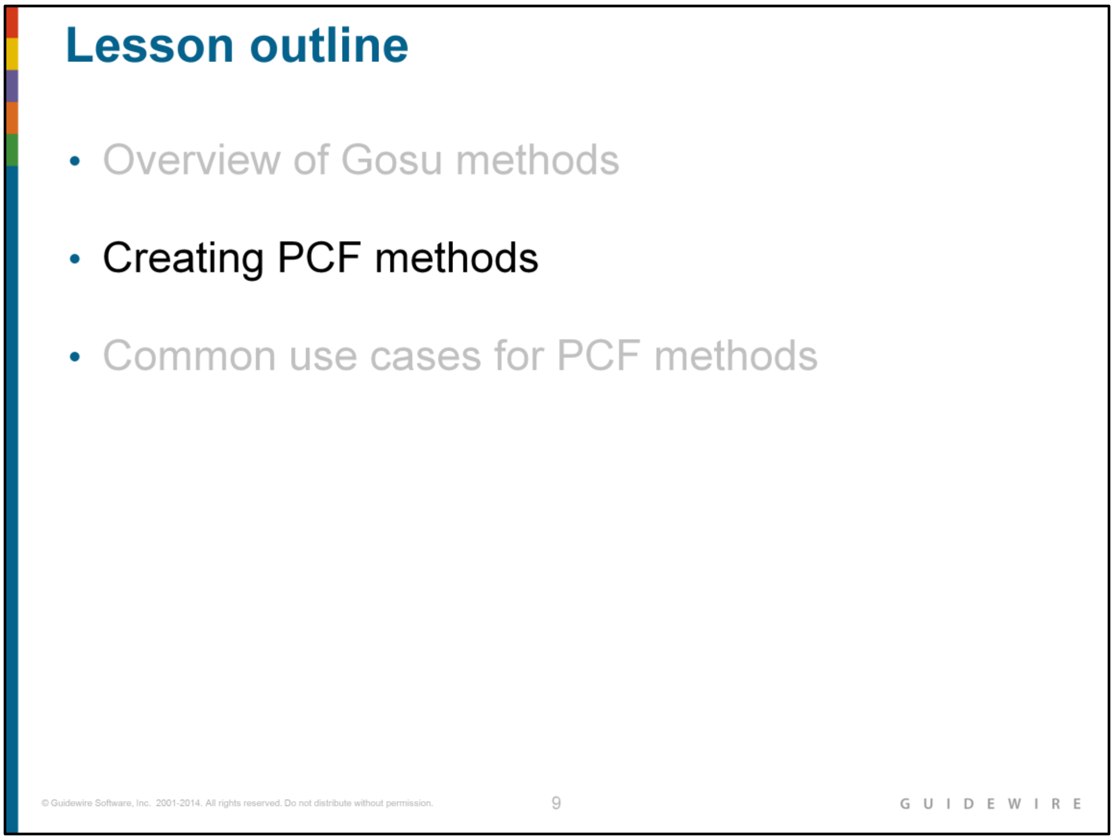
Class methods can also be non-static. In this case, the method can only be called from an instance of the class. Typically, configuration developers do not write an extensive amount of non-static class methods. Integration developers, however, typically do write both static and non-static class methods.



## Lesson outline

- Overview of Gosu methods
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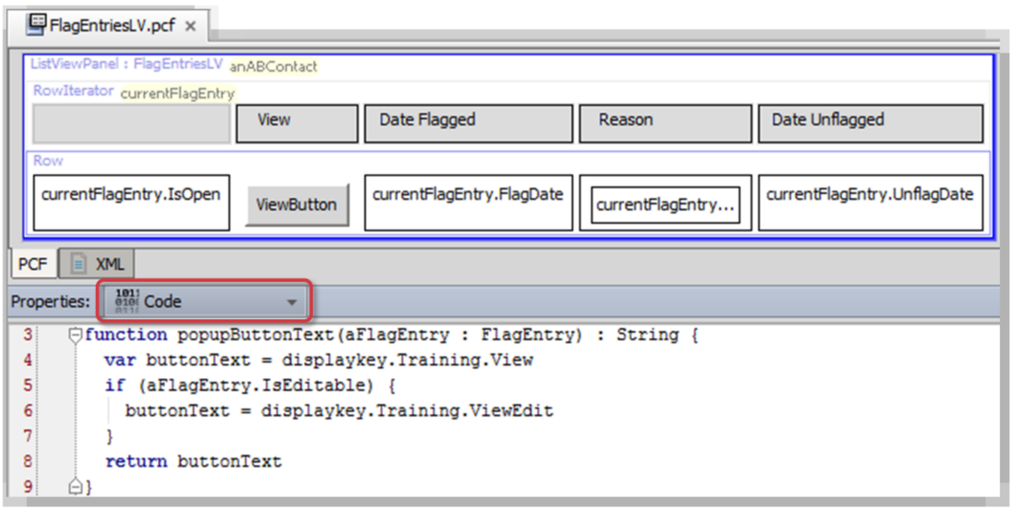
## PCF methods



```
function popupButtonText(aFlagEntry : FlagEntry) : String {
  var buttonText = displaykey.Training.View
  if (aFlagEntry.IsEditable) {
    buttonText = displaykey.Training.ViewEdit
  }
  return buttonText
}
```

- A **PCF method** is a method declared on a given PCF file's Code tab
  - Properties of PCF file or its widgets can call the PCF Method

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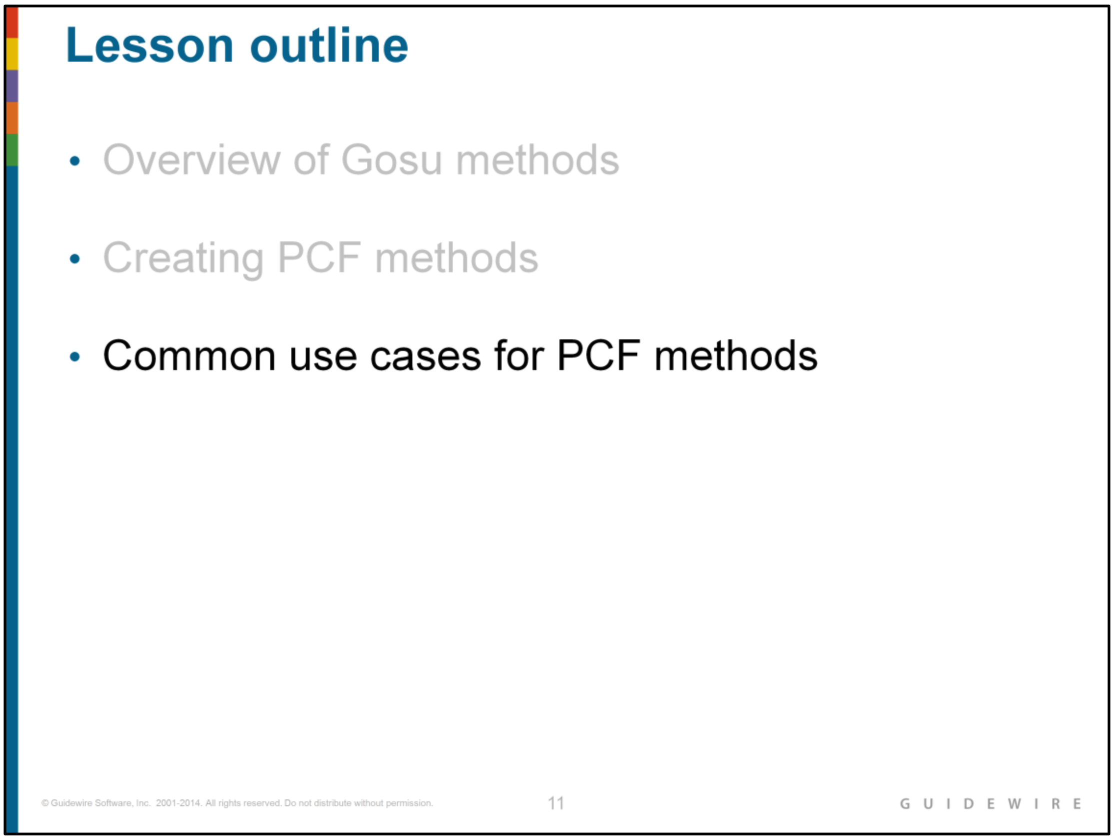
Any required variable (declared on the Required Variables tab) or non-required variable (declared on the Variables tab) is inherently known to all PCF methods. You do not need to pass a variable declared on either of these tabs to the PCF method. For example, if the method above required data from the root anABContact object, the method could simply reference anABContact. The object would not need to be included in the method declaration.
PCF methods are available only within the scope of the PCF in which they are declared. They behave as if they have the private access modifier. You can explicitly add an access modifier, but this does not change the inherent scope of the PCF method.
You can see this example in FlagEntriesLV in Studio.

Locations such as pages and popups and atomic widgets such as inputs, cells, and buttons have properties that can execute methods.

Container widgets such as detail view panels, list view panels, card view panels, and list detail panels do not have any properties that can execute methods, however.



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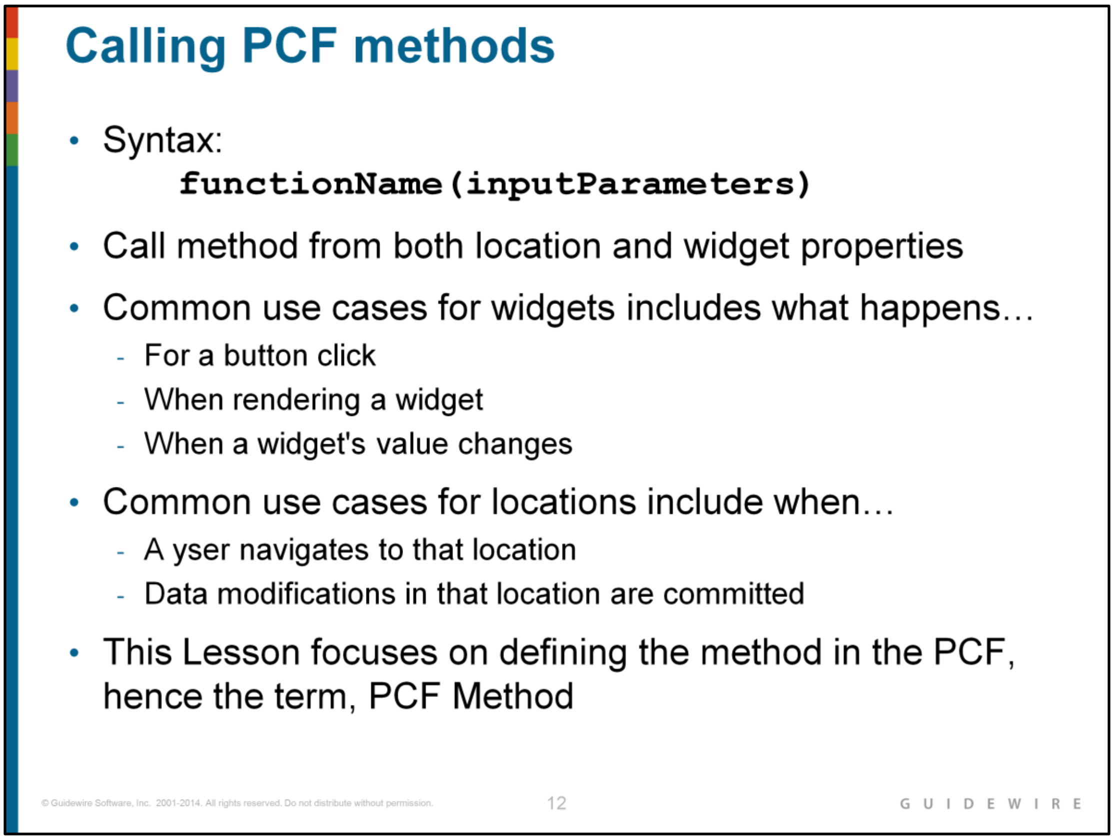

## Calling PCF methods

- Syntax:

  `functionName(inputParameters)`
- Call method from both location and widget properties
- Common use cases for widgets includes what happens…
  - For a button click
  - When rendering a widget
  - When a widget's value changes
- Common use cases for locations include when…
  - A yser navigates to that location
  - Data modifications in that location are committed
- This Lesson focuses on defining the method in the PCF, hence the term, PCF Method

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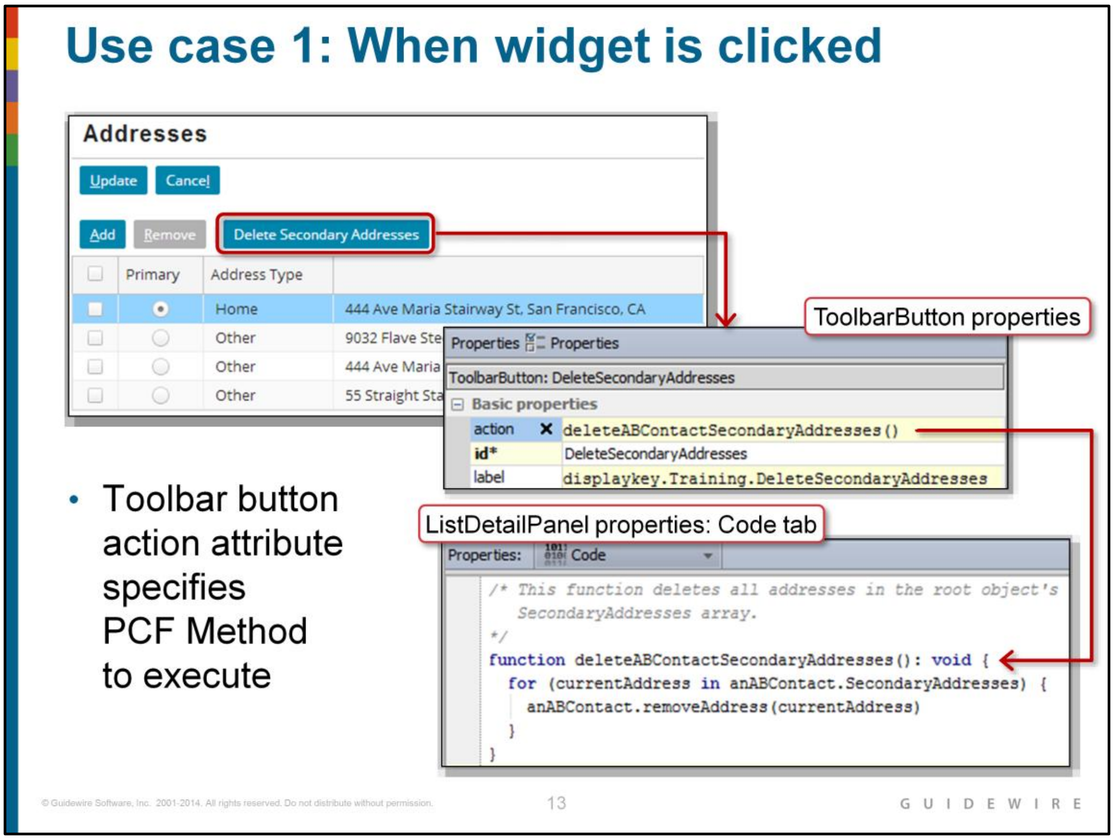
Although any method can be referenced, the remainder of this lesson focuses on PCF methods.



## Use case 1: When widget is clicked

Addresses
Update
Cancel
Add
Remove
Delete Secondary Addresses
ToolbarButton properties
ListDetailPanel properties: Code tab

|  | Primary | Address Type |  |
|---|---|---|---|
| ☐ | ● | Home | 444 Ave Maria Stairway St, San Francisco, CA |
| ☐ | ○ | Other | 9032 Flave Ste |
| ☐ | ○ | Other | 444 Ave Maria |
| ☐ | ○ | Other | 55 Straight Sta |

Properties — Properties

ToolbarButton: DeleteSecondaryAddresses

Basic properties

|  |  |
|---|---|
| action | deleteABContactSecondaryAddresses() |
| id* | DeleteSecondaryAddresses |
| label | displaykey.Training.DeleteSecondaryAddresses |

Properties: Code

```
/* This function deletes all addresses in the root object's
   SecondaryAddresses array.
*/
function deleteABContactSecondaryAddresses(): void {
  for (currentAddress in anABContact.SecondaryAddresses) {
    anABContact.removeAddress(currentAddress)
  }
}
```

- Toolbar button action attribute specifies PCF Method to execute

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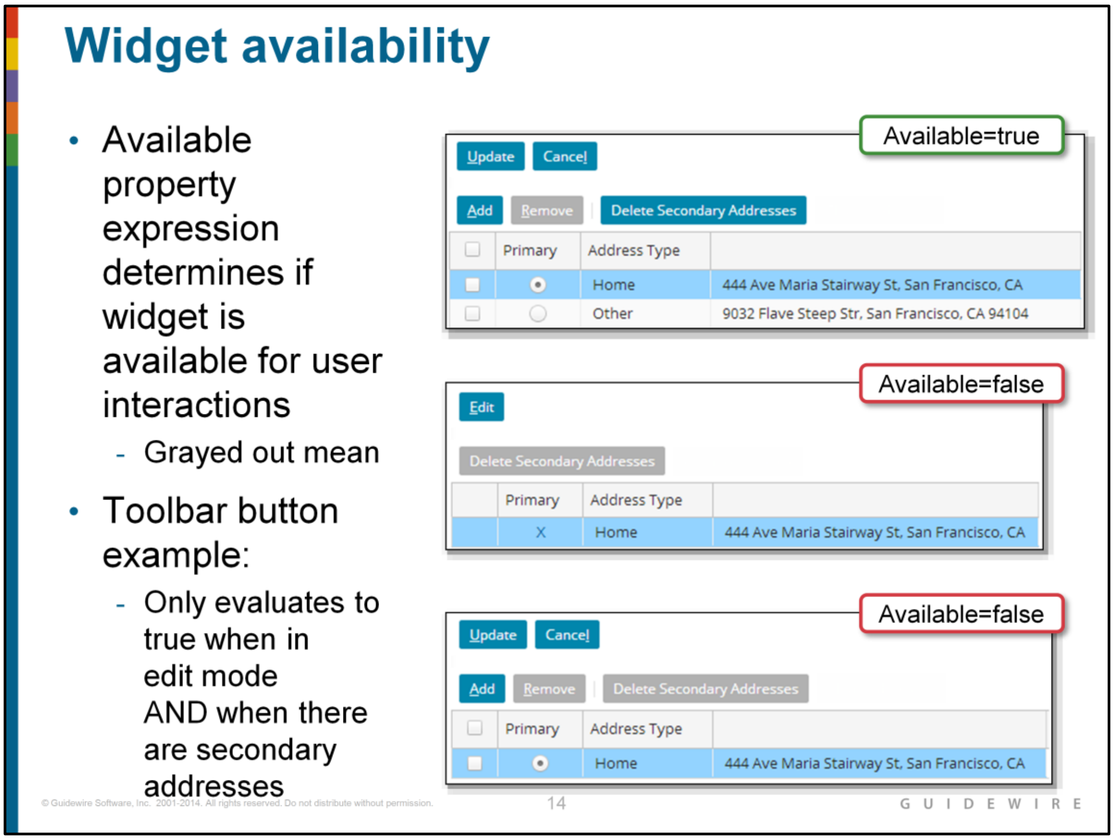
In the slide example, the ToolbarButton properties specifies an action property to use the deleteABContactSecondaryAddresses() method. The ABContactAddressesLDV is a ListDetailPanel that defines the PCF Method named deleteABContactSecondaryAddresses(). The method removes an address for given contact using the removeAddress() method for a contact.



## Widget availability

- Available property expression determines if widget is available for user interactions
  - Grayed out mean
- Toolbar button example:
  - Only evaluates to true when in edit mode AND when there are secondary addresses

| | Primary | Address Type | |
|---|---|---|---|
| ☐ | ● | Home | 444 Ave Maria Stairway St, San Francisco, CA |
| ☐ | ○ | Other | 9032 Flave Steep Str, San Francisco, CA 94104 |

| | Primary | Address Type | |
|---|---|---|---|
| | X | Home | 444 Ave Maria Stairway St, San Francisco, CA |

| | Primary | Address Type | |
|---|---|---|---|
| ☐ | ● | Home | 444 Ave Maria Stairway St, San Francisco, CA |

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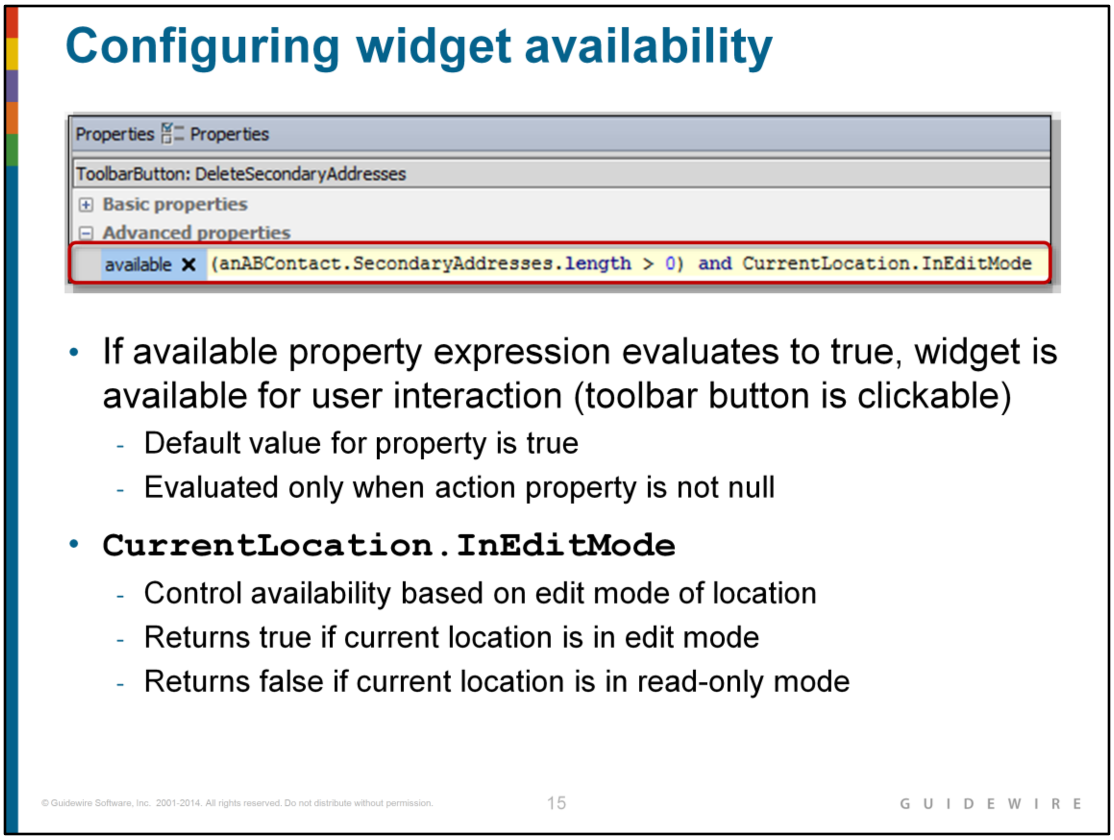
When the available property expression is true, the widget is available for user interactions. When the available property expression is false, the widget in unavailable for user interactions.

In the slide example, the Delete Secondary Addresses button is available only when the page is in edit mode AND only if the contact has secondary addresses.



## Configuring widget availability

Properties ☑ Properties

ToolbarButton: DeleteSecondaryAddresses

⊞ Basic properties

⊟ Advanced properties

| available | ✕ | `(anABContact.SecondaryAddresses.length > 0) and CurrentLocation.InEditMode` |
|---|---|---|

- If available property expression evaluates to true, widget is available for user interaction (toolbar button is clickable)
  - Default value for property is true
  - Evaluated only when action property is not null
- **`CurrentLocation.InEditMode`**
  - Control availability based on edit mode of location
  - Returns true if current location is in edit mode
  - Returns false if current location is in read-only mode

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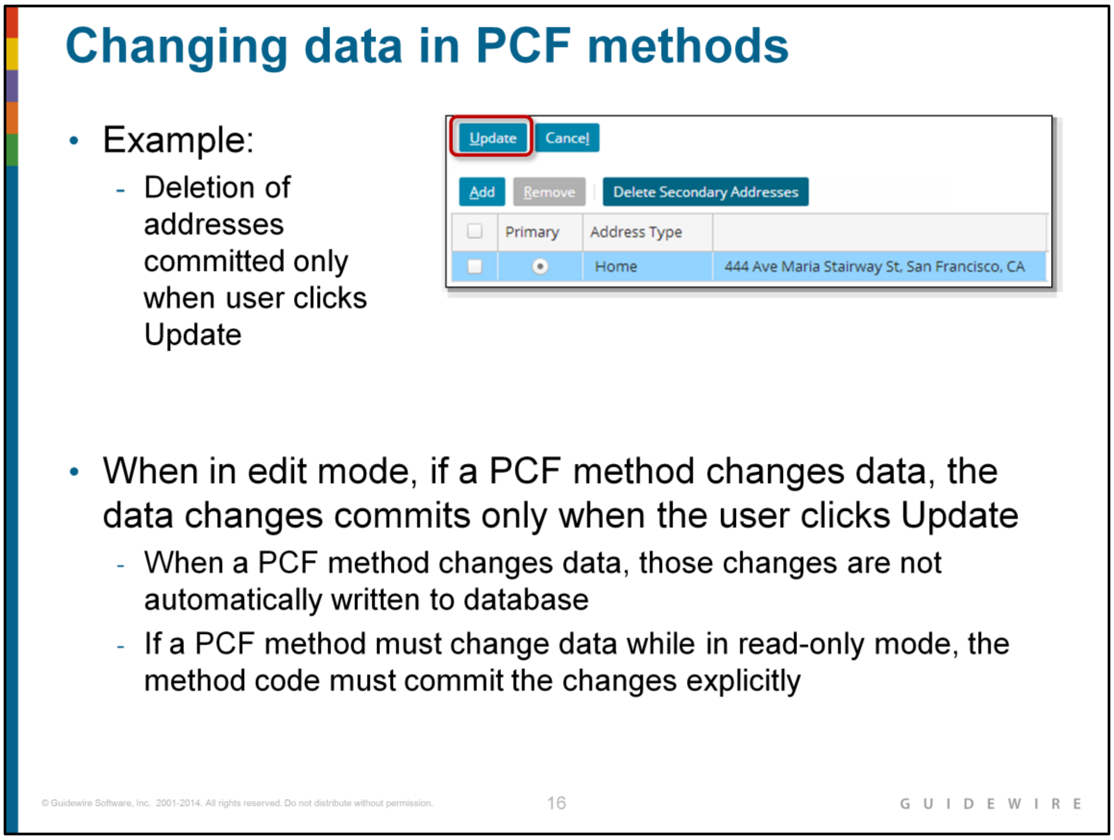
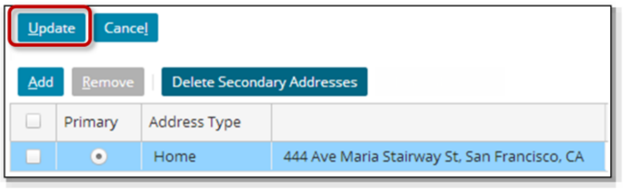
You can also use a combination of widgets and Gosu to affect whether or not a page is editable. Do the following to create a custom button that puts the current location into edit mode just like an edit button:

1. In Studio, add a Toolbar Button widget to the desired toolbar.
2. Click the Properties tab.
3. Specify CurrentLocation.startEditing() for the action property.
4. Configure other properties of the widget as desired.
5. Reload PCFs



## Changing data in PCF methods

- Example:
  - Deletion of addresses committed only when user clicks Update



| ☐ | Primary | Address Type | |
|---|---|---|---|
| ☐ | ● | Home | 444 Ave Maria Stairway St, San Francisco, CA |

- When in edit mode, if a PCF method changes data, the data changes commits only when the user clicks Update
  - When a PCF method changes data, those changes are not automatically written to database
  - If a PCF method must change data while in read-only mode, the method code must commit the changes explicitly

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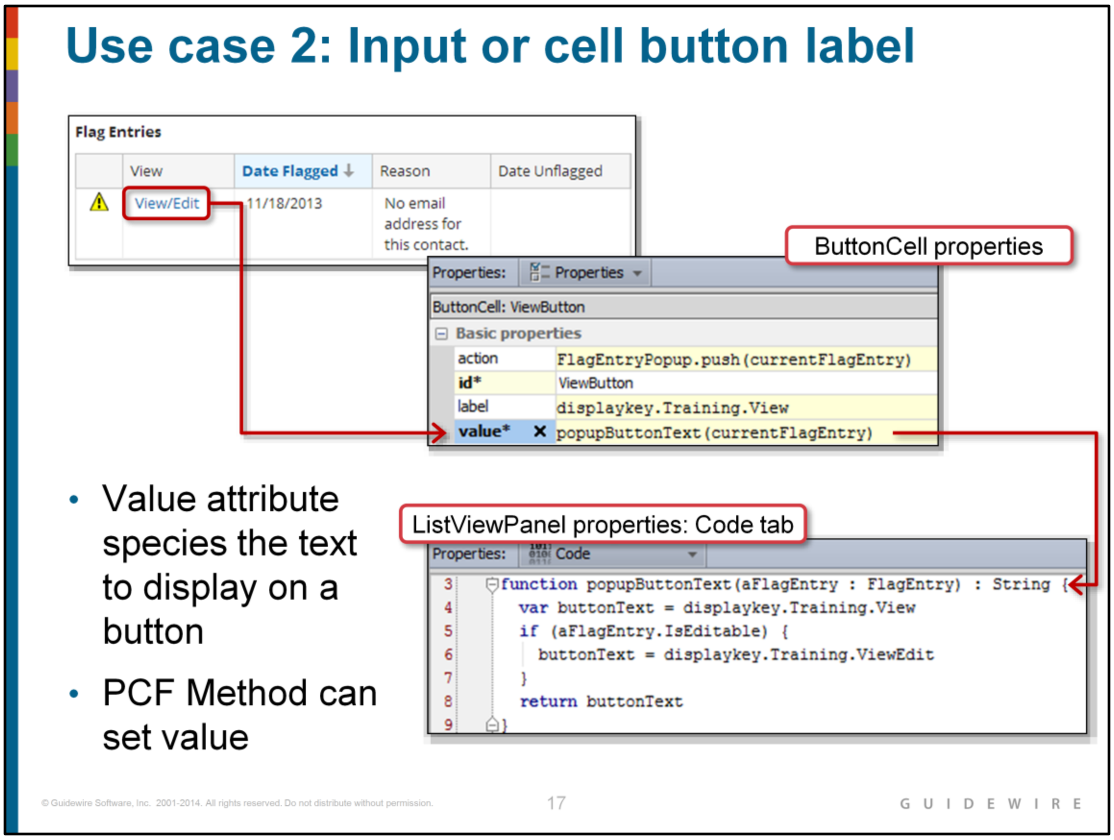
A bundle is a collection of Gosu objects that corresponds to a database transaction. Changes to data in the bundle's objects either succeed as a unit or fail as a unit. In order to manually commit data, the code must manipulate the current bundle. For more information, consult the Gosu Reference Guide.

A PCF method that is executed in read-only mode can modify data and not manually commit it. In other words, data changes to the Gosu objects are not saved to the database.

Locations have startEditing() and commit() methods. Guidewire recommends that you NOT use these methods in combination to manually commit data for a location in read-only mode. This is because the commit could throw an error if for some reason the data cannot be saved to the database resulting in the location unexpectedly in edit mode with the data unsaved.



## Use case 2: Input or cell button label

**Flag Entries**

| | View | Date Flagged ↓ | Reason | Date Unflagged |
|---|---|---|---|---|
| ⚠ | View/Edit | 11/18/2013 | No email address for this contact. | |

ButtonCell properties

Properties: Properties

ButtonCell: ViewButton

Basic properties

| | |
|---|---|
| action | FlagEntryPopup.push(currentFlagEntry) |
| id* | ViewButton |
| label | displaykey.Training.View |
| value* | popupButtonText(currentFlagEntry) |

- Value attribute species the text to display on a button
- PCF Method can set value

ListViewPanel properties: Code tab

Properties: Code

```
function popupButtonText(aFlagEntry : FlagEntry) : String {
  var buttonText = displaykey.Training.View
  if (aFlagEntry.IsEditable) {
    buttonText = displaykey.Training.ViewEdit
  }
  return buttonText
}
```

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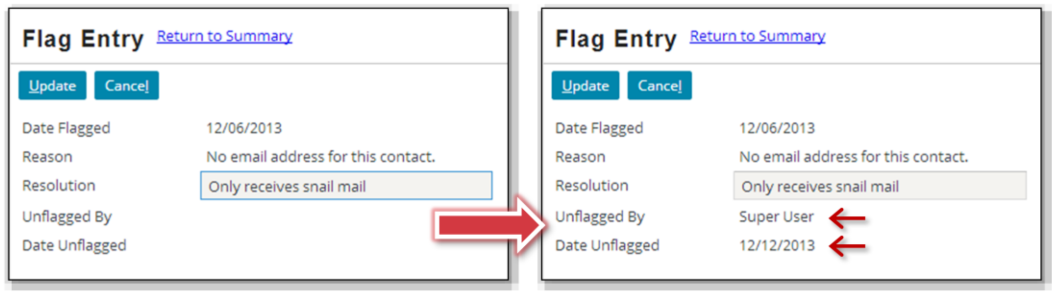
For input buttons and cell buttons, the value attribute specifies the text to display on the button. This attribute is not available for toolbar buttons.
Note that the label field for cells contains the label for the column, not for the individual cells.

## Use case 3: Targeted Post On Change



**Flag Entry**

| | |
|---|---|
| Date Flagged | 12/06/2013 |
| Reason | No email address for this contact. |
| Resolution | Only receives snail mail |
| Unflagged By | |
| Date Unflagged | |

**Flag Entry**

| | |
|---|---|
| Date Flagged | 12/06/2013 |
| Reason | No email address for this contact. |
| Resolution | Only receives snail mail |
| Unflagged By | Super User |
| Date Unflagged | 12/12/2013 |

- Targeted Post On Change onChange property method
  - Widget value change triggers changes to other widgets prior to the value being saved
  - Discussed in detail in the Partial Page Update lesson

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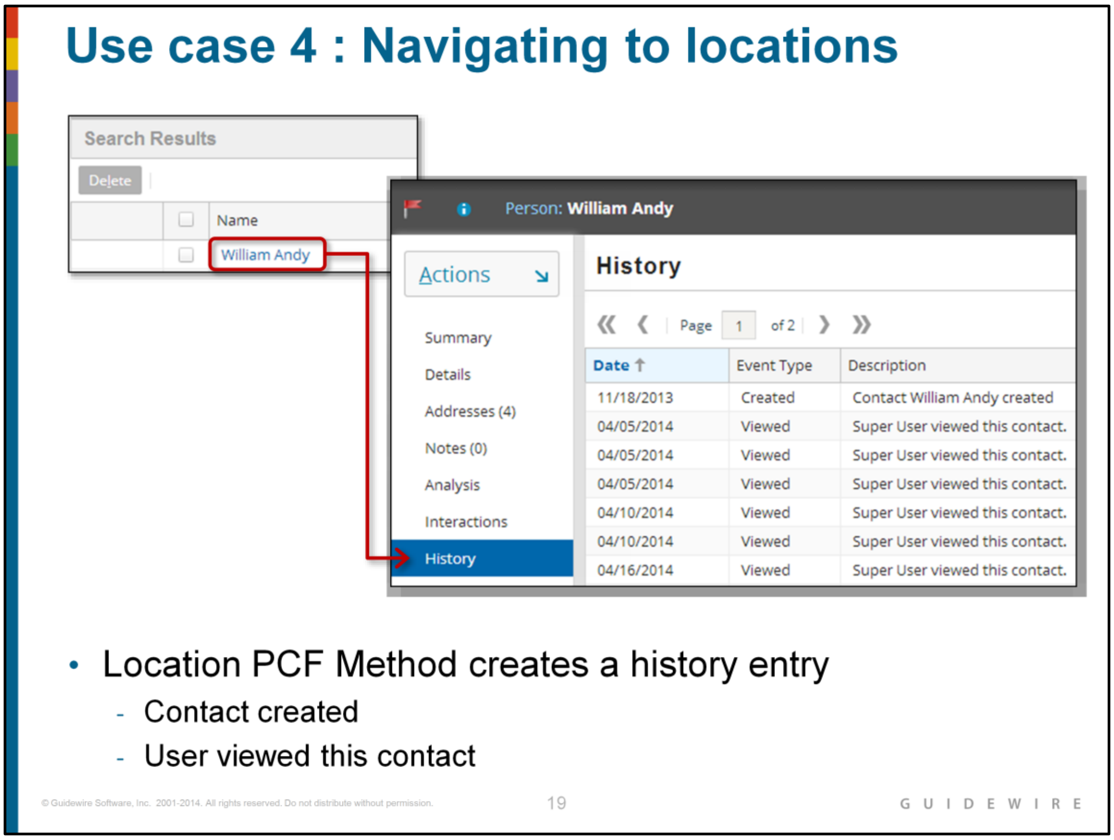
In order to improve data entry efficiency and reduce page refresh, you can configure input widgets and cell widgets to dynamically react to user input using targeted Post On Change. With targeted Post On Change enabled, it is possible to updated field values on the page and/or re-render the entire layout or a partial page layout.

Post On Change is a Boolean tab property in Guidewire Studio and allows you to define three additional properties: disablePostOnEnter, onChange, and target. The PostOnChange property tab contains the Enable targeted Post On Change checkbox. When checked, the three additional properties are editable.



## Use case 4 : Navigating to locations

Search Results

Delete

| | Name |
|---|---|
| | William Andy |

Person: **William Andy**

Actions

- Summary
- Details
- Addresses (4)
- Notes (0)
- Analysis
- Interactions
- History

**History**

Page 1 of 2

| Date | Event Type | Description |
|---|---|---|
| 11/18/2013 | Created | Contact William Andy created |
| 04/05/2014 | Viewed | Super User viewed this contact. |
| 04/05/2014 | Viewed | Super User viewed this contact. |
| 04/05/2014 | Viewed | Super User viewed this contact. |
| 04/10/2014 | Viewed | Super User viewed this contact. |
| 04/10/2014 | Viewed | Super User viewed this contact. |
| 04/16/2014 | Viewed | Super User viewed this contact. |

- Location PCF Method creates a history entry
  - Contact created
  - User viewed this contact

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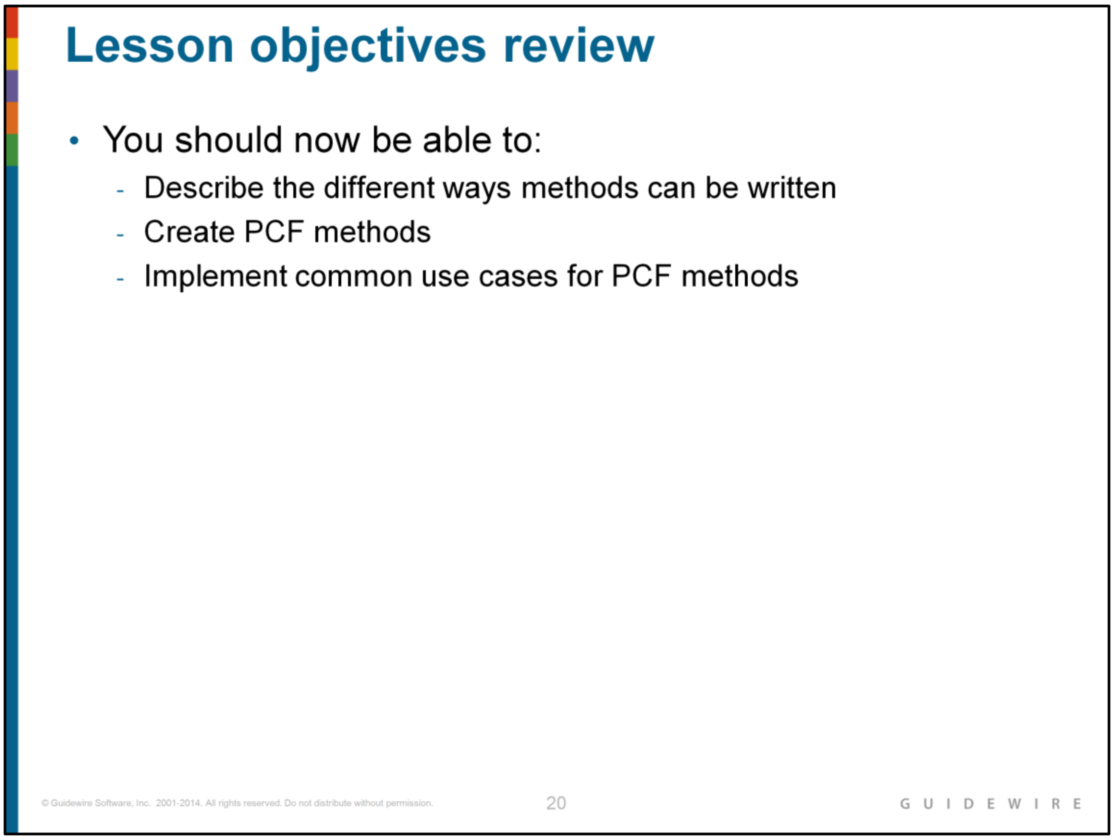
The location properties that can call PCF methods include:

- afterEnter: Executed immediately after application enters location
- beforeCancel: Executed before application cancels out of edit mode
- afterCancel: Executed after application cancels out of edit mode
- beforeCommit: Executed before application commits out of edit mode
- afterCommit: Executed after application commits out of edit mode
- afterReturnFromPopup: Executed after application returns to location from popup

Locations such as pages and popups and atomic widgets such as inputs, cells, and buttons have properties that can execute methods.

Container widgets such as detail view panels, list view panels, card view panels, and list detail panels do NOT have any properties that can execute methods.



## Lesson objectives review

- You should now be able to:
  - Describe the different ways methods can be written
  - Create PCF methods
  - Implement common use cases for PCF methods

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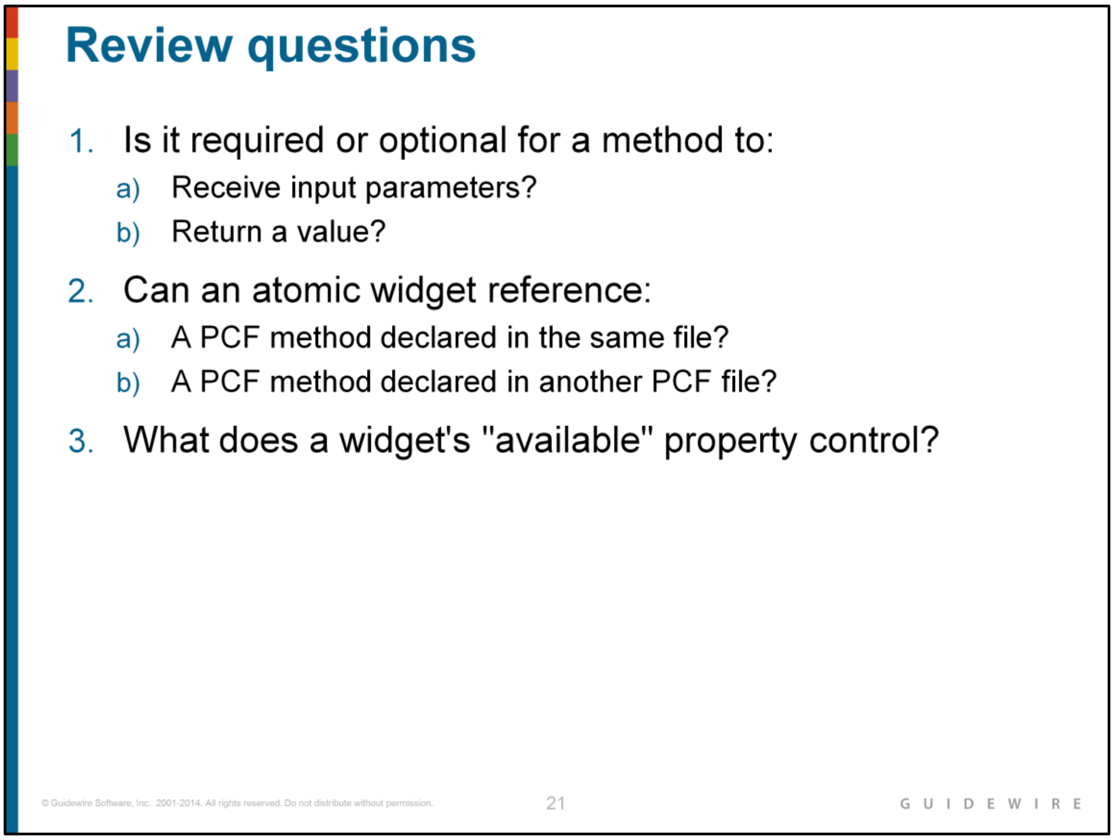

## Review questions

1. Is it required or optional for a method to:
   a) Receive input parameters?
   b) Return a value?
2. Can an atomic widget reference:
   a) A PCF method declared in the same file?
   b) A PCF method declared in another PCF file?
3. What does a widget's "available" property control?

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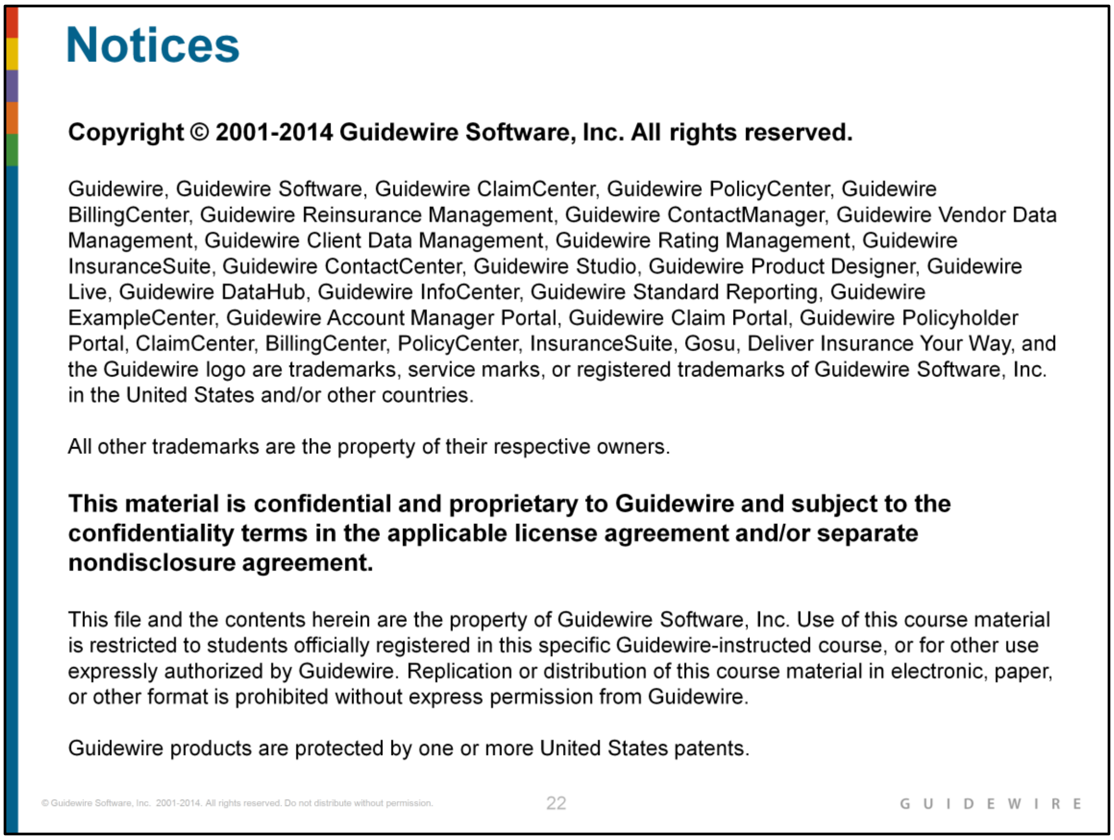
Answers
1a) Optional
1b) Optional; if a method returns no value, its return type should be listed as "void".
2a) Yes
2b) No
3) This property determines if the widget can be clicked or not.



## Notices