

Dynamic Forms

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Dynamic Forms

Now that you know where everything is, let's review some important concepts about dynamic forms: master and body pages, subforms and flow, and tables. These are usually the concepts that trip people up when they start creating Designer forms. By mastering these ideas early, you'll avoid many pitfalls when designing and implementing your forms in the later exercises.

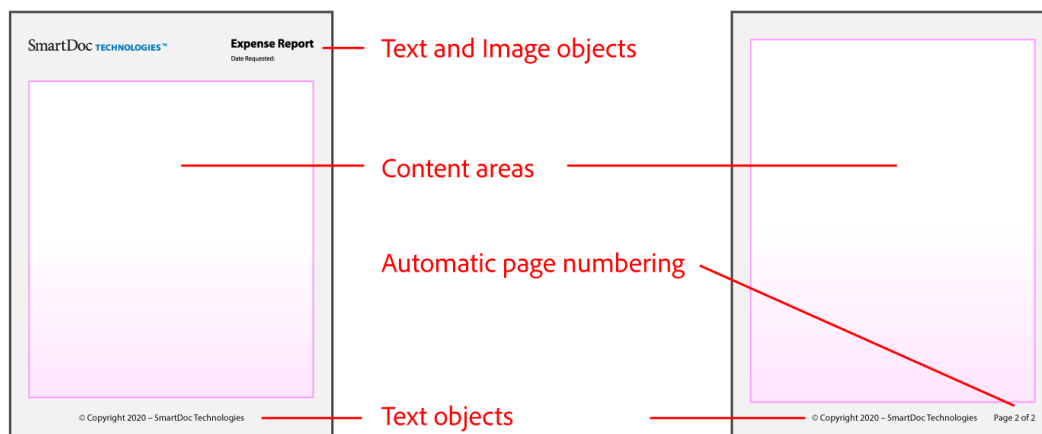
Master and Body Pages

Designer documents consist of master pages and body pages. Master pages define the layout and background elements of your form. You should put common page items like page numbers, repeating logos, and footer information on your master pages. Body pages should contain all the form objects that are unique to a particular page.

When you're working with multipage forms, it's quite possible that you'll need a different look and feel on different pages. For instance, an account opening form may require three pages of interactive objects and six pages of legal text in columns. In this case, it makes sense to define two different master pages: one for the body pages with the interactive objects and one for the body pages with the legal text.

Master pages

You edit your master pages in the Master Pages tab in the Layout Editor. If you don't see this tab, choose View - Master Pages. Every Designer file must have at least 1 master page. The SmartDoc Expense Report (*from the Student Files*) has two master pages. The first master page (*masterPage1 on the left*) contains the document's header on the top. The second master page (*masterPage2 on the right*) contains automatic page numbering on the bottom.



Both master pages contain Content Area objects which are the pink boxes. These objects define the outer bounds of the layout area for each associated body page. Content Area objects are particularly important for dynamic forms with flowing content. In the SmartDoc Expense Report form, the content area on masterPage2 is larger than the content area on masterPage1. This larger content area means the body pages associated with masterPage2 can display more information than the body page associated with masterPage1. Content Area objects are regular Designer objects and are found in the Standard Object Library palette.

The SmartDoc Expense Report is a dynamic form, and a dynamic form can grow to accommodate every data item. Whether it has 1 page or 1000 pages, it will always have one instance of masterPage1. This is achieved by setting the Restrict Page Occurrence property on masterPage1 as shown in the illustration on the left. So the master page with the logo and header will only appear once and will always appear once, on the first page.

However, notice in the illustration on the right that masterPage2 doesn't have any page restrictions. Since it is the next master page in the hierarchy, it will be used for page 2 and for all subsequent pages in the dynamic form.

The image shows two side-by-side screenshots of the 'Object' window in AEM Forms Designer. Both windows have tabs for 'Master Page' and 'Pagination'. The left window is for 'masterPage1' and the right is for 'masterPage2'. Both have 'Paper Type: Default', 'Height: 11in', 'Width: 8.5in', and 'Orientation: Portrait'. The 'Restrict Page Occurrence' property is highlighted with a red box in both. In the left window, it is checked, and 'Min Count' and 'Max' are both set to 1. In the right window, it is unchecked, and the 'Min Count' and 'Max' fields are empty. Both have 'Presence: Visible'.

Body pages

Most of your form objects will be placed on body pages. Each body page will reference a master page. You can view your body page objects by switching from the Master Pages tab to the Design View tab in Designer. Body pages are subform objects in Designer and as such are treated just like any other subform.

Subforms and Flow

A *subform* is a container for 1 or more form objects. Subforms define the structure of your form, and you can nest a child subform inside a parent subform. In fact, there's no limit to the nesting you can do with subforms. Subforms in Designer (*left*) are like panels in AEM adaptive forms (*right*).

The image shows two side-by-side screenshots. The left screenshot shows the 'Hierarchy' view in AEM Forms Designer, displaying a tree structure of the form objects: 'expenseReport' (parent), '(Master Pages)' (child), 'masterPage1' (child), 'masterPage2' (child), 'page1' (child), 'employee' (child), 'line' (child), 'subHead' (child), 'firstName' (child), 'lastName' (child), 'clientName' (child), 'otherClientName' (child), 'notes' (child), 'expenses' (child), 'header' (child), and 'subHead' (child). The right screenshot shows the 'Form Container' in AEM adaptive forms, displaying a list of subforms: 'Root Panel', 'Employee', 'Expenses', 'Signature', 'Review', and 'Toolbar'. The 'EXPAND ALL' button is visible at the top right.

The child objects of a subform can be positioned or flowed within the subform. You control this with the Content property of the subform. Subforms can be set to Positioned which will enable you to place your child objects on an X/Y grid relative to the subform. Subforms can also be set to Flowed and there are 3 different flow directions for the child objects: Top to Bottom, Western Text, and Right to Left. You will see each of these examples in the exercises.

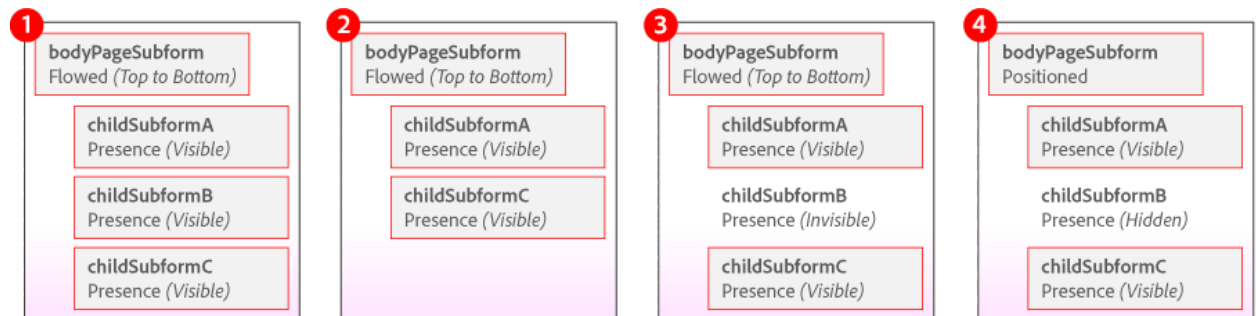
Subforms work in conjunction with the content areas that you learned about earlier. Content areas control where objects are located, and subforms control how objects are placed as the form is rendered. By grouping certain objects together in a subform, you can be assured that they'll be consistently positioned relative to each other as the form is rendered.

Depending on the incoming data or the user interaction, subforms can be repeated, expanded, or hidden. Repeating and expanding subforms are ideal for forms with repeating data like the SmartDoc Expense Report. Repeating subforms are child subforms that are placed inside an expanding parent subform. Because subforms are separate, independent sections of a form, they can be hidden or shown based on the needs of the user or other business logic.

Subforms can be challenging and complex, but they are what make dynamic documents dynamic. Without subforms and tables, which are just a type of subform, you wouldn't be able to create dynamic documents that grow and shrink based on data or user interaction.

Hidden and invisible subforms

You can hide and show subforms by setting the Presence property. The three most common values for the Presence property are *Visible*, *Hidden (Exclude from Layout)*, and *Invisible*. Depending on the option you choose for the Presence property and the Content property of the parent subform, different effects will result.



Consider the four scenarios illustrated here.

- In example #1, the parent is set to *Flowed* and all children are set to *Visible*.
- In example #2, the parent is also set to *Flowed* but childSubformB is set to *Hidden (Exclude from Layout)*. This will cause childSubformC and all subsequent subforms to automatically move up in the form to occupy the position previously held by childSubformB.
- In example #3, the parent is also set to *Flowed* but childSubformB is set to *Invisible*. It is true that childSubformB has disappeared but notice that childSubformC hasn't moved up like it did in the previous example. An object set to *Invisible* will still retain its place in the layout, it will simply not appear.
- In example #4, the parent is now set to *Positioned* so all child subforms will maintain their X and Y position relative to the parent. Even when childSubformB is set to *Hidden (Exclude from Layout)* childSubformC will not move up. A subform is only truly hidden when its parent is set to flowed.

Pagination and Subform Flow Is Different in HTML Forms

Pagination and subform flow work differently in the HTML renderings of your Designer files than they do in the PDF renderings. For instance, the repeating expense rows of the SmartDoc Expense Report will flow from page to page in

a PDF rendering of the form. However, in the HTML rendering, these repeating rows will simply repeat on the same HTML page without flowing to a secondary page.

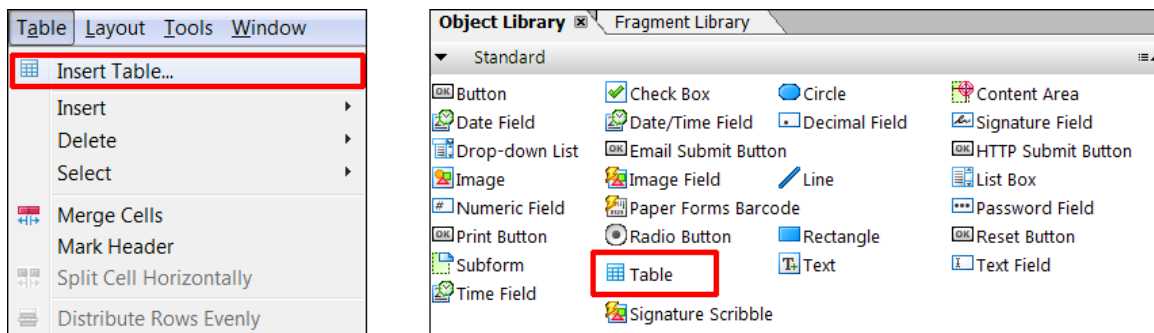
Tables

Tables in Designer are a lot like tables in a word processing program. You can use tables to organize data into a structured grid of related objects. But in Designer, tables are also complex container objects, so you can work with them just like you work with subforms.

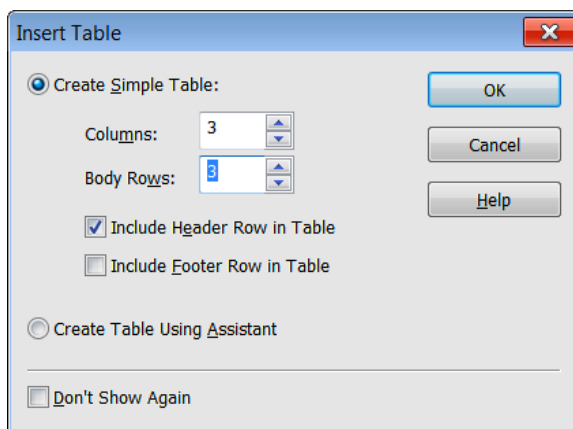
The Table menu and Table object

You can add a simple table to your form in either of the following ways.

- Click the *Table* menu and select *Insert Table* (left)
- Drag and drop a *Table object* from the Standard Object Library onto your form (right)



In both cases, Designer will launch the Insert Table dialog box (see illustration).



The Insert Table dialog box enables you to create a simple table or to launch the Table Assistant.

The Table Assistant

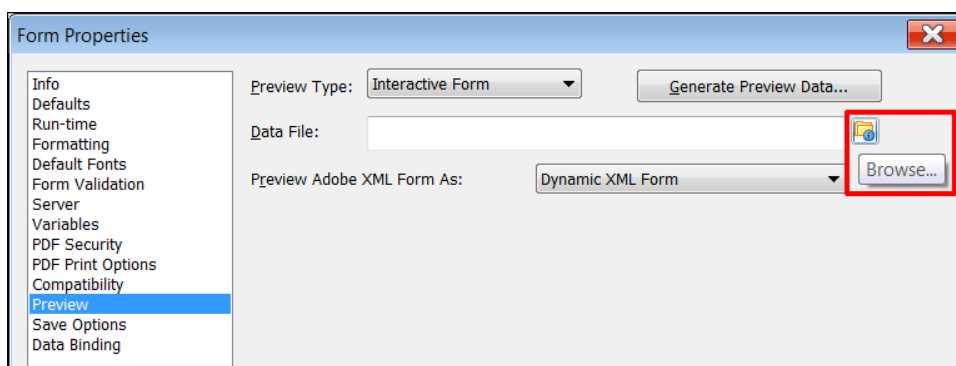
The Table Assistant is a multipage wizard tool, and it provides more features and additional information about tables. One of the additional tools in the Table Assistant is the Row Shading page, which enables you to set different colors for alternating rows. This is a useful design method to use on your forms. Changing the colors on alternating rows makes it easier for your users to read and comprehend table-based data.

Exercises

In these exercises, you will work with dynamic forms. Because these forms are dynamic, it's best to test them with sample data files to see how they will expand and contract. Ideally, you will test them with more than one data file to show different runtime possibilities.

The Expense Report with Dynamic Subforms

1. Open the **expenseReportCompleted.xdp** file from the Student Files if it is not already open.
2. Choose **File – Form Properties**. Designer opens the Form Properties dialog box.
3. Select **Preview** and click the **Browse** icon to right of the *Data File* field.



4. Locate and select the **expenseDataShort.xml** file in the Student Files and click **Open**.
5. Click **OK** to close the *Form Properties* dialog box.
6. Select **Preview PDF** to see the expense report fill with data. You should see 2 pages of expense report data.

	Receipt	Date	Category	Description	Cost	# of	Total
X	Yes	08/01/2009	Transportation	Train ticket to New York	\$16.00	1	\$16.00
X	No	08/01/2009	Meals	Breakfast with client	\$10.00	1	\$10.00
X	Yes	08/02/2009	Transportation	Taxi to office	\$15.00	1	\$15.00

7. Return to **Design View**.
8. Choose **File – Form Properties** again.
9. Select **Preview** and click the **Browse** icon to right of the *Data File* field.
10. Locate and select the **expenseDataLong.xml** file in the Student Files and click **Open**.
11. Click **OK** to close the *Form Properties* dialog box.
12. Select **Preview PDF** to see the expense report fill with data. You will see more pages and more expense rows.

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Expense Report

Date Requested: 08/27/2014

Employee

First Name	Last Name	Client Name	Other Client Name
James	Terry	Other	Fidelity

Notes

This was a one day trip to meet with the Fidelity e-Business team and National Financial on Summer Street

Expenses

Receipt	Date	Category	Description	Cost	# of	Total
Yes	08/26/2014	Transportation	Plane ticket (AirTrain) to Detroit, Michigan	\$174.21	1	\$174.21
Yes	08/26/2014	Lodging	Holiday Inn	\$156.62	1	\$156.62
Yes	08/26/2014	Meals	Dinner	\$19.00	1	\$19.00
Yes	08/26/2014	Meals	Breakfast	\$6.00	1	\$6.00
Yes	08/26/2014	Transportation	Taxi to Ford Motor Headquarters	\$9.09	1	\$9.09
Yes	08/26/2014	Meals	Snacks and drinks	\$3.00	1	\$3.00
Yes	08/26/2014	Meals	Lunch	\$7.00	1	\$7.00
Yes	08/26/2014	Transportation	Taxi to Holiday Inn	\$9.09	1	\$9.09
Yes	08/26/2014	Meals	Dinner	\$15.00	1	\$15.00
No	08/26/2014	Phone/Fax	Call to SmartDoc Beijing	\$2.00	1	\$2.00
Yes	08/26/2014	Lodging	Holiday Inn night 2	\$156.62	1	\$156.62
Yes	08/26/2014	Meals	Breakfast	\$8.00	1	\$8.00
Yes	08/26/2014	Transportation	Taxi to Ford Motor Headquarters	\$9.09	1	\$9.09
Yes	08/26/2014	Meals	Lunch	\$9.00	1	\$9.00
Yes	08/26/2014	Transportation	Taxi to Holiday Inn	\$9.09	1	\$9.09
Yes	08/26/2014	Meals	Dinner	\$13.00	1	\$13.00
Yes	08/26/2014	Lodging	Holiday Inn night 3	\$156.62	1	\$156.62
No	08/26/2014	Phone/Fax	Call to SmartDoc New Jersey	\$4.00	1	\$4.00
Yes	08/26/2014	Meals	Breakfast	\$7.00	1	\$7.00
Yes	08/26/2014	Transportation	Taxi to Ford Motor Headquarters	\$9.09	1	\$9.09

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Receipt	Date	Category	Description	Cost	# of	Total
Yes	08/27/2014	Transportation	Plane ticket (AirTrain) to Detroit, Michigan	\$174.21	1	\$174.21
Yes	08/27/2014	Lodging	Holiday Inn	\$156.62	1	\$156.62
Yes	08/27/2014	Meals	Dinner	\$19.00	1	\$19.00
Yes	08/27/2014	Meals	Breakfast	\$6.00	1	\$6.00
Yes	08/27/2014	Transportation	Taxi to Ford Motor Headquarters	\$9.09	1	\$9.09
Yes	08/27/2014	Meals	Snacks and drinks	\$3.00	1	\$3.00
Yes	08/27/2014	Meals	Lunch	\$7.00	1	\$7.00
Yes	08/27/2014	Transportation	Taxi to Holiday Inn	\$9.09	1	\$9.09
Yes	08/27/2014	Meals	Dinner	\$15.00	1	\$15.00
No	08/27/2014	Phone/Fax	Call to SmartDoc Beijing	\$2.00	1	\$2.00
Yes	08/27/2014	Lodging	Holiday Inn night 2	\$156.62	1	\$156.62
Yes	08/27/2014	Meals	Breakfast	\$8.00	1	\$8.00
Yes	08/27/2014	Transportation	Taxi to Ford Motor Headquarters	\$9.09	1	\$9.09
Yes	08/27/2014	Meals	Lunch	\$9.00	1	\$9.00
Yes	08/27/2014	Transportation	Taxi to Holiday Inn	\$9.09	1	\$9.09
Yes	08/27/2014	Meals	Dinner	\$13.00	1	\$13.00
Yes	08/27/2014	Lodging	Holiday Inn night 3	\$156.62	1	\$156.62
No	08/27/2014	Phone/Fax	Call to SmartDoc New Jersey	\$4.00	1	\$4.00
Yes	08/27/2014	Meals	Breakfast	\$7.00	1	\$7.00
Yes	08/27/2014	Transportation	Taxi to Ford Motor Headquarters	\$9.09	1	\$9.09

Sub Total: \$751.00
Less Cash Advances: \$0.00

TOTAL \$751.00

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13. Return to **Design View**.

14. Select the **Hierarchy** panel if it is not already selected.

15. Expand the hierarchy by selecting **page1 – expenses – expensesWrapper – expenseRow** (see illustration).

16. With **expenseRow** selected, select the **Binding** tab of the Object palette.

17. Notice the expenseRow has a data binding of **\$.ExpenseItem[*]** and is set to repeat for each data item. This is why the form is dynamic. An *expenseRow* is created for each *ExpenseItem*.

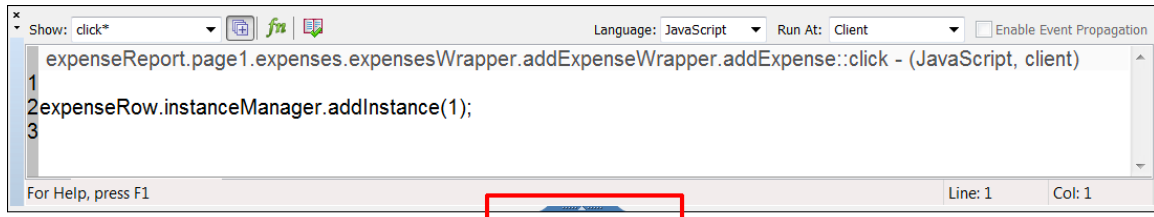
18. Select **expensesWrapper** (the parent of *expenseRow*).

19. Select the **Subform** tab of the Object palette.

20. Notice the expensesWrapper is set to *Flowed* with a Flow Direction of *Top to Bottom*. This will also be true for the parent subform (*expenses*) and the grand-parent subform (*page1*). A body page is just another subform.

21. Select the **Add Expense** button and open the **Script Editor** by clicking the handle outlined in red below (see illustration).

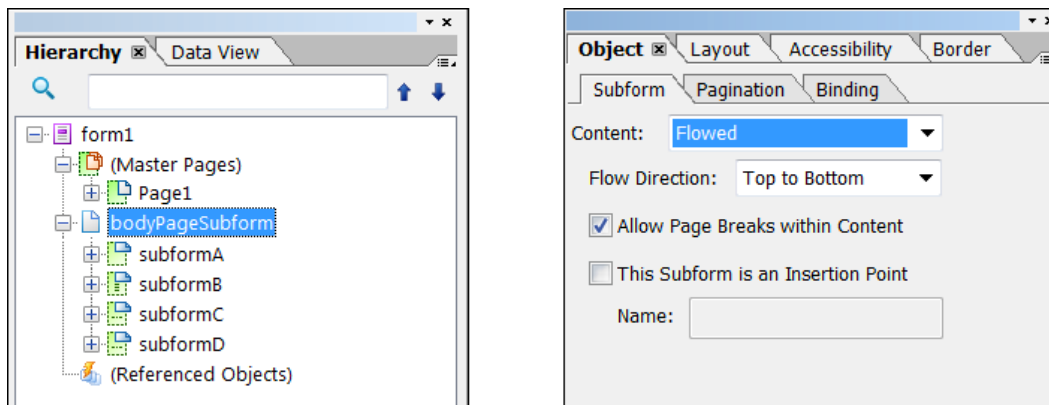
22. Select the **click** event and you will see the script that creates a new instance of the *expenseRow*.



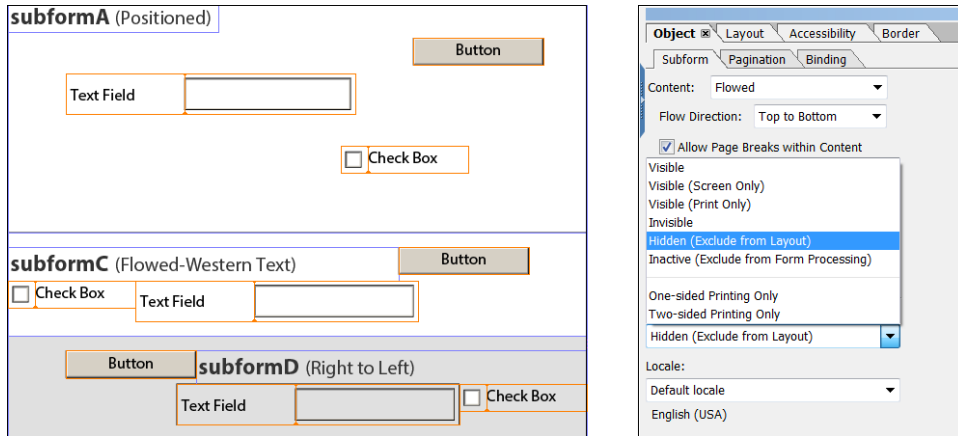
Subforms and Flow

As with other Designer features, subforms are easy to understand if you look at an example.

1. Open **basicSubform.xdp** from your Student Files.
2. With the **bodyPageSubform** selected (left), click the **Subform** tab of the Object palette (right).
3. Notice the Content property is set to **Flowed** and the Flow Direction is **Top to Bottom**. This property governs the 4 child subforms. Subforms A, B, C, and D will be Flowed, Top to Bottom.

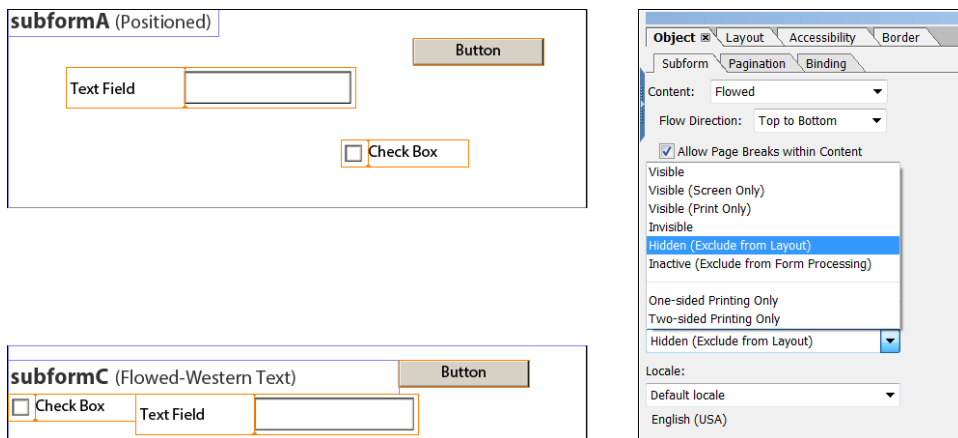


4. Select **subformA** and notice its Content property is set to **Positioned**. The child objects of subformA will be positioned exactly where you place them in Design View. Each child object will maintain its X and Y position relative to subformA regardless of where subform A appears on the rendered form.
5. Select **subformB** and notice its Content property is set to **Flowed** and the Flow Direction is **Top to Bottom**, just like bodyPageSubform. The child objects will be flowed in the layout according to their position in the hierarchy.
6. Select **subformC** and notice its Content property is set to **Flowed** and the Flow Direction is **Western Text**. The child objects will be placed left to right and wrapped onto the next line if more space is required.
7. Select **subformD** and notice its Content property is set to **Flowed** and the Flow Direction is **Right to Left**. The child objects will be placed right to left and wrapped onto the next line if more space is required.
8. Select **subformB** and notice its Presence property is set to **Visible**.
9. Click the Presence property drop-down and select **Hidden (Exclude from Layout)**.



The form content below subformB will now move up because the parent (*bodyPageSubform*) is set to *Flowed* and the Flow Direction is *Top to Bottom*.

10. Select **subformB** again and change its Presence property to **Visible**.
11. Select **bodyPageSubform** and change its Content property is set to **Positioned**.
12. Select **subformB** and change its Presence property back to **Hidden (Exclude from Layout)**. This time, the form content below subformB does not move up because the parent (*bodyPageSubform*) is set to Positioned.



Note: Remember, it is always the parent that controls the layout of the child objects.

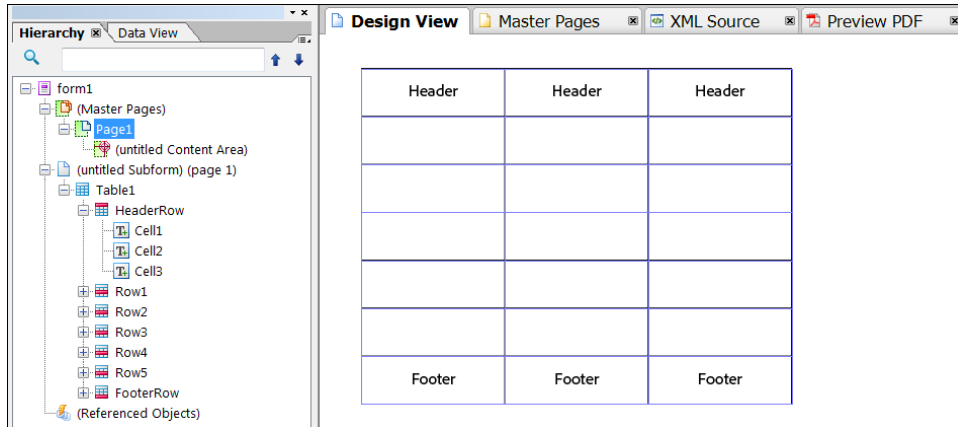
Create a Simple Table

Follow these steps to create a simple table.

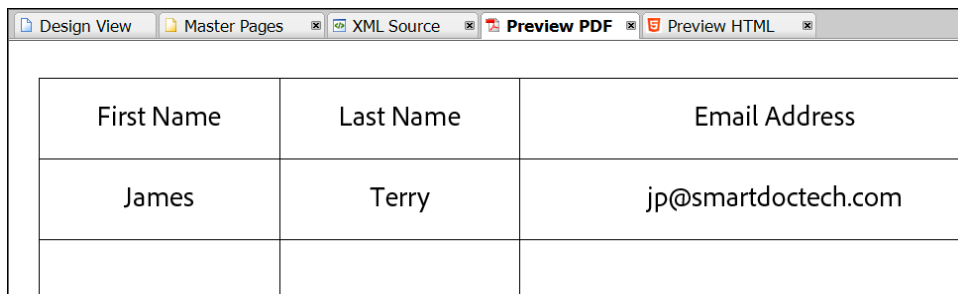
1. Select **File – New**. Designer launches the *New Form Assistant*.
2. Select **Use A Blank Form**.
3. Click **Next** to continue.
4. Keep the defaults, and click **Finish** to create your new form.
5. Select the **Table** menu. The Table menu is on top, and it provides many tools for working with tables.
6. Select **Insert Table** and you will see the *Insert Table* dialog box.

7. Keep the default of *Create Simple Table* and select the **Include Header Row in Table** and the **Include Footer Row in Table** options.
8. Click **OK**.

Designer will create a simple table in the Layout Editor (*see illustration*).



9. Double-click on each Header and change their names so you have a column for **First Name**, **Last Name**, and **Email Address**.
10. Expand **Row1** and you will notice that the form object in each cell is a Text object.
11. Select the **Cell1** text object and change its type to **Text Field**. You can do this in the Type property of the Object palette.
12. Repeat this step for Cell2 and Cell3 so every cell in Row1 has a Text Field input.
13. Click **Cell3** and select the Layout palette.
14. Enter **2.5** for the Width. This will enable you to enter longer email addresses.
15. Click **Preview PDF** and enter your name and email address into the first row.



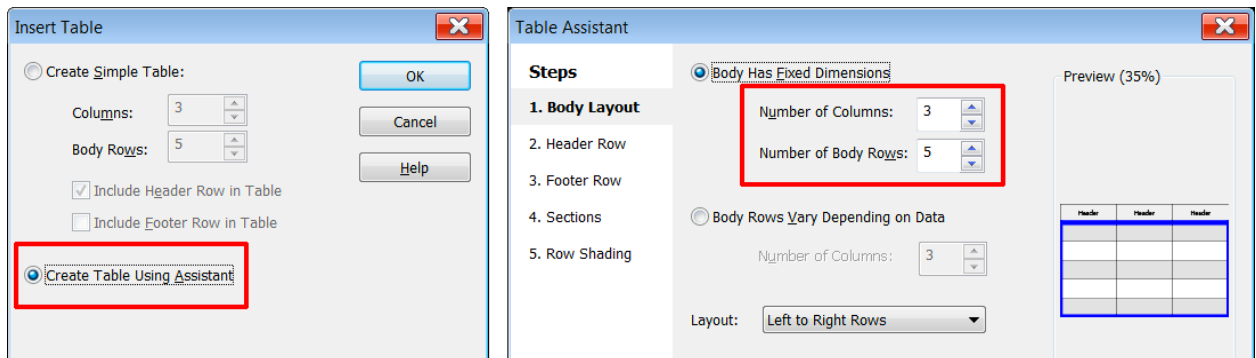
16. Select **Design View**.
17. Delete this table.

Use the Table Assistant

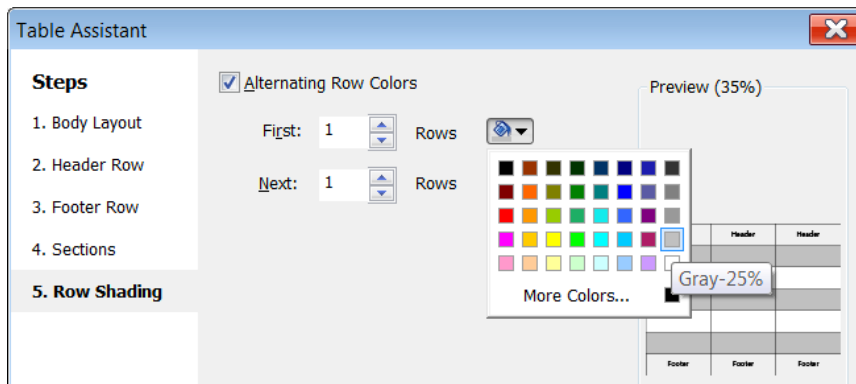
Follow these steps to create a more detailed table with the Table Assistant

18. Click the **Table** menu and select **Insert Table**.

19. Select **Create Table Using Assistant** (see illustration) and click **OK**.
20. Select **3** Columns and **5** Body Rows (see illustration).



21. Click **Next**.
22. Select **Has Header Row** and click **Next**.
23. Select **Has Footer Row** and click **Next**.
24. Select **Has Body Rows And No Sections** and click **Next**.
25. Select **Alternating Row Colors** and select a **Gray-25%** for the First row.
26. Select **white** for the second row.



27. Click **Finish**.
28. You now have a table with alternating row colors.

The Expense Report with a Dynamic Table

A good example of a dynamic table is the purchaseOrder.xdp form in the Student Files. Follow these steps to see how a dynamic table is similar to the dynamic subforms in the SmartDoc Expense Report:

1. Open the **ExpenseReport2020_finished.xdp** from your Student Files.
2. Select **Preview PDF**.
3. Click the **Add an Expense** button and notice it has the same functionality as the other dynamic expense report.

Week Of:	Category	Description	Receipt	Amount
X 03/21/2021	Meals	Starbucks coffee and breakfast	Yes	12.00
X 03/21/2021	Lodging	Hilton Hotel	Yes	225.00
X 03/21/2021	Meals	Panera	Yes	15.00

Add Expense

4. Select **Design View**.
5. Expand the expenses subform and the expensesWrapper table so you can select the **expenseRow** table row.
6. With **expenseRow** selected, select the **Binding** tab of the Object palette.
7. Notice the expenseRow has a data binding of **\$.ExpenseItem[*]** and is set to repeat for each data item. This is exactly the same as the previous example with the dynamic subforms.
8. Select the **Add Expense** button and open the **Script Editor** by clicking the handle outlined in red below (see *illustration*).
9. Select the **click** event and you will see the script that creates a new instance of the expenseRow.

Show: click*
Language: JavaScript Run At: Client ☐ Enable Event Propagation

```

1 expenseReport.page1.expenses.expensesWrapper.addExpenseWrapper.addExpense::click - (JavaScript, client)
2 expenses.expensesWrapper.expenseRow.instanceManager.addInstance(1);
3

```

For Help, press F1Line: 1 Col: 1

Dynamic forms can be created with dynamic subforms or with dynamic tables.