Specify 6: Reports and Labels

The purpose of this document is to provide solutions to common report needs and to address recurring stumbling blocks of Specify iReport users. Covered below are some of the basic elements of creating reports and labels, beginning with the Specify Query Builder and continuing with more in-depth examples of iReport capabilities.

The iReport capabilities discussed within this document include:
- Constructing expressions with the Expression Editor
- Mixed concatenation
- Styles
- Images
- Barcodes
- Report groups
- Scriptlets
- Variables
- Page orientation bug workaround, and other tips

Creating a Query for the Report

Creating a query in Specify is the first step in defining the fields and data for a report or label. Pulling the correct data without unwanted repetition or duplication is often addressed in this initial step, along with other options like sorting records. Saving a query in the Specify Query Builder will immediately make it available for use in Specify iReport.

Note: Data sets from the Specify Workbench can also be used for creating reports, but the capabilities are somewhat more limited than when using queries. A report based on a data set rather than a query has fields that are less easily manipulated and it will only run data from the data set rather than the entire database. However, the capabilities within Specify iReport are the same when working with either data set- or query-based reports.

Fields that cause duplicates

Certain fields and tables are likely to cause duplicate labels or records to run. For instance, labels based on a Collection Object query are prone to duplicating when there are multiple Preparations, Determinations, or Collectors associated with the single Collection Object record.

> **Solution**: Add the entire table to the query as an aggregated field instead of adding individual fields from that table.
>
> For instance, instead of adding 'first name' and 'last name' from the Collectors Agent table to a query, double-click 'Collectors' to add it to the query as an aggregated field. Upon applying the 'Collectors' field to the report, a list of collector agents will be displayed instead of several record details for each different collector.
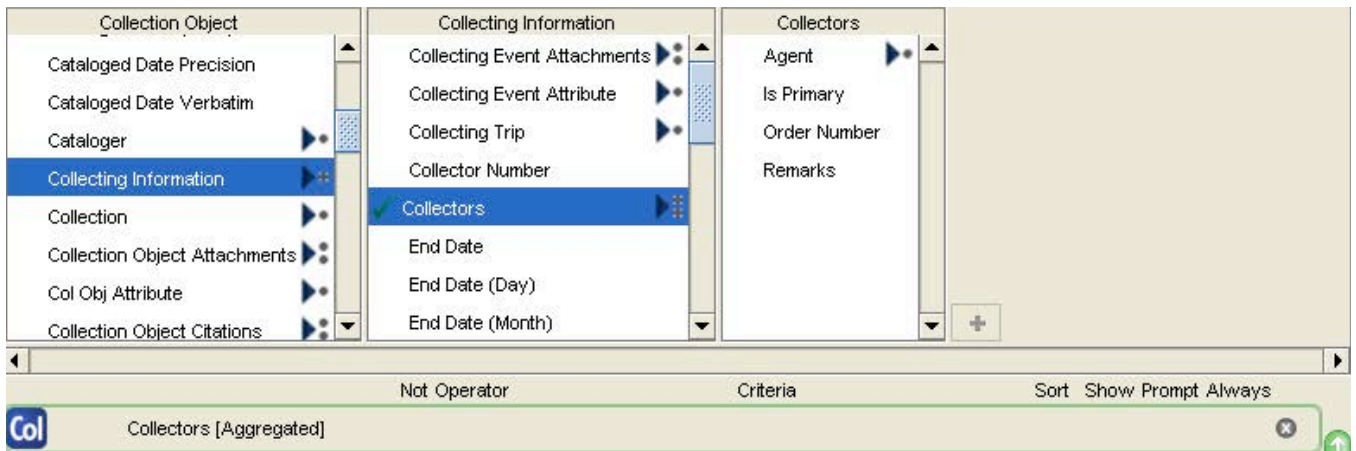

Multiple Determinations should be handled differently; add the "Current" field to the query, setting the criteria to "Yes". This way, only the current determination will print a label. Make sure that the "Always" condition is checked so that this condition is used when running the label from record sets, query results, etc. See screenshot below.
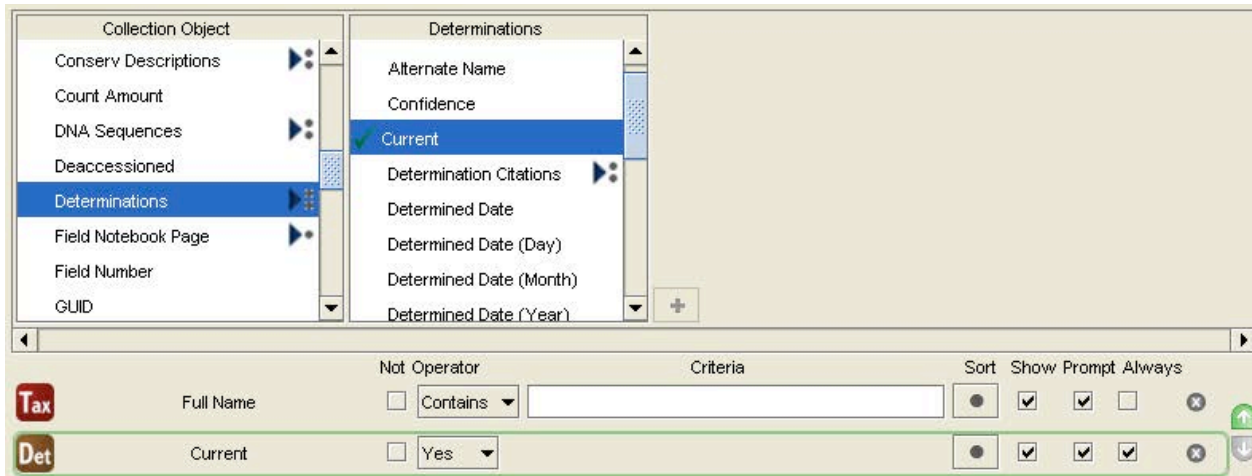
Sorting Label or Report Contents

To sort the results of a query (and report) use the Sort button to the right of the field criteria box.
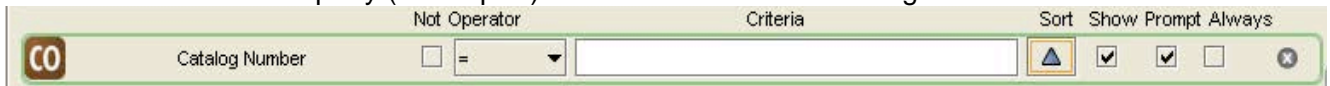

iReport Basics

Specify iReport is simplified for Specify users, because the datasource connections are already created, so a JDBC connection does NOT need to be set up. Furthermore, the report fields can be easily manipulated (added/removed) in the Specify Query Builder rather than using SQL queries.

Getting started

- Log in to Specify iReport under the same username that was logged in when saving the query. Queries are only available in Specify iReport to the user who built them.
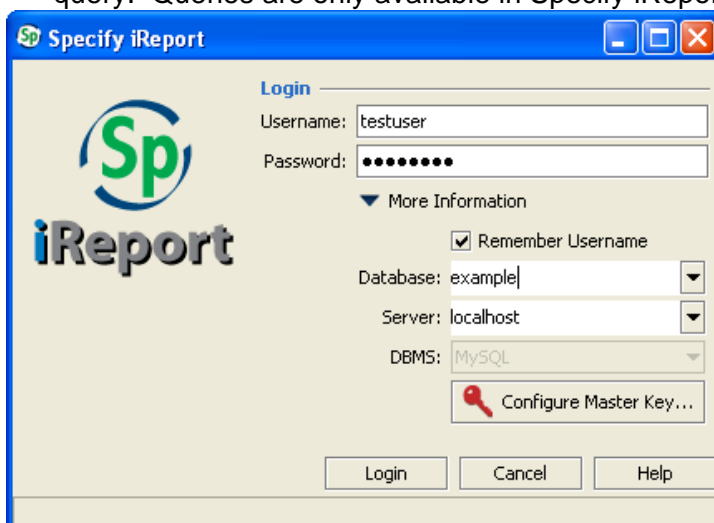
- If there are multiple disciplines in the database, select the discipline that the query is saved in or intended to be saved in.
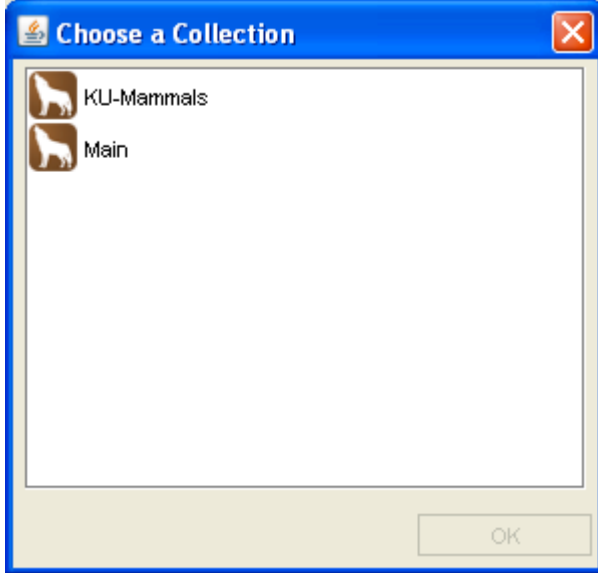
- Once iReport has launched, access the query that is saved in Specify and begin creating your report by selecting File>Report Wizard or using this button:
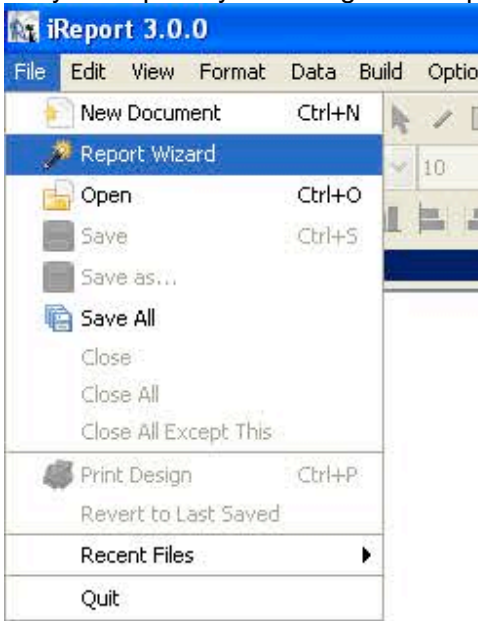
- A list of available queries will display. After selecting your query from the list, the Report Properties window will open (shown below).
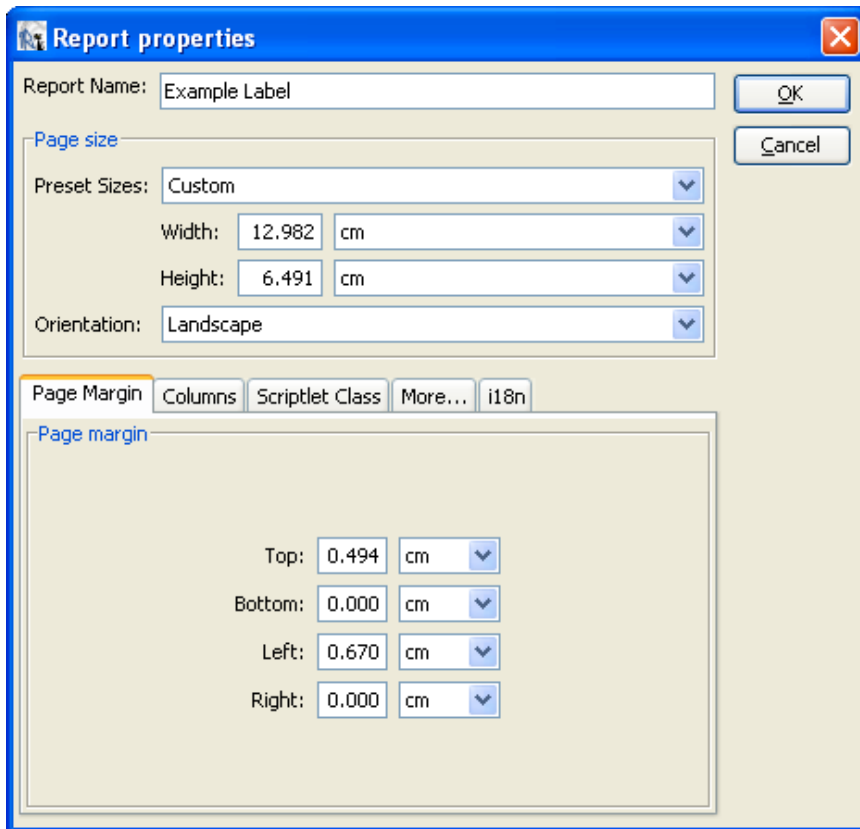
Report Properties

You will probably have to refer back to Report Properties frequently in the process of creating a report in order to set and modify, among other things:

- Page size and orientation
- Margins
- Columns
- Scriptlet class

Click OK to confirm Report Properties, and the blank report template will appear. To get back to the Report Properties utility, click Edit in the toolbar and select Report Properties from the dropdown menu.

Report Bands

The template for a new report will look similar to the screen capture below. The available bands include Title, Column Header, Detail, Summary, and others, which can be expanded or minimized by dragging the horizontal lines up or down. (NOTE: Band height can also be set by right-clicking the report template, selecting Band Properties, and entering the height in pixels. This is especially useful once a band has been minimized, if it needs to be expanded again.)

The Detail band is an important template aspect with which to be familiar. Any query field that you place in the Detail band will be filled with values from each record used to run the report. For loan invoices and specimen labels, the Detail band generally contains Collection Object data. The other bands, such as Title and Summary, will only display record data *one time* for each report and usually include such data as title, date, agent information, and institution information.

Labels often only consist of the detail band, with all of the other bands minimized to zero.

Adding Fields to a Report

Fields that are saved in the query are listed in the Document Structure pane. Expand the plus next to "Fields" to view all available fields for the report.
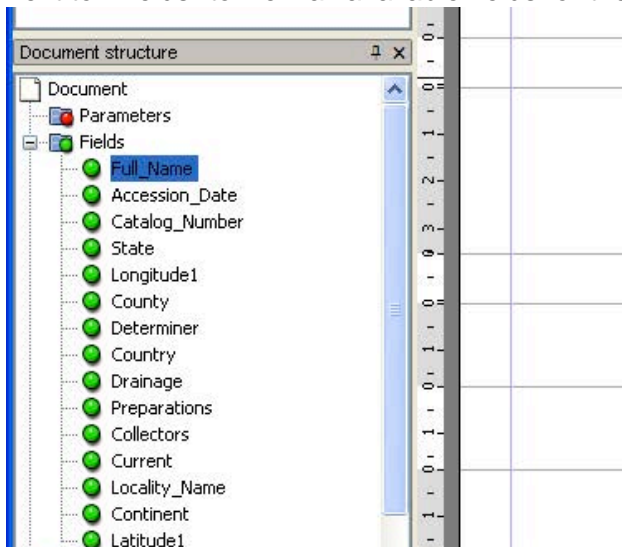
(NOTE: The Document structure pane should already be present on your iReport workspace, but if it is not, go to the toolbar and click View>Docking Panes>Document Structure.)
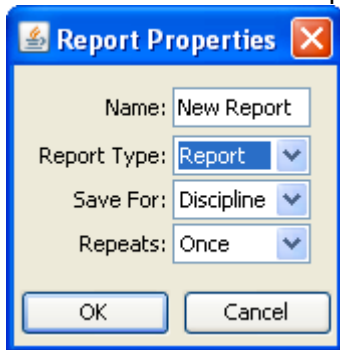
Click on a field in the Document structure pane and drag it onto the report template to add it to the report.

Saving a Report

- To save changes to a report or label, go to the top toolbar and click File> Save.
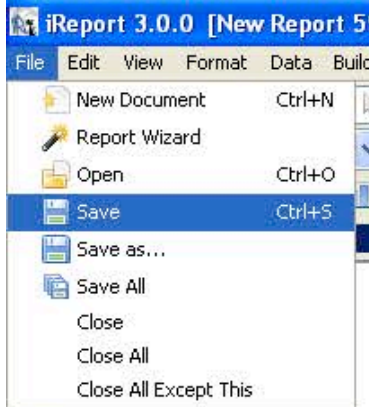
- A Save version of Report Properties dialog will pop up.

- The uses of the Report Properties Save dialog are as follows:
    - **Name**: edit report name.
    - **Report type**: choose from Report, Label, or Invoice. This does not affect the report, it simply tells Specify which heading to put the report's name under in the left-hand pane of the Reports page.
    - **Save for**: designate who can view the report in Specify, User or Discipline.
    - **Repeats**: the last option allows you to print multiple labels or reports by setting a constant number or by a numeric Specify field, such as the Prep Count field. If you choose 'By Field' from the Repeats pick list, as many labels or reports will run as specified by the numeric value in that field. Example of the 'By Field' option shown below.
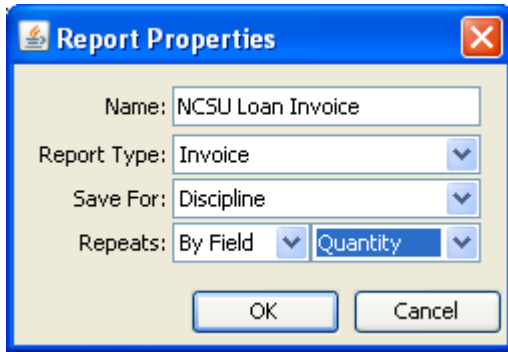
- Click OK to confirm the Report Properties. After the report has been saved and closed, you can access it again in iReport by going to File>Open. Make sure that you log in with the username under which the report was created.

Using the Expression Editor

In iReport, the Expression Editor is used for editing single fields or combining multiple fields together in the same expression. To access it, right-click on a field that has been added to the report template, and select Edit Expression.
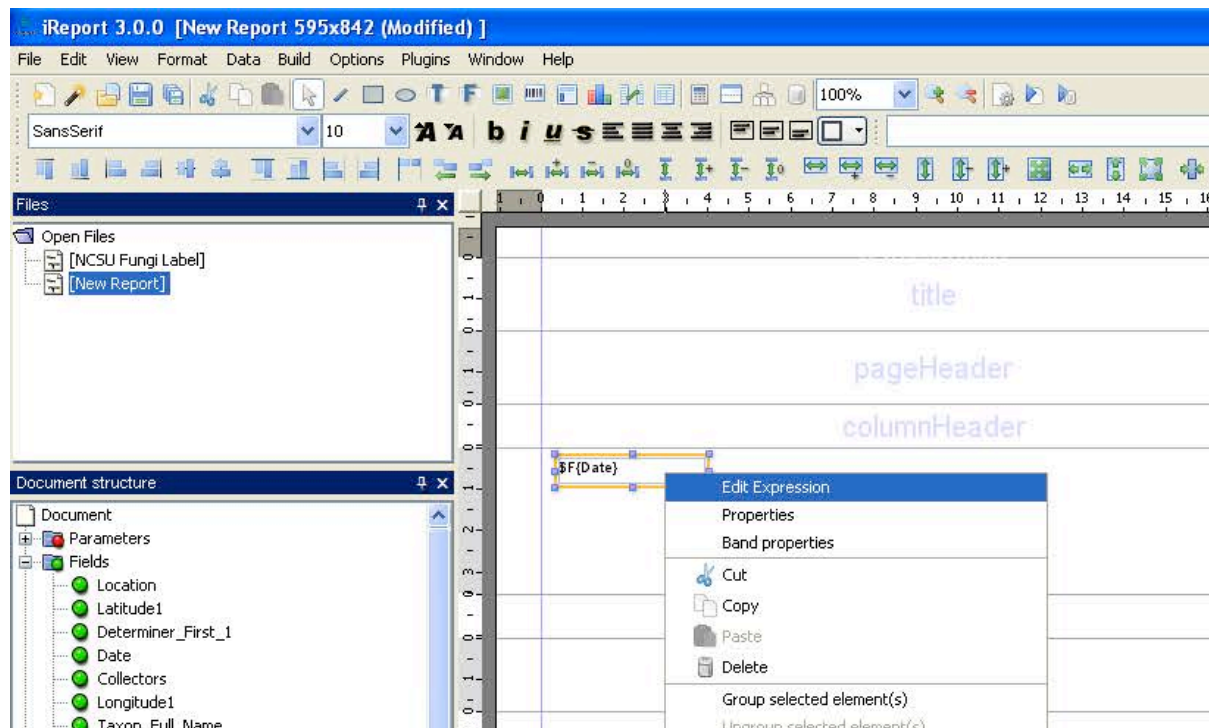

Among other things, the Expression Editor lists the available fields below the editing box. Clicking on a particular field in the center column opens a list of possible field modifiers in the last column. The type of modifiers available depends on the type of field (i.e. string, integer, Boolean, etc.) Double-clicking a field will add it to the editing box.
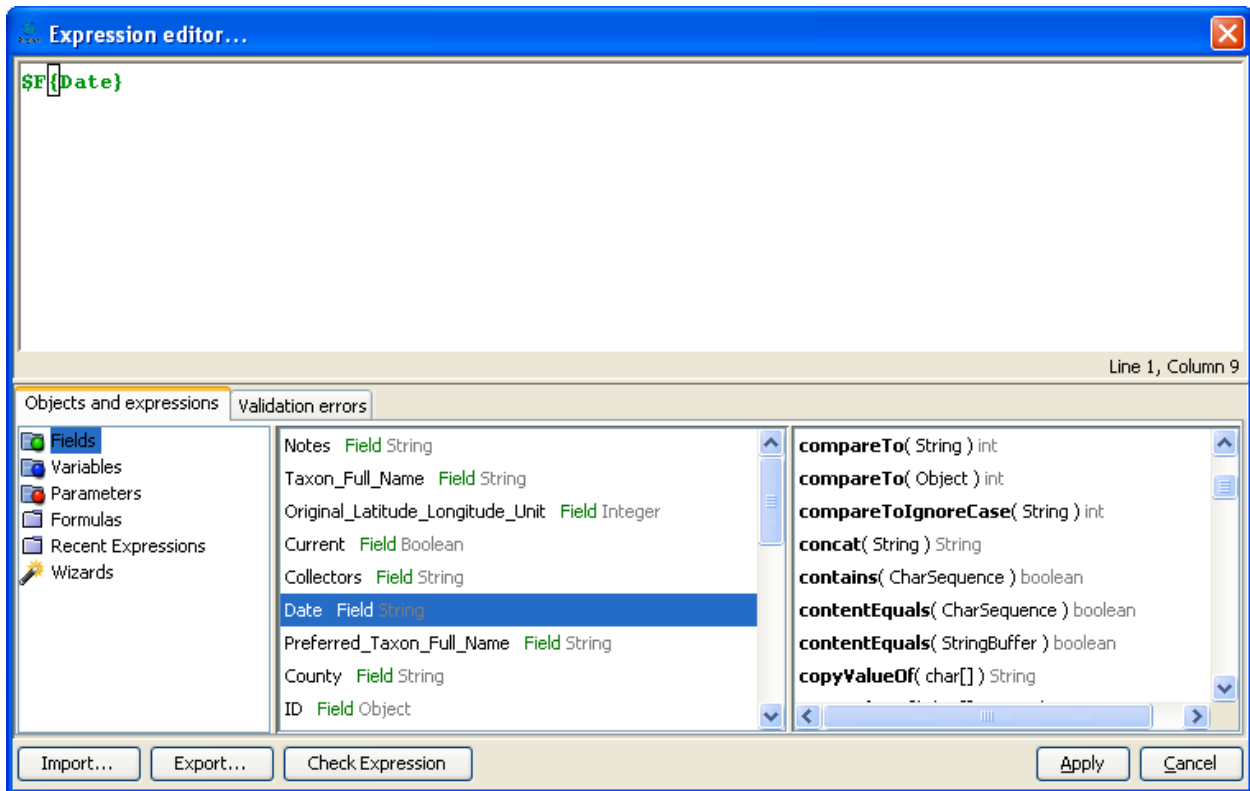
Avoiding "null" Values in Reports and Labels

When a field is blank in the database, it will appear on the report or label in Specify as a "null" value. This can be avoided with two different methods:

1. The first and simplest option is to check "Blank when null" in the Properties pane on the right side of the screen.
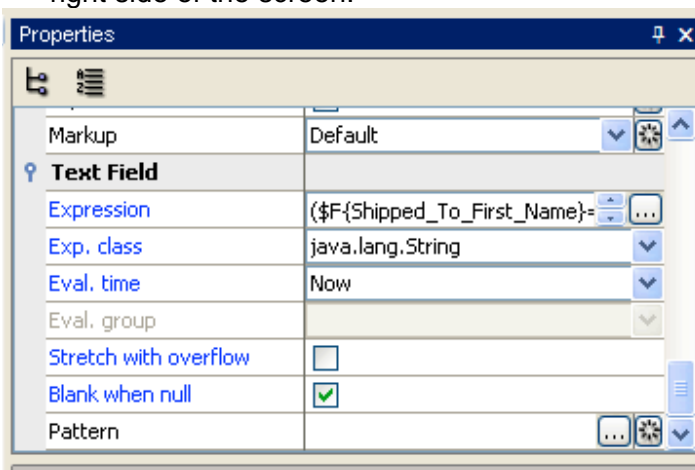

- The drawback of the "Blank when null" property is that it only works with a field that has not been edited with the Expression Editor. For instance, if you are combining different fields into a single expression, or if there is static text (any text enclosed in quotation marks) in the box with the field in question, you will have to use the second option to avoid null values.

2. The second way to avoid null values in a report is to use an 'if null, then' statement for each field, enclosed in parentheses. To use the 'if null, then' statement, right-click the desired field on the report template and select Expression Editor. The basic formula to use for the field is:

($F{X}==null ? "": $F{X})

…which means: If the field ($F{X}) is empty, then print "" for: the field $F{X}.

Applied to a date field in the Expression Editor:
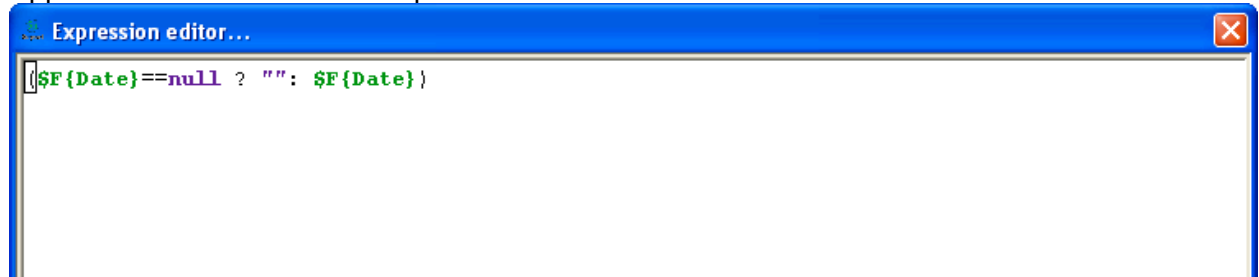
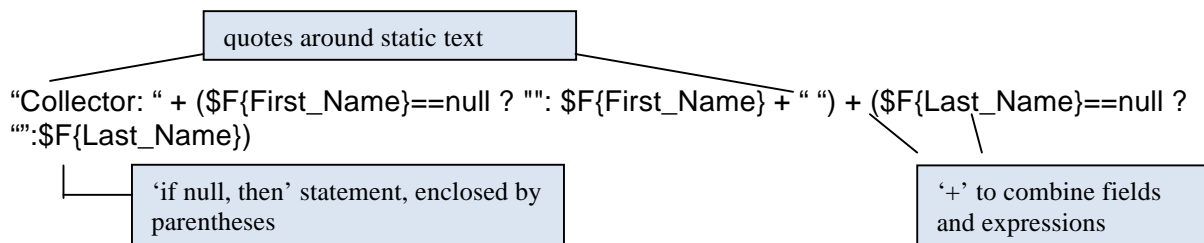Note that any static text added in the expression after ? "": will only print if the field is not empty. For example:

($F{Date}==null ? "": "Date: "+$F{X})

The above expression will print "Date: 08/22/2010" if the value in the field is 08/22/2010. If there is no value in the field for a given record, nothing will be printed.

Basics of Expression Writing

1. Employ the 'if null, then' statement for any fields that may have null values in the database.
2. Start and end parentheses should go around the entire 'if null, then' statement for separate fields, which should then be combined in the expression using a '+'
3. Combine dynamic fields and static text using a '+'
4. Place quotes around a space, comma, label, or any other static text that should display with the dynamic fields.

Sample: (Expression to display last name and first name fields as 'Collector: John Smith')

quotes around static text

"Collector: " + ($F{First_Name}==null ? "": $F{First_Name} + " ") + ($F{Last_Name}==null ? "":$F{Last_Name})

'if null, then' statement, enclosed by parentheses

'+' to combine fields and expressions

Replacing Values Using Modifiers

The most common uses of modifiers for replacing values are for the Sex pick list and dates (loan date, collected date, cataloged date, etc.) Here are a few example scenarios:

- A user wants sex pick list values of 'M', 'F', and 'UN' from the database to display as 'Male', 'Female', and 'Unknown' on the labels. The expression would appear as such:

$F{Sex}.equals("M") ? "Male" : $F{Sex}.equals("F") ? "Female" : $F{Sex}.equals("UN") ? "Sex Unknown" : ""

- A user is using a sex info field in Specify that can contain multiple values, such as 'F', 'Female', 'M', 'Male', and perhaps other data. Example of data in Specify:
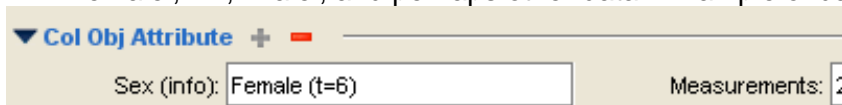
The user wants to use a symbol for the sex instead of text, with any other data in field displaying after. So the expression must account for the multiple sex values:

($F{Sex_(info)}==null ? "": $F{Sex_(info)}.replace("Female","♀").replace("F", "♀").replace("Male", "♂").replace("M","♂"))

On the label, the data will display as:
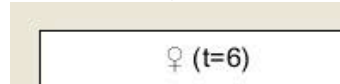
- Dates are saved in the database in the format "08/22/1994," but the user wants their labels to display "22/Aug/1994." The expression would then look like this:

($F{Date_(Day)}==null ? "": $F{Date_(Day)+"/"}.toString()+($F{Date_(Month)}==null ? "": $F{Date_(Month)}+"/").toString().replace("10","Oct").replace("11","Nov").replace("12","Dec").repl ace("1","Jan").replace("2","Feb").replace("3","Mar").replace("4","Apr").replace("5","May").replace("6","Jun").replace("7","Jul").replace("8","Aug").replace("9","Sept")+($F{Date_(Year)}==null? "": $F{Date_(Year)+""}).toString()

- To make a date have zeros in front of one-digit numbers (ex: 2012/07/02 vs. 2012/7/2) use this expression: Note that for this report the order is year-month-day, which isn't usual. You can change it around to make it whatever the institution wants.

"Date: " + ($F{Loan_Date_(Year)}==null?"":$F{Loan_Date_(Year)}+"").toString() +($F{Loan_Date_(Month)}==null?"":"/"+(($F{Loan_Date_(Month)}+"").toString().length() == 2 ? ($F{Loan_Date_(Month)}+"").toString(): "0" + $F{Loan_Date_(Month)}+"")).toString() + ($F{Loan_Date_(Day)}==null?"":"/" + (($F{Loan_Date_(Day)}+"").toString().length() == 2 ? ($F{Loan_Date_(Day)}+"").toString(): "0" + $F{Loan_Date_(Day)}+"")).toString()

- For dates that are listed day-month-year, use the following expression: (replace the hyphens with slashes if you wish)

"Det. Date: "+($F{Determined_Date_(Day)}==null?"":$F{Determined_Date_(Day)}+"-").toString()+($F{Determined_Date_(Month)}==null?"":$F{Determined_Date_(Month)}+"-").toString()+($F{Determined_Date_(Year)}==null?"":$F{Determined_Date_(Year)}+"").toString()
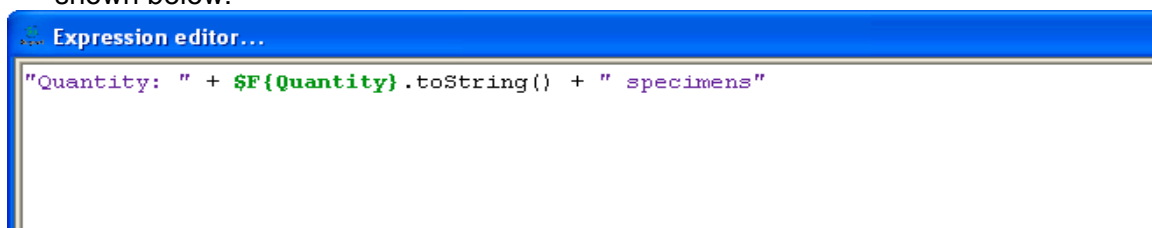
Non-string Fields in Expressions

All dynamic fields use an Expression Class that determines how they will be evaluated. Most dynamic fields from Specify are String, but some number fields can be Integer, Float, BigDecimal, etc. Fields of different classes are not compatible and, therefore, cannot be combined in a single expression without some extra steps.
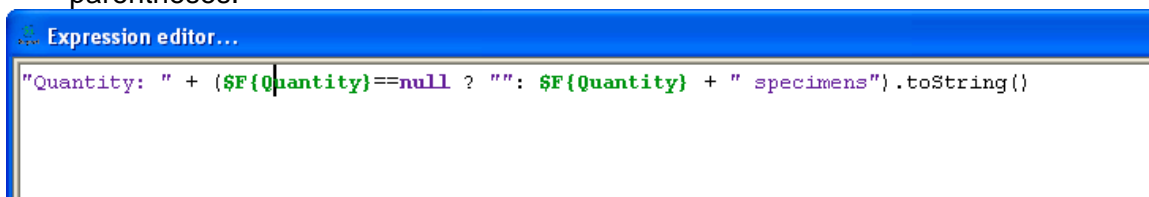
1. Right-click the non-string field and select Expression Editor. Note that the field type is listed beside the fields in the Expression Editor.
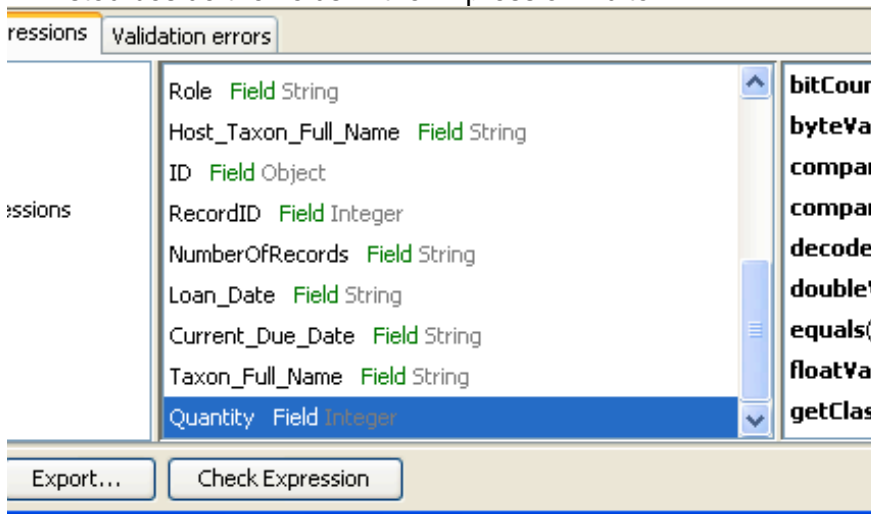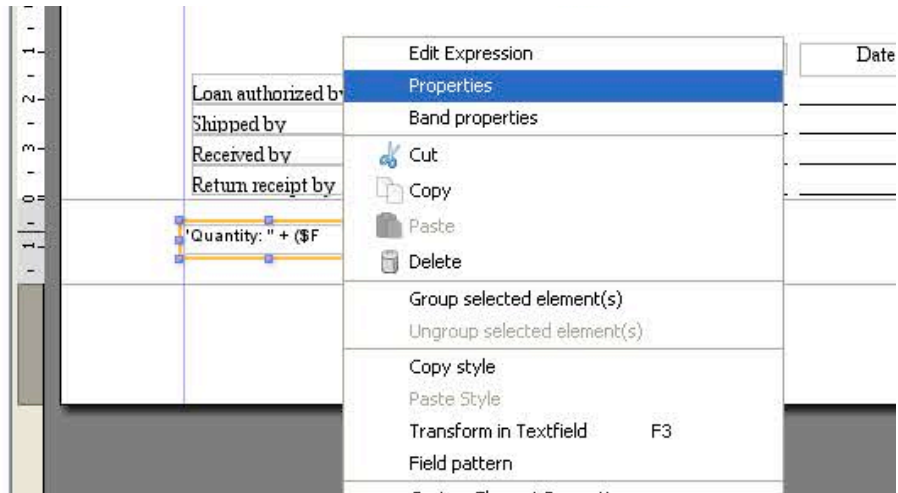

2. In order to combine a non-string field with static text, apply the modifier .toString(), as shown below:
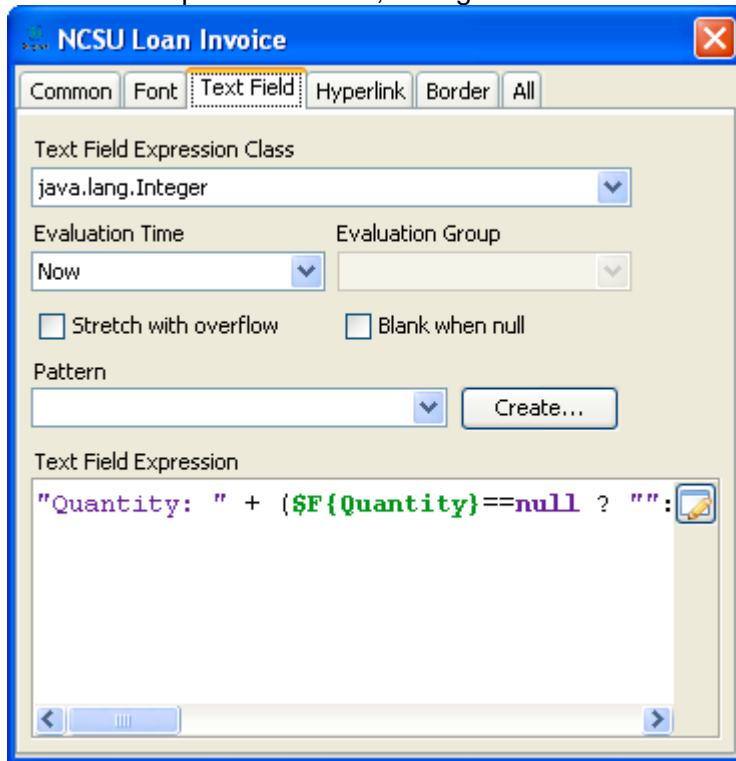

- When using an 'if null, then' statement with a non-string field, place the modifier after the parentheses.
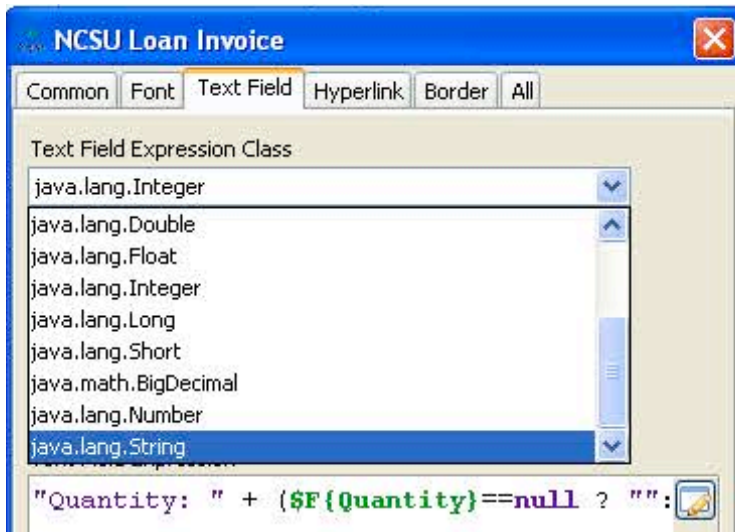

3. Apply the expression.
4. Right-click the field again and select Properties.

- In the Properties window, change the tab to Text Field.

- Change the Text Field Expression Class to java.lang.String

- Save the report.

Note: If you have set a non-string field to String in iReport and are still getting an error related to the text field expression class (cannot cast from String to Integer, for example) when running the report in Specify, go back to the Expression Editor in iReport. If the field being set to String is in a simple 'if null, then' statement, like this:

($F{X}==null ? "": $F{X}).toString()

try adding + "" to the second half of the parenthetical statement, like this:

($F{X}==null ? "": $F{X} + "").toString()

This should prevent the expression from causing errors in future.

Mixed Concatenation

Mixed concatenation refers to the combining of different font styles in the same expression.

In the Expression Editor, use the following examples as guidelines.

Replace the $F{X} with either the dynamic field or static text that is to be concatenated within a larger expression. If static text is to be concatenated, place quotes around it.

For bold text:

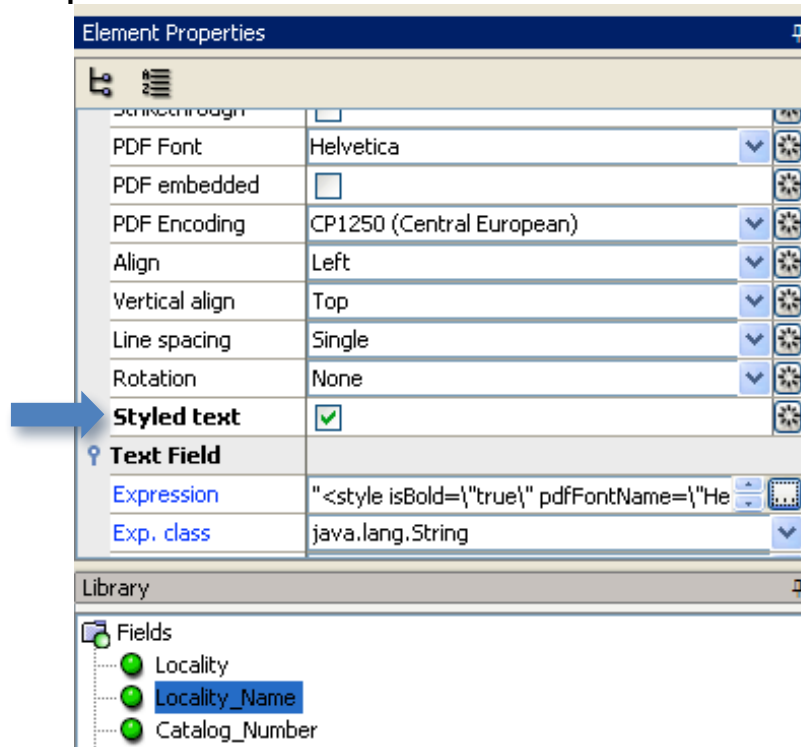"<style isBold=\"true\" pdfFontName=\"Helvetica-Bold\">"+$F{X}+"</style>"

For italicized text:

"<style isItalic=\"true\" pdfFontName=\"Helvetica-Bold\">"+$F{X}+"</style>"

For underlined text:

"<style isUnderline=\"true\" pdfFontName=\"Helvetica-Bold\">"+$F{X}+"</style>"

Be sure to check "Styled Text" in Element Properties for the fields to display correctly in the report.


NOTE: A bug within the iReport software prevents the mixed concatenation of expressions that use ampersands (in this case, the expression will display as basic html when running the report in Specify). A Scriptlet called escapeForHtml can correct the problem. See the section called "Further Insight into Scriptlets" for more details on this fix.
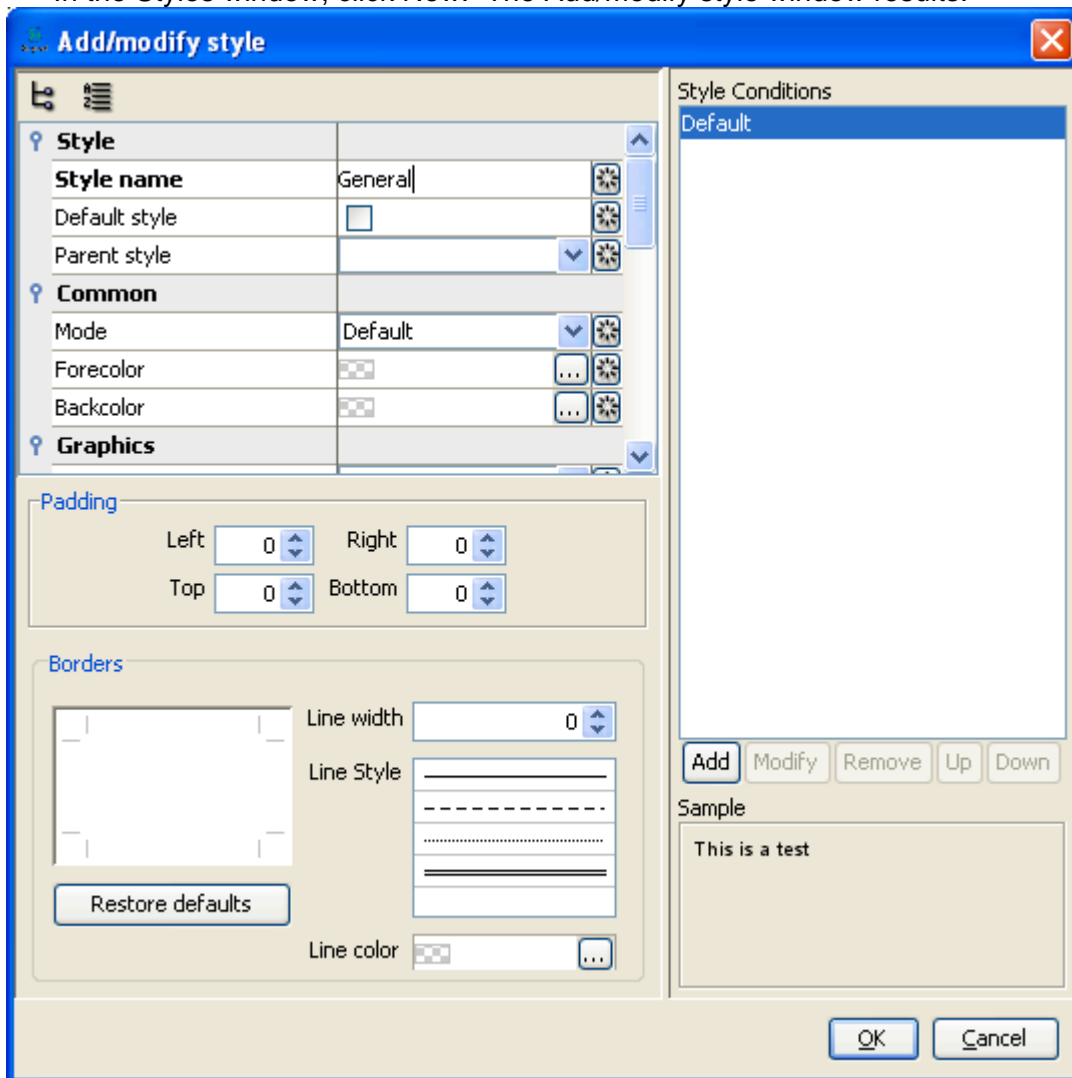
Adding a Style

Instead of spending time on selecting different style elements and properties for each individual field in your report, you can create styles to easily reuse or set as the default in the report.

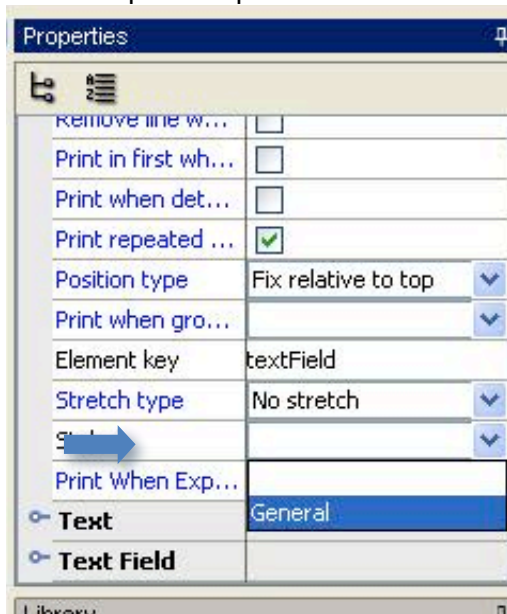- Click on Format in the top toolbar and select Styles.
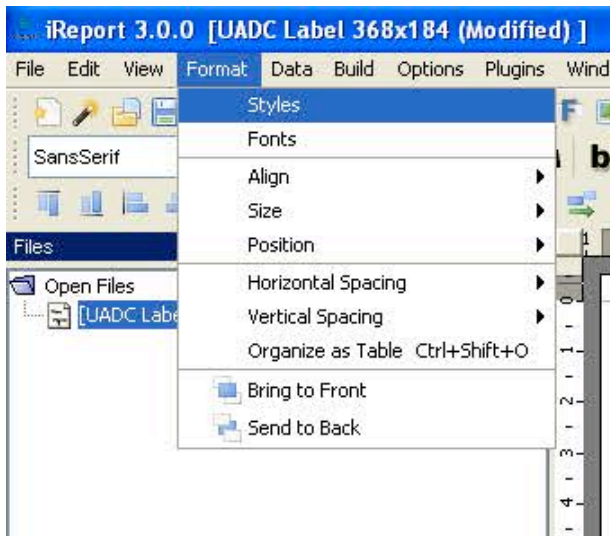
• In the Styles window, click New. The Add/modify style window results.

- Change and add style properties to your liking – remember to give a Style name – and click OK.
- The new style should now be added to the Styles window. If you wish this style to be the report default, highlight it and click the Set as Default button. NOTE: Changing the default will not change the style of fields already in place on the report template, so it should be set in the beginning of creating a report.

Styles		
Style Name	Default	New
General	Yes	Modify
		Set as Default
		Delete
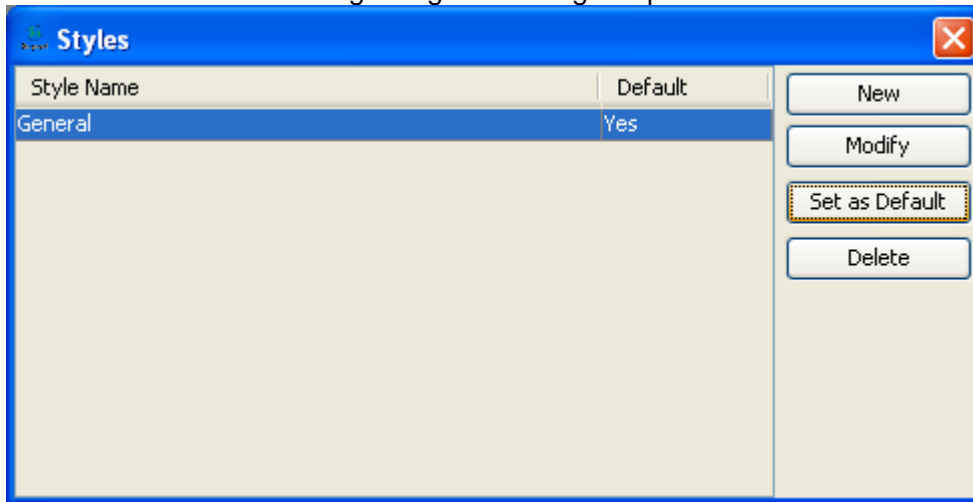
- If you intend to use multiple styles in the same report, highlight a field that is placed on the report template and select from the Style dropdown in the Properties pane.

Properties

Remove line w...	☐
Print in first wh...	☐
Print when det...	☐
Print repeated ...	☑
Position type	Fix relative to top
Print when gro...	
Element key	textField
Stretch type	No stretch
St...	
Print When Exp...	
Text	General
Text Field	

Library

- Save the report.

Adding Images to Reports and Labels

Unlike word processor documents, iReport templates call images from a location on the computer; images cannot be pasted into the report template. For this reason, it is important to consider whether the report will be run on only one computer or multiple computers. If the report is going to be used on only one computer, then the image is most easily browsed and selected directly from within iReport.

If the report will be used on more than one computer, the image should be defined in two places (which ultimately eases setting image locations on multiple computers). The image location is designated in Specify and the image name is designated in iReport with the addition of a parameter.

Furthermore, by adding an extra parameter, there is the added capability of selecting a different image whenever running a report in Specify. Those directions are covered in Part 3 of this section and are NOT necessary for users who only ever want to use one image in a given report.

Images in Reports on a Single Computer

Click the Image tool button [icon] and size the image box on the report.
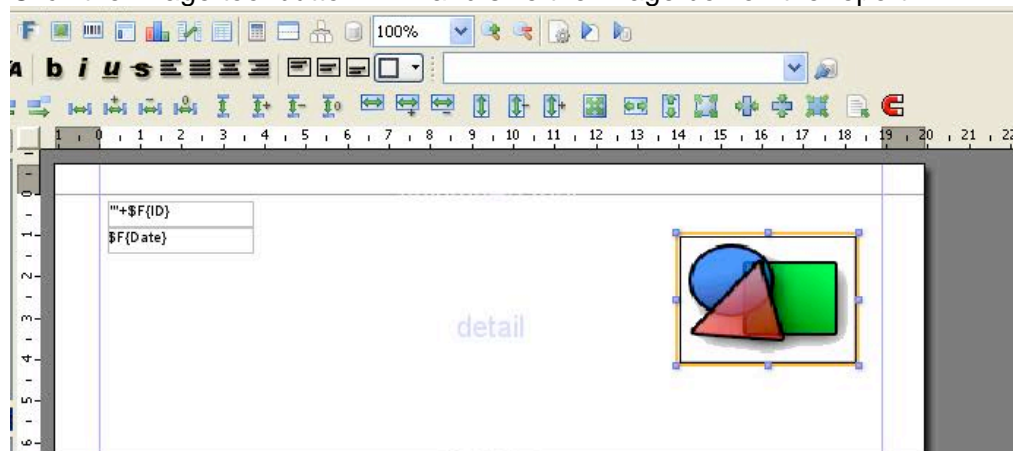
- Right-click the image box and select Properties. In the Properties window, change the tab to Image.
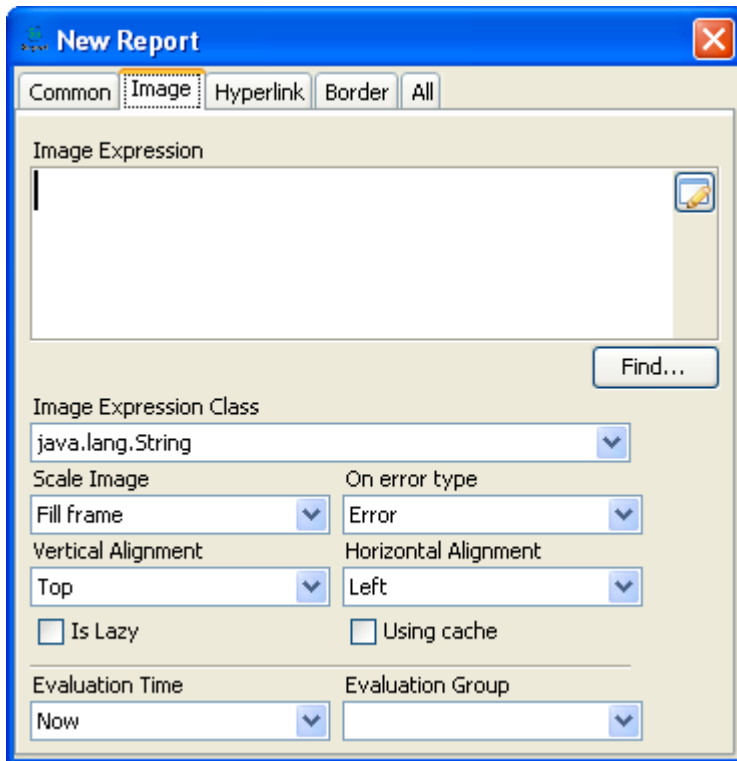
- Under the Image Expression text box, click Find and select the specific image file location on your computer.
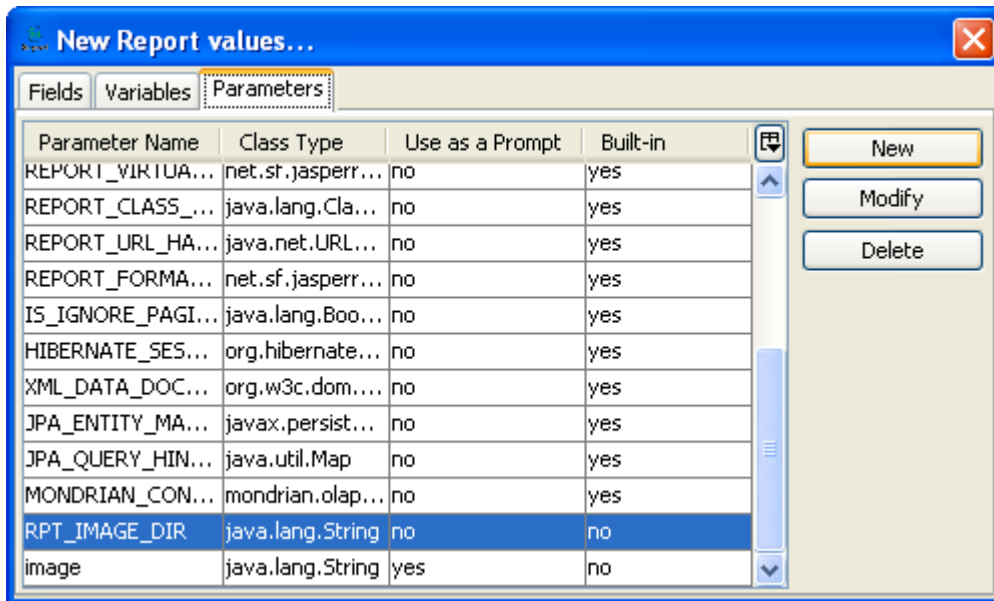
Images in Reports on Multiple Computers

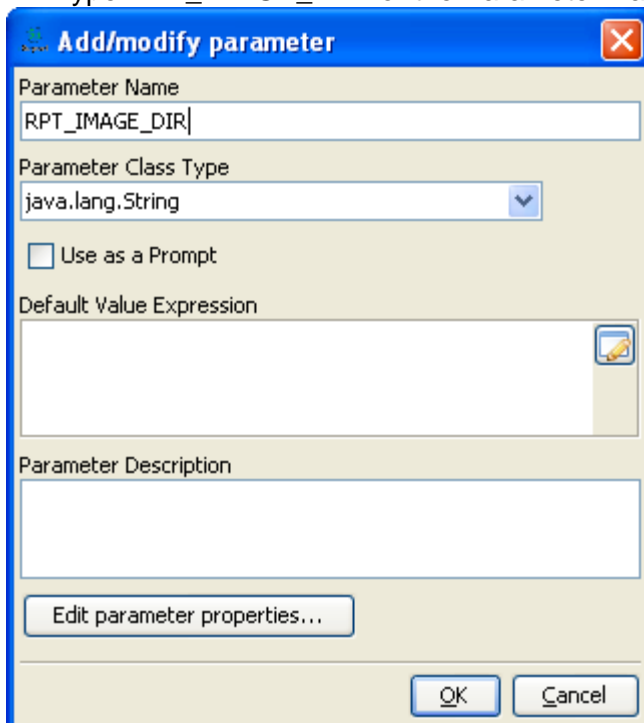**Part 1: Designating the image name and parameter**
- Follow the same directions as for a single computer, but leave the Image Expression blank for now instead of clicking Find.
- Close Properties.
- Click View in the toolbar and select Parameters.
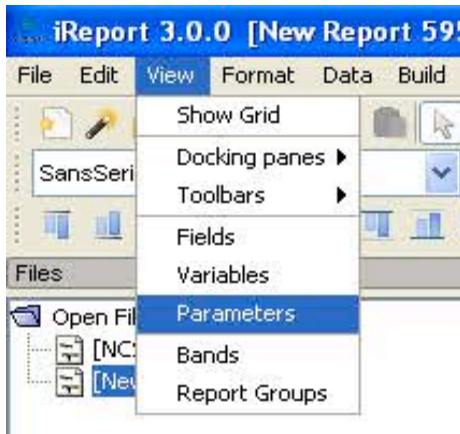
- Click New.

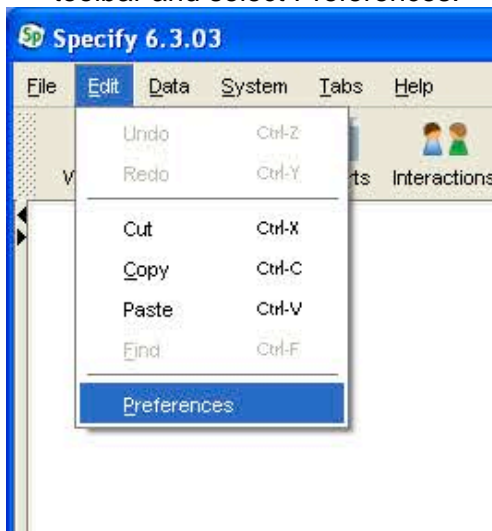- Type RPT_IMAGE_DIR for the Parameter Name.

- Click OK and Close Parameters.
- Again, right-click the image icon on the report and select Properties..
- Under the Image tab, click the Expression Editor button located next to the Image

  Expression text box.
- In the Expression Editor, use the following expression (inserting your own image file
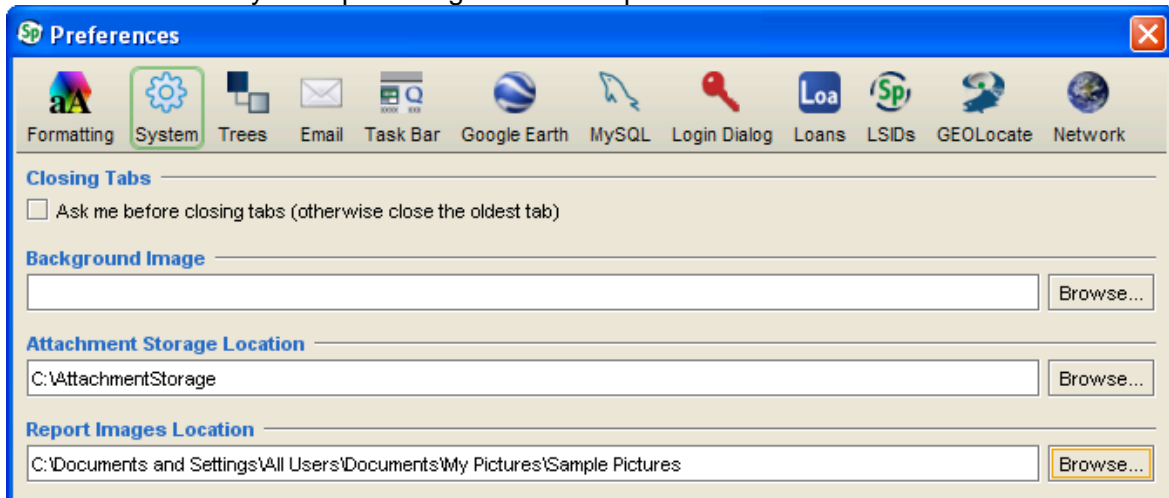 name with extension where it says "filename.jpg"):

Expression editor...

```
$P{RPT_IMAGE_DIR} + "/" + "filename.jpg"
```
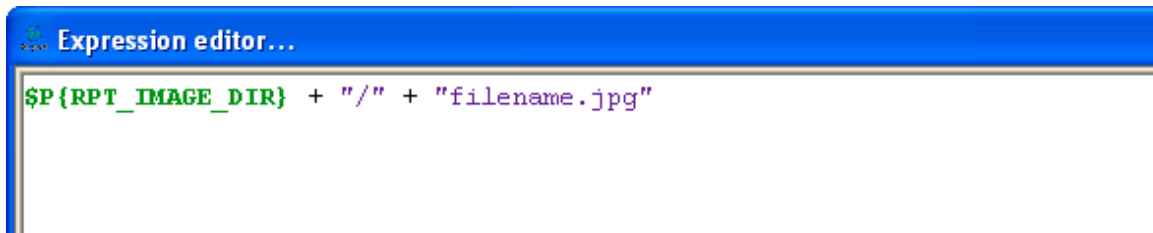
- Apply the expression and Save the report.

Part 2: Designating the image location
- To designate the Reports Image Location, open Specify. Click Edit in the topmost toolbar and select Preferences.

Specify 6.3.03

File Edit Data System Tabs Help

Undo	Ctrl-Z
Redo	Ctrl-Y
Cut	Ctrl-X
Copy	Ctrl-C
Paste	Ctrl-V
Find	Ctrl-F
Preferences	

- Change the view to System. Under Report Images Location, browse for the standard location where your report image file will be placed.

Preferences

Formatting System Trees Email Task Bar Google Earth MySQL Login Dialog Loans LSIDs GEOLocate Network

Closing Tabs
☐ Ask me before closing tabs (otherwise close the oldest tab)

Background Image
[   ] Browse...

Attachment Storage Location
C:\AttachmentStorage   Browse...

Report Images Location
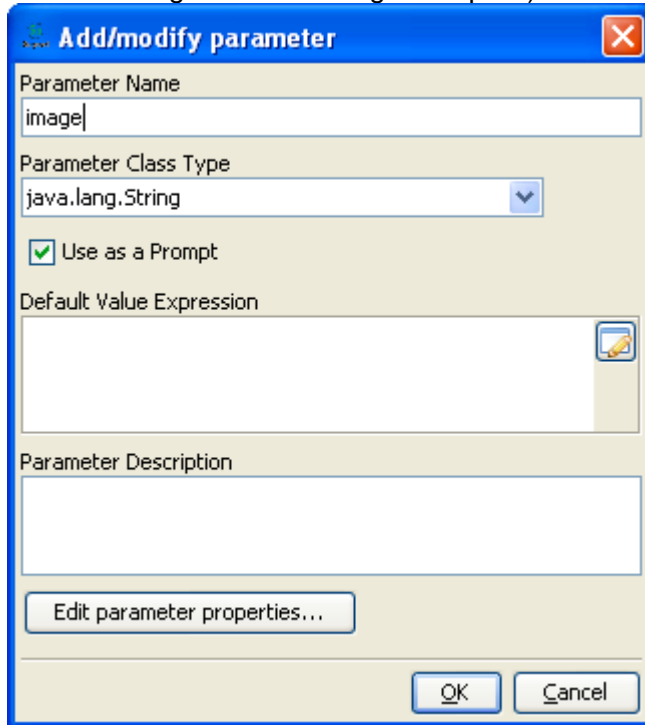C:\Documents and Settings\All Users\Documents\My Pictures\Sample Pictures Browse...

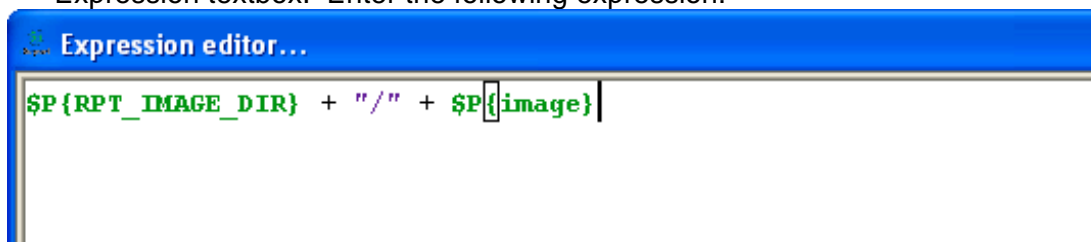- Save the change and the image should be ready to run in your report.

Part 3: To allow the selection of an image at the time of running the report

This extra step allows you to select your label upon running the report in Specify instead of designating just one image to be used every time.

- Complete the instructions in Part 2 (for multiple computer use).
- Open iReport. Click View in the topmost toolbar and select Parameters. Click New.
- Name the Parameter 'image' for example. Check 'Use as a Prompt'. (In this window, you can also set a default image filename that will be used if you do not designate a different image when running the report.)

- Click OK and close Parameters.
- Right-click the image icon on the report and select Properties.
- Under the Image tab, click the Expression Editor button located next to the Image Expression textbox. Enter the following expression:

- Apply the expression and save the report.
- Open Specify and go to Reports.
- Run Report. When the Report Settings window appears, there should now be two tabs: Query Criteria AND Report Parameters.
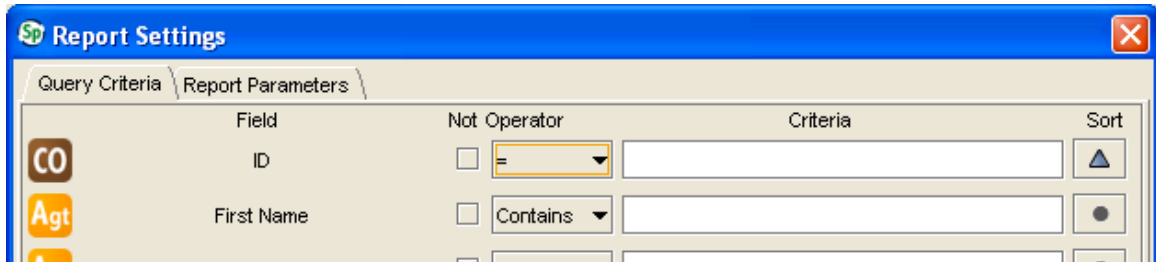
- Change the tab to Report Parameters. Type the image filename that you want to use for the report. (Remember, the image must be located in the same directory as set in Preferences.)
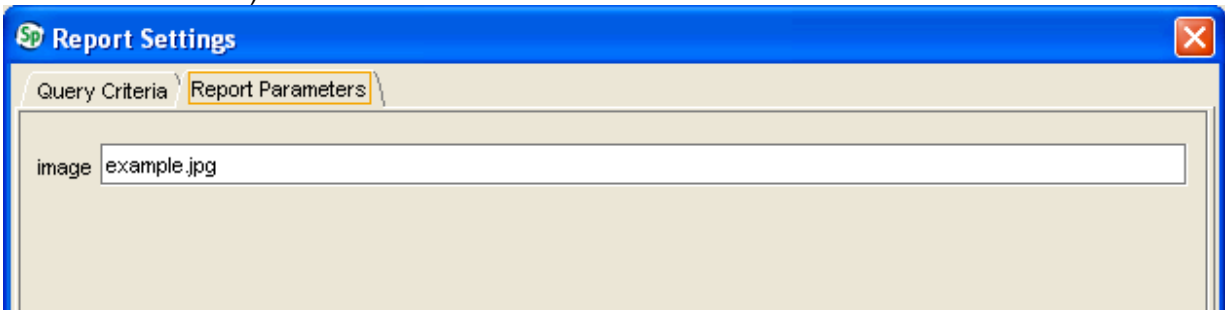
- Click OK and the report will run with the selected image.

Barcodes

Adding a barcode to a label or report is a fairly straightforward process as long as you know the capabilities of the barcode scanner. Any barcode that is available in iReport can be used on a label or report and run in Specify. The value of the barcode is based on a Specify field, usually catalog number or invoice number.

Note that QR Codes are not available for use in 3.0.0 version of iReport that Specify currently uses. A plugin is available for this use but requires a licensing cost.

- In iReport, click the Barcode tool button and size the barcode box on the report.
- Right-click on the barcode once it is in place. Select Properties.
- Change the Properties tab to Barcode.

- Select a type of barcode by choosing from the Type dropdown (see the next section for information about barcode types and compatibility).
- To apply a field to the barcode, click the Expression Editor button next to the Barcode Expression textbox.
- In the Expression Editor, select and add a field from the list of available fields. An example is shown below.

- Apply the expression and close the Properties window. Save the report.

NOTE: Occassionally, in iReport, the barcode image will have a text overlay that says 'Barcode Error'. The barcode should still run correctly in Specify and can be scanned with an appropriate barcode scanner.

Barcode Type Compatibility

There are certain barcode types that iReport cannot put into generic AlphaNumeric String format (for example, Catalog Numbers or Accession Numbers):

(A) i.e. generates an error in the creation of the barcode from within iReport.
2of7, 3of9, Bookland, Codabar, Code128C, Code39, EAN13, Int2of5, Monarch, NW7, Std2of5, UCC128, UPCA, USD3, USD4

(B) In revision, some barcodes generate an error from within iReport, but the resulting report turns out fine.
These are the following: 2of7, 3of9, Code128C, Code39, Monarch, NW7, Std2of5, USD3, USD4. Also, I tested these with only numeric values, even though some of them do not process alphanumeric strings. So, some of these barcodes may not work in those circumstances, but it is not a general error but rather simply an incompatibility. The flip side of this list (i.e. the barcodes that cause an error in the filling of the report from within Specify): EAN13, int2of5, UCC128, UPCA.

Report Groups

Groups allow you to organize the records of a report to better structure the report content. Groups are especially valuable when making a loan invoice. When a group is defined by an expression, a new group begins when the expression value changes (**e.g. when a loan number changes, a new invoice begins for the new loan number**). Moreover, Groups are useful for making certain specimen labels and reports as well. For instant, one application has been to list all associated Collection Object records for a single Taxon name – with the list of Collection Objects starting over with each new Taxon name.

- To implement a Report Group in iReport, click View and select Report Groups.
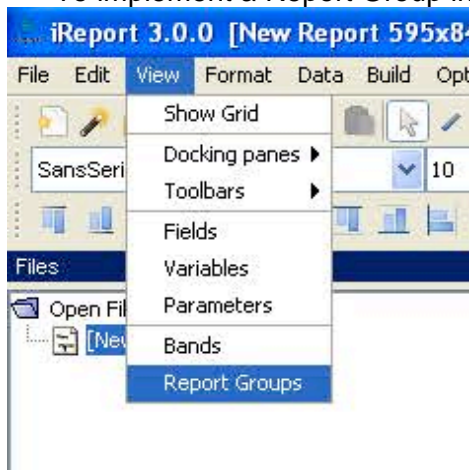
- In the New Report Groups window, click the New button. The Add/modify group window will then open.

- Enter a Group Name (e.g. Loan Group).
- To define the Group expression, click the Expression Editor button next to the Group Expression textbox and select a field from the list of Specify fields available.

- Apply the expression.
- Select other features in this window--such as start on a new page or column with each new value for the Group Expression. A finished example is shown below for reference.

- Click OK at the bottom of the Add/modify group window and close the groups.
- New Group Header and Group Footer bands should now be visible in the report template.

Further Insight into Scriptlets

Scriptlets perform special Java functions that pull data from a Specify database and translate it into a given format in a report or label. Scriptlets are predefined in the Specify 6 code and provide for a range of possible formatting issues that a collection might come across when making labels and reports. Directions for use and a list of existing scriptlet functions in Specify 6 can be found at http://files.specifysoftware.org/SpecifyScriptlet.html. There are some that are not currently on the list, including several that are explained in this document.

Note: When using scriptlets in a report, make sure that the Scriptlet Class in Report Properties (Edit>Report Properties) is set to *edu.ku.brc.specify.config.Scriptlet* (see below).
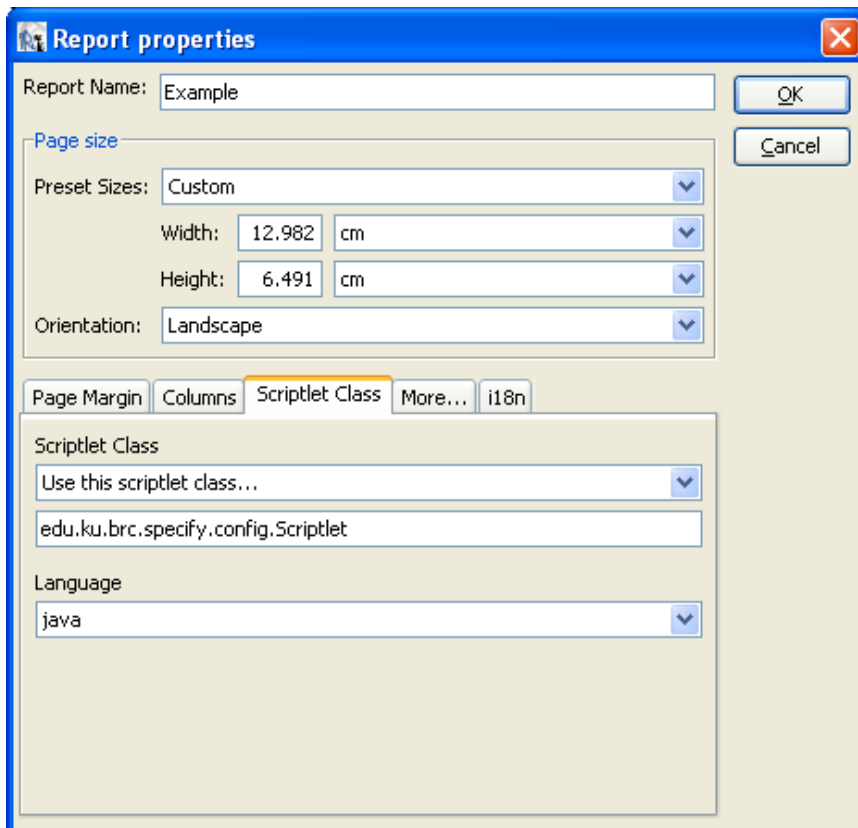
Scriptlets must be added to the Expression Editor in the following format:
((edu.ku.brc.specify.config.Scriptlet)$P{REPORT_SCRIPTLET}).scriptletName(required fields)

The following examples are common use-case scenarios or further explanation for some existing scriptlets:

Expression for formatted Latitude/Longitude and direction characters:
To display latitude and longitude in the original format (as they are shown in Specify) and with direction characters (N, E, S, W), you would use the .formatLatLon and .getDirChar Scriptlets. The query fields necessary for these two scriptlets are latitude1, longitude1, and original latitude longitude unit.
((edu.ku.brc.specify.config.Scriptlet)$P{REPORT_SCRIPTLET}).formatLatLon($F{Latitude1}, $F{Original_Latitude_Longitude_Unit}, true) +

((edu.ku.brc.specify.config.Scriptlet)$P{REPORT_SCRIPTLET}).getDirChar($F{Latitude1}, true)
+ " " +
((edu.ku.brc.specify.config.Scriptlet)$P{REPORT_SCRIPTLET}).formatLatLon($F{Longitude1},
$F{Original_Latitude_Longitude_Unit}, false) +
((edu.ku.brc.specify.config.Scriptlet)$P{REPORT_SCRIPTLET}).getDirChar($F{Longitude1},
false)

The above expression displays as: 32° 38' 10.00000"N 88° 16' 28.00000"W

To set Latitude and Longitude to appear blank when the value is null, follow these steps:
1. In the left panel of iReport, right-click Variables and select "Add…" and choose Variable.
2. In the Variable form, use these settings:
    o The name should be either "Latitude" or "Longitude." Each needs its own variable.
    o Variable Class Type - String
    o Calculation Type - Nothing
    o Reset Type - Report
    o Increment Type - None
3. Set the Variable Expression to one of these two, depending on whether the variable is Latitude or Longitude:
    o ((edu.ku.brc.specify.config.Scriptlet)$P{REPORT_SCRIPTLET}).formatLatLon($F{Latitude1}, $F{Original_Latitude_Longitude_Unit}, true) + ((edu.ku.brc.specify.config.Scriptlet)$P{REPORT_SCRIPTLET}).getDirChar($F{Latitude1}, true)
    o ((edu.ku.brc.specify.config.Scriptlet)$P{REPORT_SCRIPTLET}).formatLatLon($F{Longitude1}, $F{Original_Latitude_Longitude_Unit}, false) + ((edu.ku.brc.specify.config.Scriptlet)$P{REPORT_SCRIPTLET}).getDirChar($F{Longitude1}, false)

4. The Initial Value Expression should be ""
5. In the field where you want the latitude and longitude, the expression will look like this:
   - ($V{Latitude}==null?"":$V{Latitude})+", "+($V{Longitude}==null?"":$V{Longitude})
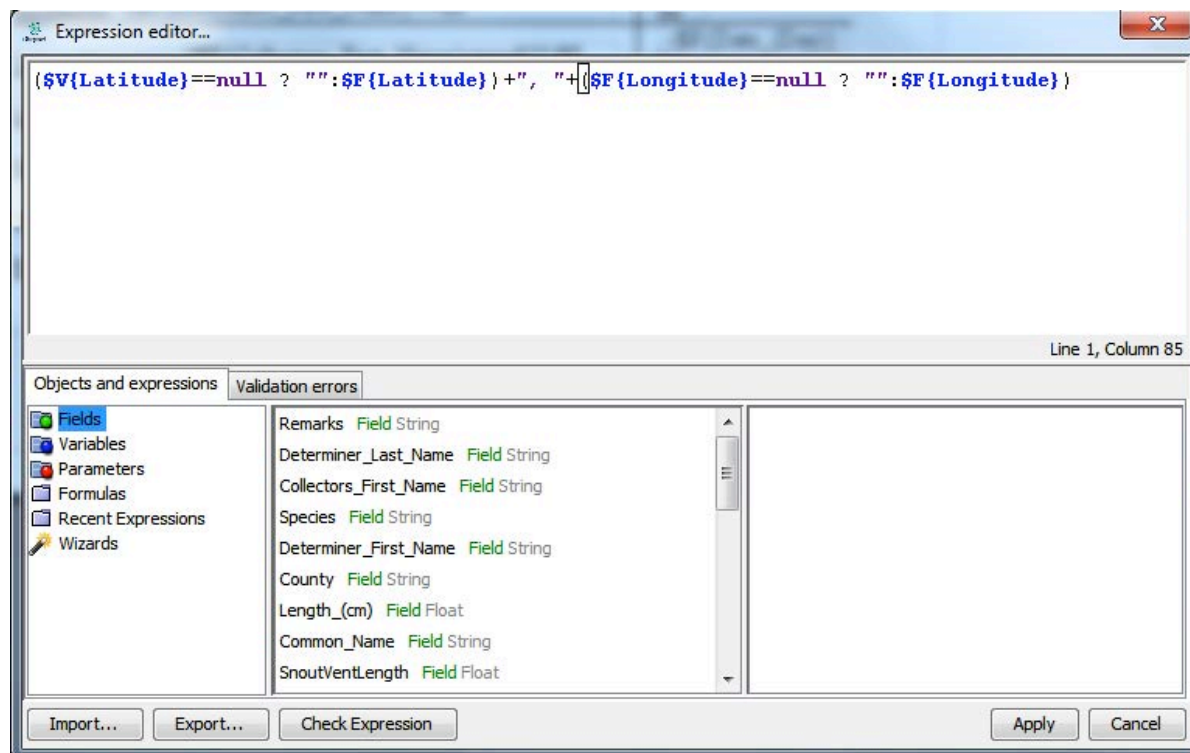
Remember to edit the field's properties and ensure that the Text Field Expression Class is set to String, or you will get an error when you run the report. There are screen shots of creating a Variable in the next section of this document, if you run into trouble setting up the Lat/Long variables.

Some Commonly Used Scriptlets

Scriptlet for mixed concatenation expressions using ampersands:

DON'T FORGET TO CHECK THE STYLED TEXT BOX!!!!!!!!!!!!

```
 ((edu.ku.brc.specify.config.Scriptlet)$P{REPORT_SCRIPTLET}).escapeForHtml($F{Author})

"<style isItalic=\"true\" pdfFontName=\"Helvetica-Bold\">" +
($F{Genus}==null?"":((edu.ku.brc.specify.config.Scriptlet)$P{REPORT_SCRIPTLET}).escapeForHtml($F{Genus}))
+ " " +
($F{Species}==null?"":((edu.ku.brc.specify.config.Scriptlet)$P{REPORT_SCRIPTLET}).escapeForHtml($F{Species}))
+ "</style>" +
($F{Species_Author}==null?"":((edu.ku.brc.specify.config.Scriptlet)$P{REPORT_SCRIPTLET}).escapeForHtml($F{Species_Author}))
+ " " +
($F{Variety}==null?"":" var. "+"<style isItalic=\"true\" pdfFontName=\"Helvetica-Bold\">"  +
$F{Variety}+"</style>") + ($F{Variety_Author}==null?"":$F{Variety_Author})
+ " " +
($F{Subspecies}==null?"":" subsp. " + "<style isItalic=\"true\" pdfFontName=\"Helvetica-Bold\">"
+ $F{Subspecies}+"</style>") + ($F{Subspecies_Author}==null?"":$F{Subspecies_Author})
```

Scriptlet for primary collector:
((edu.ku.brc.specify.config.Scriptlet)$P{REPORT_SCRIPTLET}).getFirstCollector($F{Catalog_Number})

Scriptlet for secondary collectors:
((edu.ku.brc.specify.config.Scriptlet)$P{REPORT_SCRIPTLET}).getSecondaryCollectors($F{Catalog_Number})

Scriptlet for calculating length of loan:
((edu.ku.brc.specify.config.Scriptlet)$P{REPORT_SCRIPTLET}).dateStringDifference($F{LoanDate}, $F{CurrentDueDate})

To retrieve agents by Loan Agent Role, use the following scriptlet:

((edu.ku.brc.specify.config.Scriptlet)$P{REPORT_SCRIPTLET}).getByLoanAgentRole($F{Loan Number},"agent role","agent.field")

"agent role" is the role of the agent in the Loan that you are using. For example, if you are using the scriptlet for the agent who is the recipient of the loan, the role will probably be Borrower. Be sure to compare the loan record with the report to make sure you are using the correct role.

"agent" refers to the table in which the field in question is located. For address fields, the table would be "address," not "agent." *Make sure that the field names match the ones in the schema EXACTLY.* To check this, go to Schema Configuration, select the agent or address table (depending on which field you are checking) and look at the Fields box (below the Tables box) to find the name of the field. Some examples of fields you might use are agent.firstName, agent.lastName, address.address, address.city, and address.state. Be sure to compare the loan record with the report to make sure you are using the correct fields.

*Note: if you use this scriptlet, you do not need to include the Loan Agent fields it calls for in the query. Also, this scriptlet only works for agents added to a Loan record under Loan Agents. It will not work for agents in Shipped To or Shipped By.

To format Preparations to match the format on the default invoice:
($F{Quantity}==null?"":$F{Quantity}+"").toString() + " " +
($F{Prep_Type}==null?"":$F{Prep_Type}+"") + " of " +
((edu.ku.brc.specify.config.Scriptlet)$P{REPORT_SCRIPTLET}).calcLoanQuantity($F{Count},
$F{Quantity_Returned}, $F{Quantity_Resolved}) + " " +
($F{Prep_Type}==null?"":$F{Prep_Type}+"")

This will print preparations in this format (under Specimen Count):

UNM #	TAXON & LOCALITY	SPECIMEN COUNT
10046	*Pseudognaphalium macounii* Rio Arriba, New Mexico, USA, Brazas Canyon, east of Corkins Lodge. Field No.:000010046 Date: 9/13/1953	1 Sheets of -1 Sheets

Variables

If you're just trying to say how many records are on an invoice, try adding the field "NumberOfRecords) before making a variable. If it worked, it turns out to be a way easier solution then messing with this stuff.

Variables are objects used to store the results of calculations such as subtotal and sums. In this section, two examples are given of creating two different variables that are commonly used in Loan Reports – but they can be of use elsewhere. Other variables are built into iReport, but are not modifiable by the user. Built-in variables are listed in the Library pane and can be dragged to the report. See below for the built-in variables that are available.
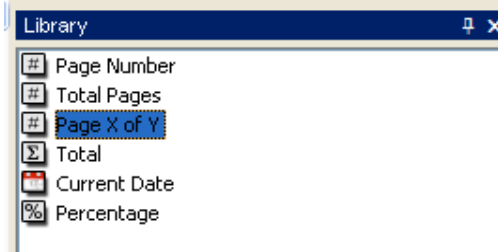
Calculating a Distinct Count

For example, a user may want a count of the species being loaned to appear on a loan invoice. Follow these steps:

- In the Document structure pane of iReport, right-click "Variables". Hover your mouse over "Add" and click "Variable"(shown below).
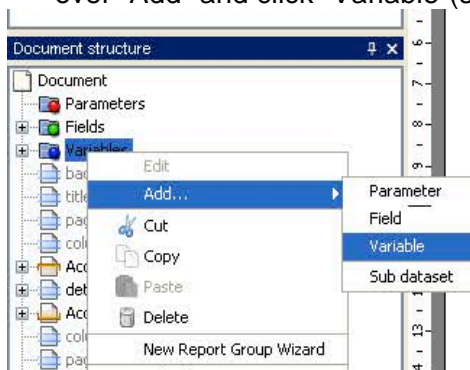
- The "Add/modify variable" window allows you to define your variable. Use the given criteria in the listed fields and use the screen capture as reference.
  - o Variable Class Type: java.lang.Integer
  - o Calculation Type: Distinct Count
  - o Reset Type: Report
  - o Reset Group: leave blank, *unless* you are using a Report Group and want only one group to be used for the calculation.
  - o Increment Type: None
  - o Increment Group: leave blank, *unless* you are using a Report Group to specify when the variable value has to be evaluated.
  - o Variable Expression: Click the Edit button next to the text box and select the field that should be counted distinctly. In this scenario, the Taxon Full Name is being evaluated.

- Click OK. Once the Variable has been created, it will be available under "Variables" in the Document structure pane. Drag the variable onto your report as if you were adding a field to the report.

Calculating a Sum

A user may want to calculate the total specimens being loaned to appear on a loan invoice.

- Follow the same directions as given above for a distinct count *with the exception of the changed criteria for Calculation Type and Variable Expression.* Use the screen capture below for reference.
  - Calculation Type: Sum
  - Variable Expression: click the Edit button next to the text box and select the field that should be calculated for a sum. In most cases, the Count field (or its equivalent) from Loan Preparations is evaluated for the sum of specimens being loaned.

Labels: Manually changing page orientation to portrait (work-around for iReport bug)

An active iReport bug does not allow page orientation to be set as portrait when the page length is greater than the height – iReport automatically changes the orientation to landscape. This is problematic for some user's printing requirements, especially in regard to labels. To manually change the orientation to portrait, follow these directions:

- When the label is in its final draft, check the Page Size in Report Properties (Edit > Report Properties). Make sure the dimensions are correct even though the orientation is incorrect.
- Open Specify and go to System, located on the top toolbar. Open Resource Import/Export from the System dropdown.
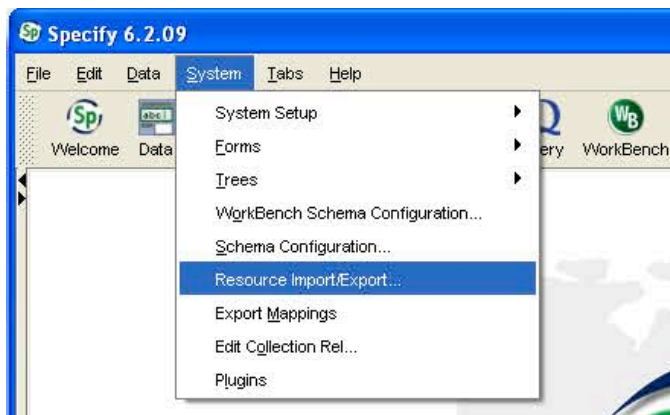
- Make sure that any changes in Specify have been saved and click Continue to the dialog below.
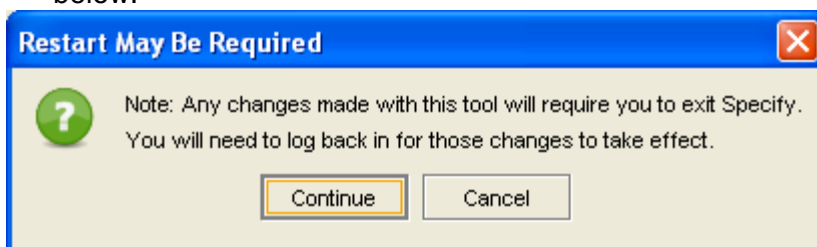

- Reports are usually located under the Discipline level, so change the pick list to "Discipline" and change the tab to "Report Resources" to see your report.
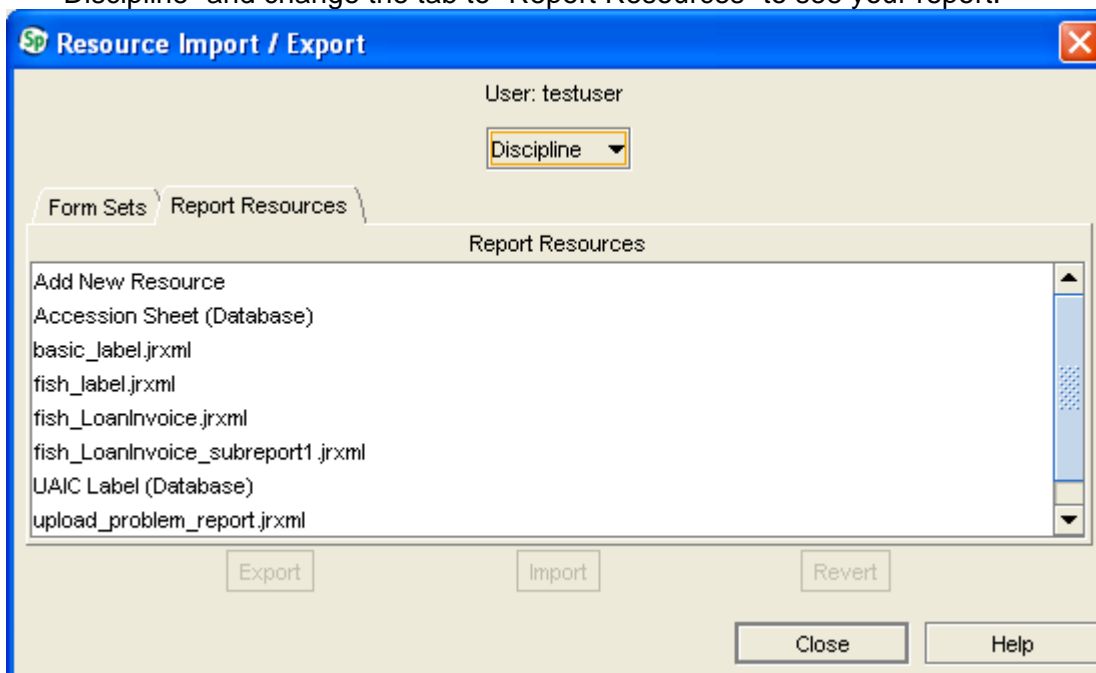

- Highlight your report or label and click the Export button. Export the report or label to a location on your computer as a zipped file by adding the .zip extension to the filename (e.g. Example.zip).

- Go to the zipped file on your computer and unzip it. The unzipped folder will contain three xml files.
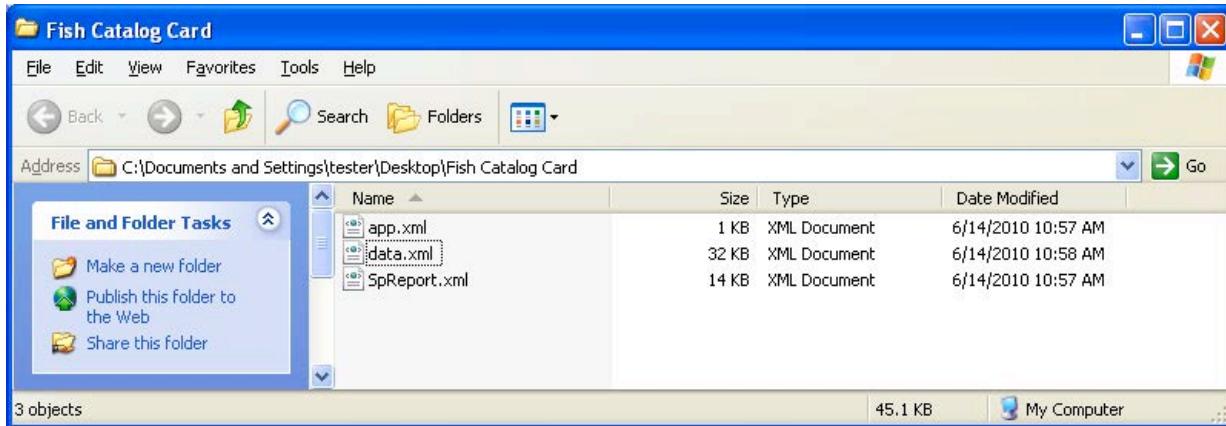
- Open the data.xml file with a word processor such as Notepad in order to edit it. (On Windows, right-click data.xml and select "Open With" Notepad.)
- The file document will look something similar to the screen capture below. Find orientation="Landscape", located close to the top of the page.
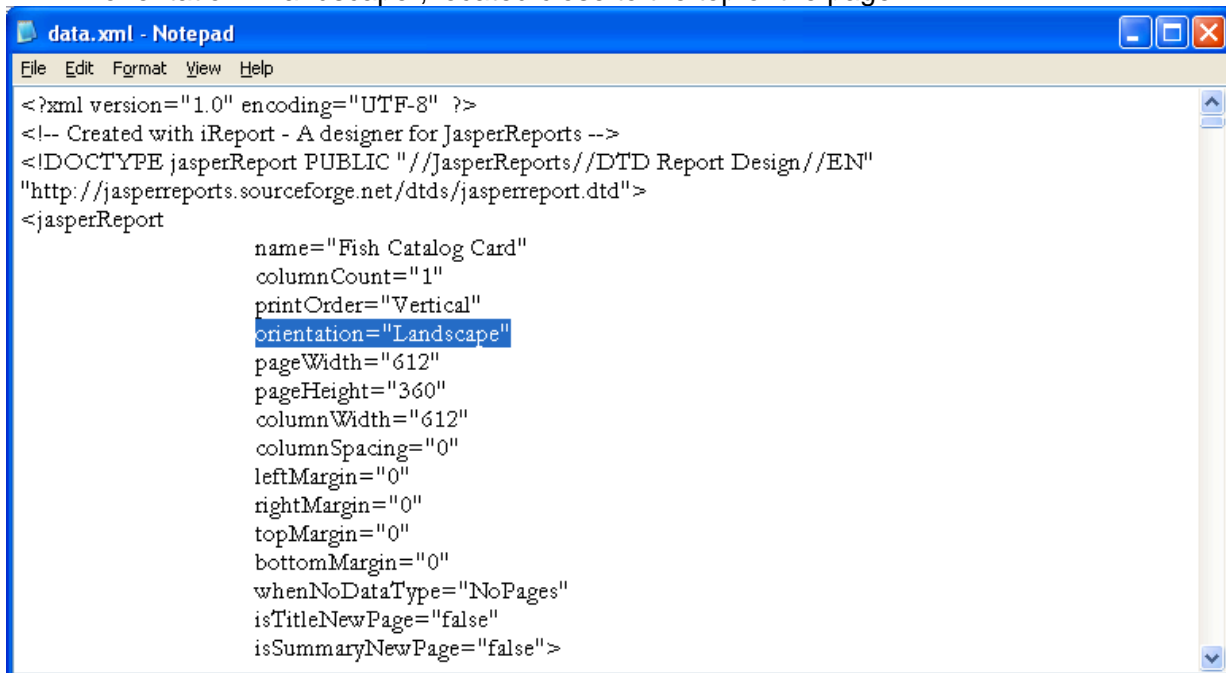
- Change "Landscape" to "Portrait". Save your changes.
- Rezip the entire folder.
- In Specify, go to System > Resource Import/Export and import the zipped file to Discipline level, under the Report Resources tab.

NOTE: Once the orientation has manually been changed, do not edit the orientation for the label from within iReport.

Another thing you might have to do:

When you run the report in Specify, click Print and go to the printing options. Mess around with the orientation and size there (make the label just under 2 inches in iReport if the printer has it set to be 2 inches high OR try making the label print upside down by making the orientation be Portrait x 180)

Tips, Tricks, and Workarounds

Disappearing text boxes:

If text boxes are visible on the report template but not showing up when the report is run in Specify, check the font size and text box size. The usual culprit is height: the text box should have a height at least three pixels greater than the point size of the text entered in the box.
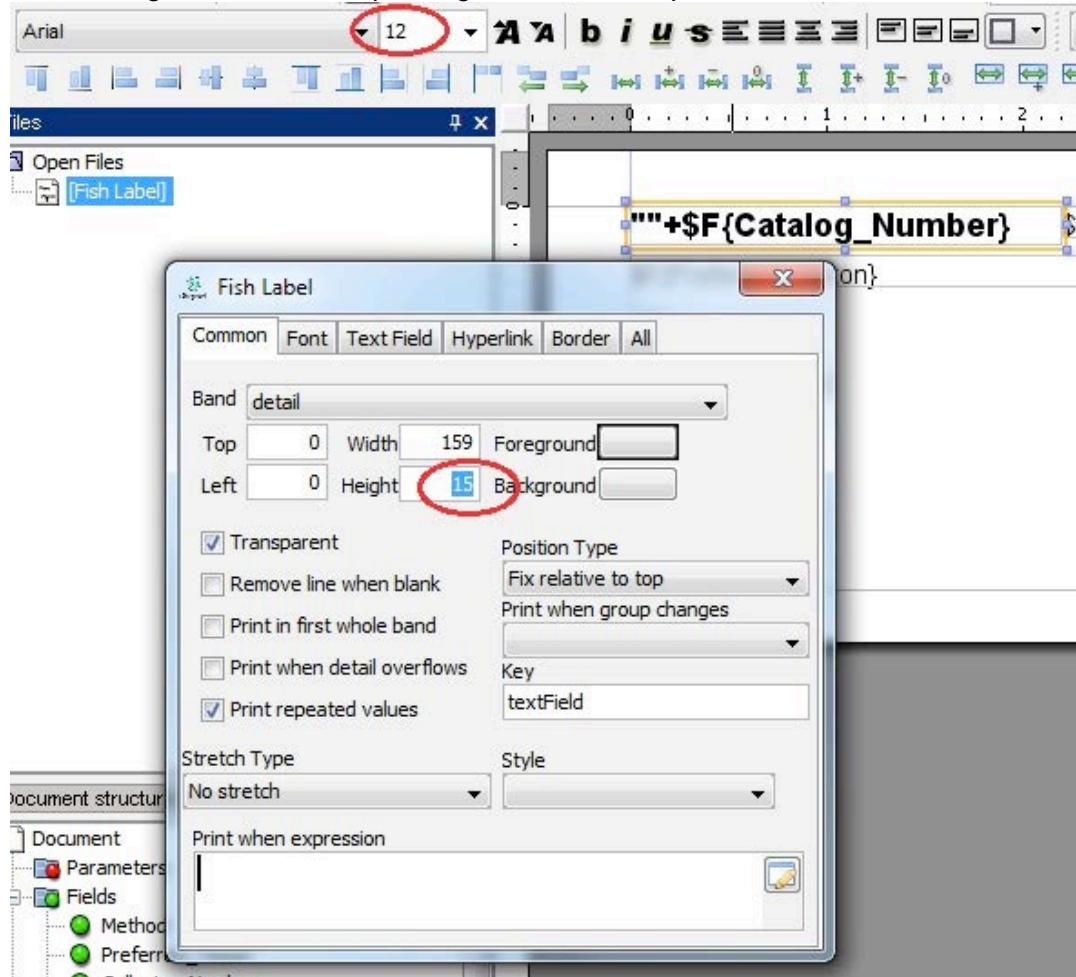
For example, if the text is Arial 12 pt. font, the text box should be at least 15 pixels tall for one line of text. It is not necessary to add three pixels for each line of text if the box has multiple lines, but it is a good idea to leave some extra room if possible.

Issues with changing line thickness and text box size in the Properties pane:

Due to a bug, iReport sometimes does not change graphic line thickness or text box size when these numbers are entered in the Properties pane on the right side of the screen. To change line thickness, set the line thickness (the default value is 0) to 1, and then re-set it to the desired line thickness.
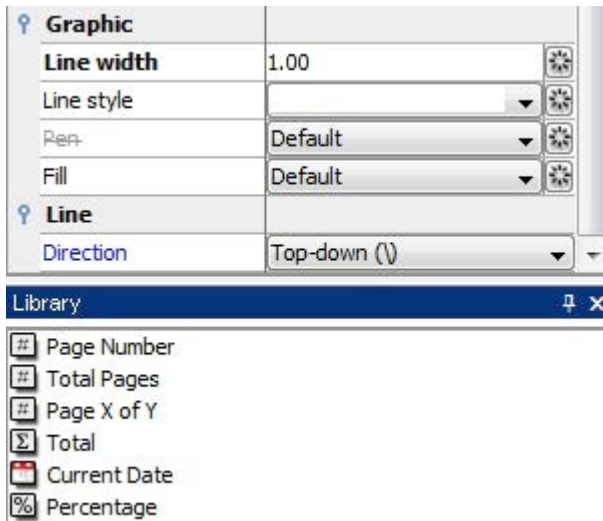
If iReport is not saving changes to text box size, try opening the Properties pop-up window (right-click the text box and select Properties) and changing the numbers that way. Restarting iReport may be required if it is still impossible to make changes.

Resizing the page, columns, column spaces, and report bands:
When making labels, it is necessary to match the sizing and spaces exactly to a sample page, which may be printed from MS Word, Specify 5, etc. Unfortunately, iReport's Report Properties window is not as accurate as is sometimes required. To get the exact size you need for the template margins, columns, column spaces, and report bands, use these methods:
- Margin width, column width, and column space width can all be adjusted one pixel at a time in the Properties pane on the right size of the iReport window.
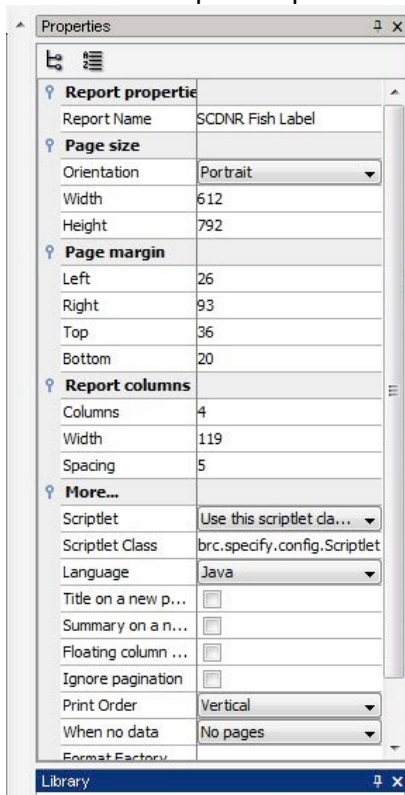
- Band height can be adjusted one pixel at a time by going to View>Bands, selecting the Detail band (or another band, if you are not using Detail,) entering a height in the box, and clicking Apply.
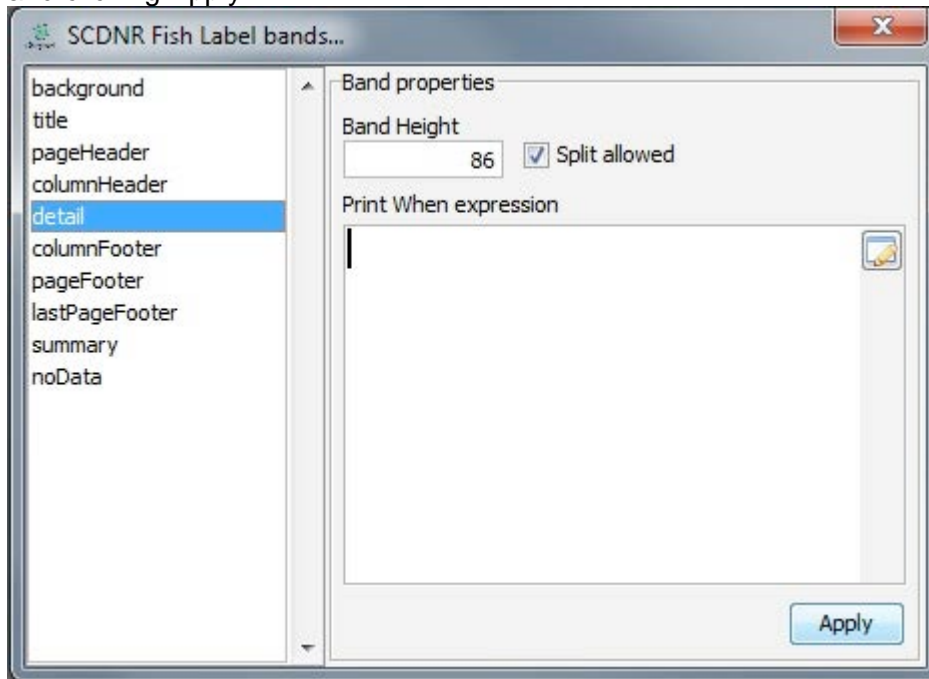
## Using Your Report or Label in Specify

Once the report has been saved in iReport, it can be used in a variety of contexts in the Specify application.
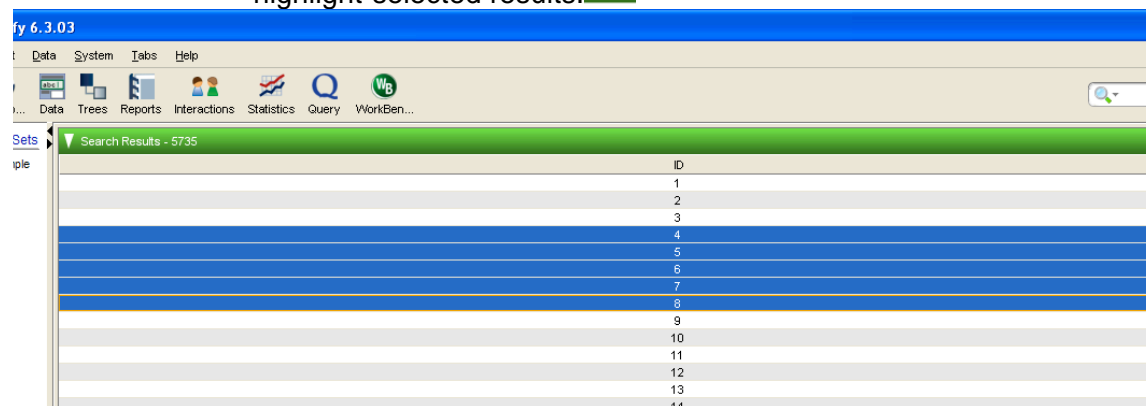
- Log into Specify.
- Click on the Report tool.
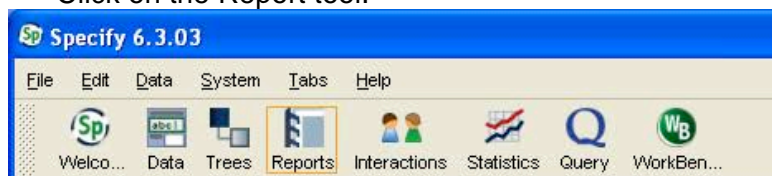
- In the Reports tool, your report or label will be placed in the left-hand side menu under the applicable heading - Reports or Labels.

- After making changes to a report in iReport, click Refresh to see changes when running the report. During the process of creating and editing a report, this Action will be repeated over and over again.

- To Run a report from the Reports tool:
1. Under the Actions heading in the left-hand side menu, click 'Run Report' to select from a list of available reports OR
2. Click directly on the report OR
3. If record sets are available, they can be dragged and dropped on a report name to run it.

In the first two scenarios listed above, a Report Settings window will appear, displaying the queried fields for the report or label. From this window, you can turn on/off sorting, change operators, and enter criteria to be searched and then displayed in the report.
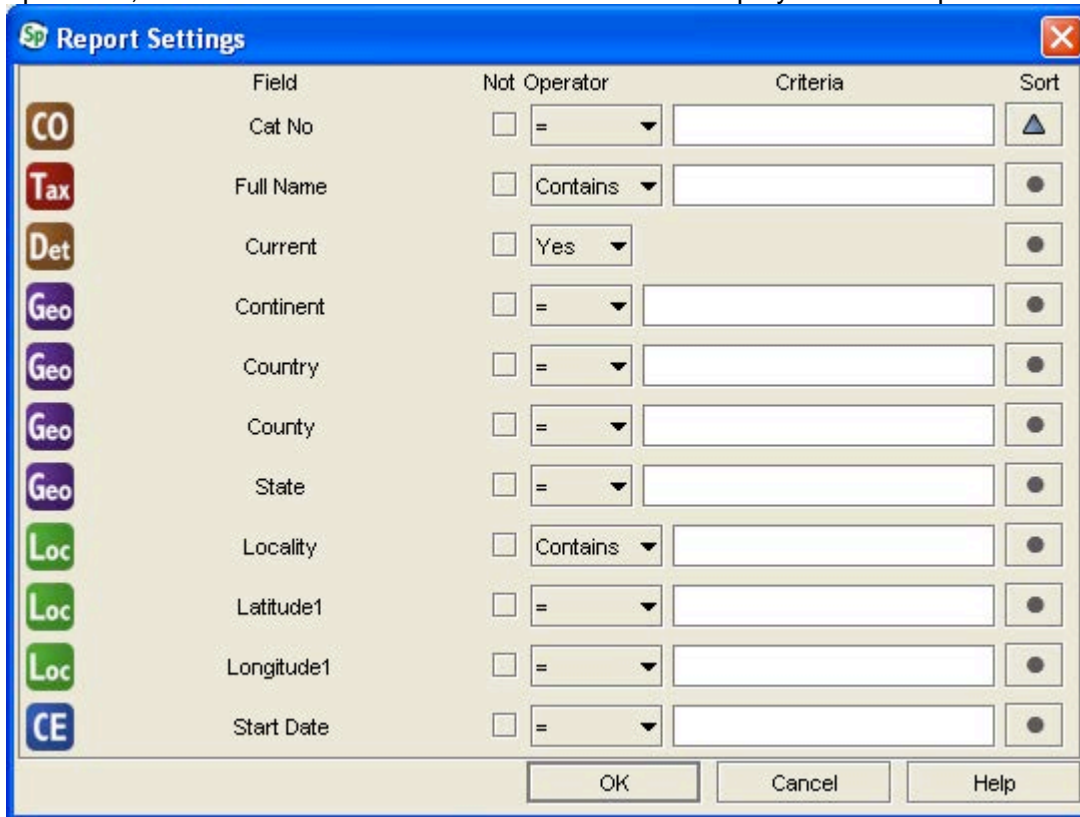
- Other contexts within Specify for running reports:
  - The Search Results toolbar contains a Report View tool that can be used for all given search results or just highlight-selected results.
  - From the Collection Object or Loan forms.
  - From the Workbench left-hand sidemenu.
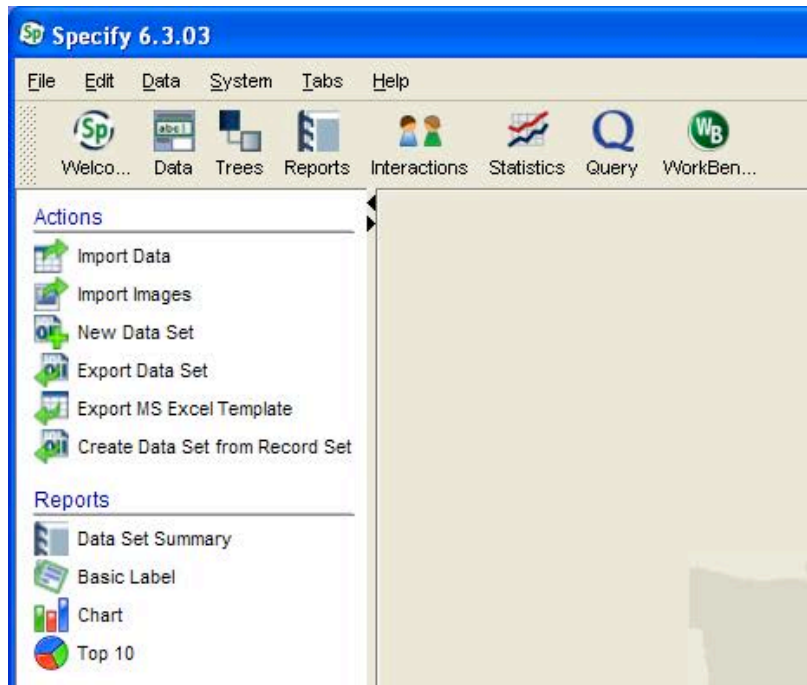
Getting rid of an extra blank page in a report

This happened to me when I was working on a label. I'm not sure why, but changing the drop down menu from 'vertical' to 'horizontal' in the 'print order' option on the 'more…' tab in Report Properties fixed the problems. I think I had to save and refresh the report a few times for the change to take place though.

Getting rid of extra punctuation when fields are null

For example, you don't want a report to look like 'South America, Paraguay , , , ' if the rest of some of the fields in the middle of the expression are null. To only make extra punctuation or even words show up only when there is information in the field, format like this: (example)

($F{Continent}==null?"":$F{Continent})+($F{Country}==null?"":", " + $F{Country})+($F{State}==null?"":", " + $F{State})+($F{County}==null?"":", " + $F{County})+($F{Locality_Name}==null?"":", " + $F{Locality_Name})+($F{Latitude1}==null?"":", " + $F{Latitude1}+"°").toString()+($F{Longitude1}==null?"":", " + $F{Longitude1}+"°").toString()

Insert your own fields or do whatever you want, but this should work perfectly.

Making dates have extra zeros

For example, you date looks like this 2012/7/9 and you want it to look like 2012/07/09. Note that the format is year/month/day here, you can switch it around as you wish. Use this expression:

"Date: " + ($F{Date_(Year)}==null?"":$F{Date_(Year)}+"").toString()
+($F{Date_(Month)}==null?"":"/"+(($F{Date_(Month)}+"").toString().length() == 2 ?
($F{Date_(Month)}+"").toString(): "0" + $F{Date_(Month)}+"")).toString() +
($F{Date_(Day)}==null?"":"/" + (($F{Date_(Day)}+"").toString().length() == 2 ?
($F{Date_(Day)}+"").toString(): "0" + $F{Date_(Day)}+"")).toString()

Making dates display full month names instead of numbers

($F{Collection_Date_(Day)}==null?"":$F{Collection_Date_(Day)}+"
").toString()+($F{Collection_Date_(Month)}==null?"":$F{Collection_Date_(Month)}+"
").toString().replace("10","October").replace("11","November").replace("12","December").replace
("1","January").replace("2","February").replace("3","March").replace("4","April").replace("5","May
").replace("6","June").replace("7","July").replace("8","August").replace("9","September")
+($F{Collection_Date_(Year)}==null?"":$F{Collection_Date_(Year)}+"").toString()