

(I) Linking Data from Several Worksheets and Workbooks

In Excel Level III, we have learned and seen examples of how to link data from one worksheet to the next in the same workbook. Here, we are going to expand those examples one step further by:

1. Linking among several worksheets in the same workbook
2. Linking data from one workbook to another

1. Linking among several worksheets in the same workbook

- a) Open "**PersonalBudget.xls**" workbook on your computer. In this workbook, there are four separate worksheets: *Total Budget*, *Income-Expense Yearly Report*, *Daily-Living Expense*, and *Charts*. *Total Budget* is set up to input all possible income sources and expenses from January through December for any given year. *Income-Expense Yearly Report* is set up just to pull out each category at the end of each month to see overall view of the budget sheet. *Total Budget* and *Income-Expense Yearly Report* worksheets will be linked. *Daily-Living Expense* is set up as an example to feed data on a weekly basis. You may set up for similar worksheets for other expense categories if needed.

Charts worksheet is created to show a few examples to see your data visually. Again, you may create more charts on other expense categories.

21	Daily living					
22	Groceries	0.00	0.00	0.00	0.00	0.00
23	Child care	0.00	0.00	0.00	0.00	0.00
24	Dry cleaning	0.00	0.00	0.00	0.00	0.00

Navigation: Total Budget | Income-Expense Yearly Report | Daily-Living Expense January | Charts

- b) Let's link the January figure cell B3 on *Income-Expense Yearly Report* worksheet with income totals cell B8 in *Total Budget* worksheet. When all possible income in January is filled in the January column in *Total Budget* worksheet we want to see the result of total incomes shows up in cell B3 of *Income-Expense Yearly Report* automatically. Type the '=' sign in cell "B3" on the *Income-Expense Yearly Report* sheet under January column. Then click on cell B8 (your source data) in the *Total Budget* sheet to link.

	A	B	C	D	E	F
1		Jan	Feb	March	April	May
2	Income - Expense Yearly Report					
3	Total Income	=				
4						
5	Home					
6						
7	Daily living					
26						
27	Total Income	0.00	0.00	0.00	0.00	0.00

Navigation: Total Budget | **Income-Expense Yearly Report** | Daily-Living Expense January

Annotation: A red circle highlights the '=' in cell B3. A red arrow points to the text: "Click here first, then go to your source data: Total Budget sheet."

Income-Expense Yearly Report Worksheet

- c) Click in cell “B8” and hit “Enter” while the cell is still surrounded by marching ants. (Note: You do not need to click anywhere else.)

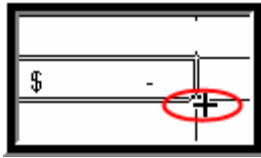
	A	B	C	D
1	Personal Budget			
2				
3		Jan		
4	Income			
5	Wages	0.00	0.00	0.00
6	Interest/dividends	0.00	0.00	0.00
7	Miscellaneous	0.00	0.00	0.00
8	Income totals	0.00	0.00	0.00
9	Expenses			
10	Home			

Total Budget Worksheet

- d) You will be back at the Destination sheet (*Income-Expense Yearly Report*, in this example) to see the results. Click on the cell where you placed the links – cell B3 in this example. The formula bar shows the linking formula as ‘=TotalBudget!B8’, meaning Cell B3 on the *Income-Expense Yearly Report* sheet is linked to cell B8 on the *Total Budget* sheet.

	A	B	C	D	E
1		Jan	Feb		
2	Income - Expense Yearly Report				
3	Total Income	0.00			
4					
5	Home				
6					
7	Daily living				
8					

- e) You can copy the formula in cell B3 on the *Income-Expense Yearly Report* sheet to cell C3, D3, and E3, so on up to M3 for the remaining months. Excel will **relatively** change the cell addresses to reflect appropriate columns from the *Total Budget* sheet.



(Note: Use **Fill Handle** to drag and copy formula from cell B3 to cells C3 through M3.)

	A	B	C	D	E
1		Jan	Feb	Mar	
2	Income - Expense Yearly Report				
3	Total Income	0.00	0.00	0.00	0.00
4					
5	Home				
6					
7	Daily living				

Formula bar: =Total Budget!C8

Cell address changes relatively here.

Go to **Exercise 1** and try linking more cells from *Total Budget* worksheets to the *Income-Expense Yearly Report* sheet.

2. Linking data from one workbook to another

Assume that you like to see details on how much financial assistance you are providing to your child in each month. You probably will create a separate workbook that contains detailed lines on the type of assistance you provide. Open **FinancialAssistance.xls** workbook. At the end of each month you will incorporate the total figure for the month into your **PersonalBudget.xls** workbook. Here is how.

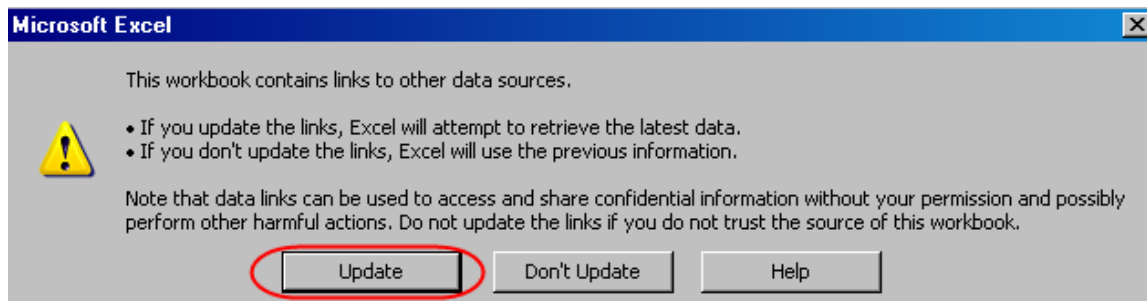
- Open the **PersonalBudget.xls** workbook. (Destination workbook). Click on the cell B103 in *Total Budget* worksheet where you want your linked data to appear for January figure on financial assistance. Type the “=” sign in the cell.
- Open the **FinancialAssistance.xls** workbook (Source workbook).
- Click on the cell that contains the January total financial assistance figure – cell B9. Hit “enter”. You will see the result in your Destination workbook, **PersonalBudget.xls** right away. Save your work after linking.

The image shows two side-by-side Excel workbooks. The left workbook is titled 'PersonalBudget.xls' and the right is 'FinancialAssistance.xls'. In the 'PersonalBudget.xls' workbook, the 'Total Budget' worksheet is active, showing a table with columns for months (Jan, Feb, March, April) and rows for various budget categories. Cell B103, under 'Finan. Asst. to our Kid' for January, contains an equals sign (=) and is circled in red. A red arrow points from this cell to cell B9 in the 'FinancialAssistance.xls' workbook. Cell B9 in the second workbook is the 'Total' row for January, containing the value '0.00', which is also circled in red. A text box with a black border and white background is positioned below the arrow, containing the text: 'Link this cell in PersonalBudget.xls workbook to the cell in FinancialAssistance.xls workbook.'

Personal Budget				
	Jan	Feb	March	April
Income				
89				
Financial obligations				
91 Long-term savings	0.00	0.00	0.00	0
92 Retirement (401k, Roth IRA)	0.00	0.00	0.00	0
93 Credit card payments	0.00	0.00	0.00	0
94 Income tax (additional)	0.00	0.00	0.00	0
95 Other obligations	0.00	0.00	0.00	0
96 Financial obligation totals	0.00	0.00	0.00	0
97				
Misc. payments				
99 Wedding Gifts	0.00	0.00	0.00	0
100 Baby Showers	0.00	0.00	0.00	0
101 Birthday Gifts	0.00	0.00	0.00	0
102 Legal Fees	0.00	0.00	0.00	0
103 Finan. Asst. to our Kid	=	0.00	0.00	0
104 Misc. payments totals	0.00	0.00	0.00	0
105				

Financial Assistance to Our Kid						
	Jan	Feb	March	April	May	June
4 Car Payments						
5 Tuition Assistance						
6 Grocery						
7 Travel Money						
8 Clothing						
9 Total	0.00	0.00	0.00	0.00	0.00	0
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						

Next time you open the **PersonalBudget.xls** workbook, a message box shown below will come up to remind you that the workbook contains links to other data sources. If those data sources were updated, you do want to include those updates in your workbook. Click on “Update” to let Excel attempt to retrieve the latest data from your source workbooks. See below.



Go to Exercise 2.

Note: Make sure you click on “Update” when opening your **PersonalBudget.xls** to retrieve the latest data from your source workbooks. If you desire to use the previous information but not the updates, click on “Don’t Update”.

(II) Create a Drop-down List from a range of cells

To make data entry easier when you have more than one option to select, or to limit entries to certain items that you define, you can create a drop-down list of valid entries that is compiled from cells elsewhere on the worksheet. When you create a drop-down list for a cell, it displays an arrow next to that cell. To enter information in that cell, click the arrow, and then click the entry that you want.

Here is how you create a Drop-down List.

1. You need to create a list of valid entries for the drop-down list. You can type the entries in a single column or row normally without blank cells. You can open up a separate worksheet in the same workbook and type in your entries on that worksheet. *(Normally, you want to place all your lists on one worksheet in separate columns.)*
2. Sort the data in the order that you want it to appear in the drop-down list.
3. Define a name for the list. Here is how.
 - a. Select the cells or range of cells that you want to name.
 - b. Click on **Name** box at the left end of the formula bar.
 - c. Type the name of the cells and hit '**Enter**'. OR

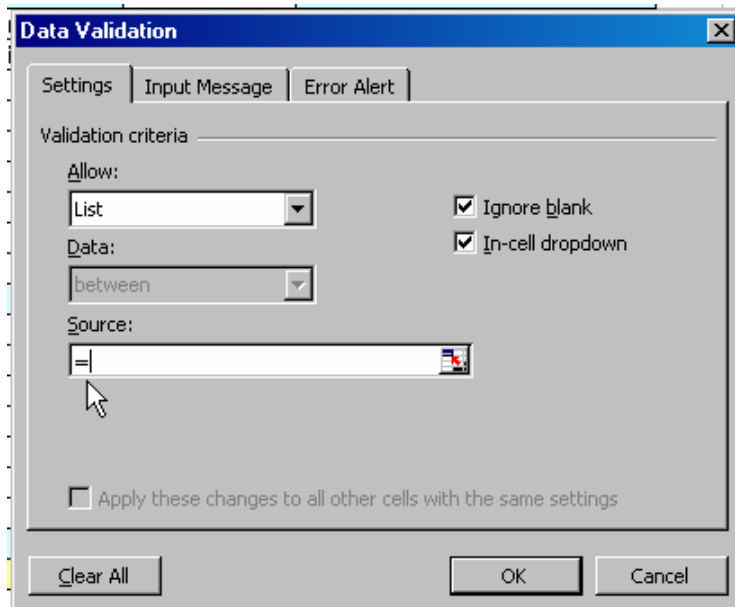
OR

- a. Select the cells or range of cells that you want to name.
- b. Click **Insert>Name>Define**.
- c. Type in a name, click **OK**.

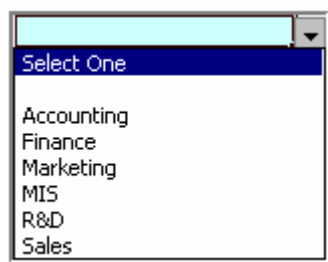
Assume you have to identify your department on your weekly timesheet, and there are 6 departments in your company such as Sales, Finance, R&D, MIS, Accounting, and Marketing. On a separate worksheet, type in the names of all departments and *sort them out in ascending order*. You probably want to begin your list with a cell that reads 'Select One' to indicate that there is a drop-down list in this cell. See example below.



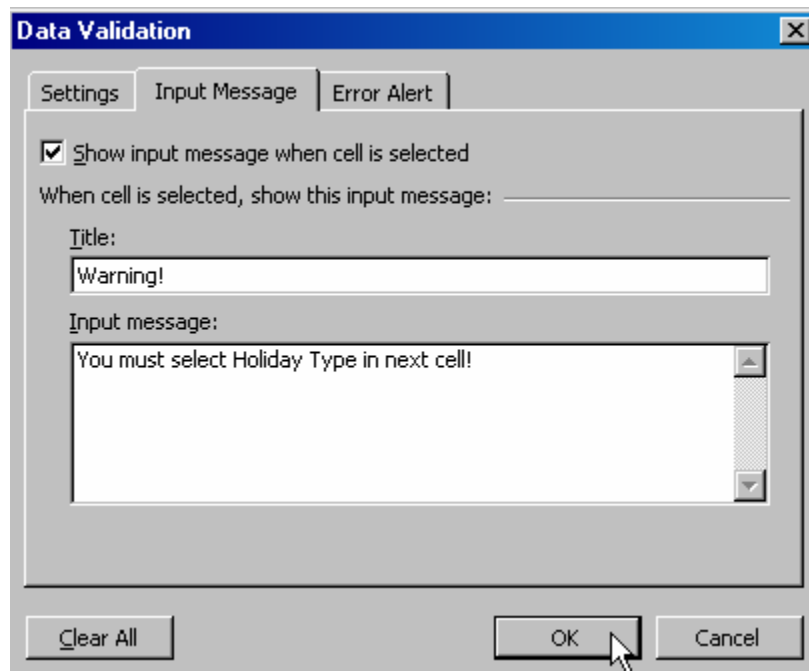
4. Select a cell on the worksheet where you want to show the list. Click on:
 - a. **Data** on your Toolbar.
 - b. Select **Validation**. The **Data Validation** dialog box will appear.
 - c. Select **List** from the drop-down choice in the **Allow** box.
 - d. In the **Source** box, type in the '=' equal sign *and the name of the list*.
 - e. Make sure that the **In-cell drop-down** check box is selected.
 - f. To specify whether the cell can be left blank, select or clear the **Ignore blank** check box. Click **OK**. See below.



Once a drop-down list is created for these departments, it should look like this in the result cell.



- g. Optionally, you can display an input message when the cell is clicked. Click on the **Input Message** tab in the **Data Validation** box and type in your **Title** and **message** in **Input Message** box. Check the box that says “Show the input message when the cell is selected”. Type in an appropriate title in the **Title** box and a message in the **Input Message** box. Click **OK**. See below for example.



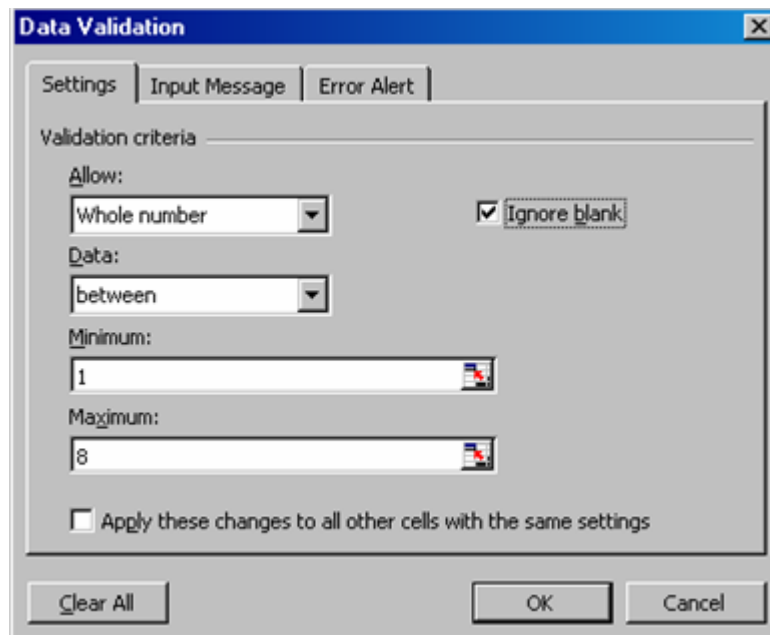
The following example displays an input message when the cell is clicked.

Holiday Hours	Holi

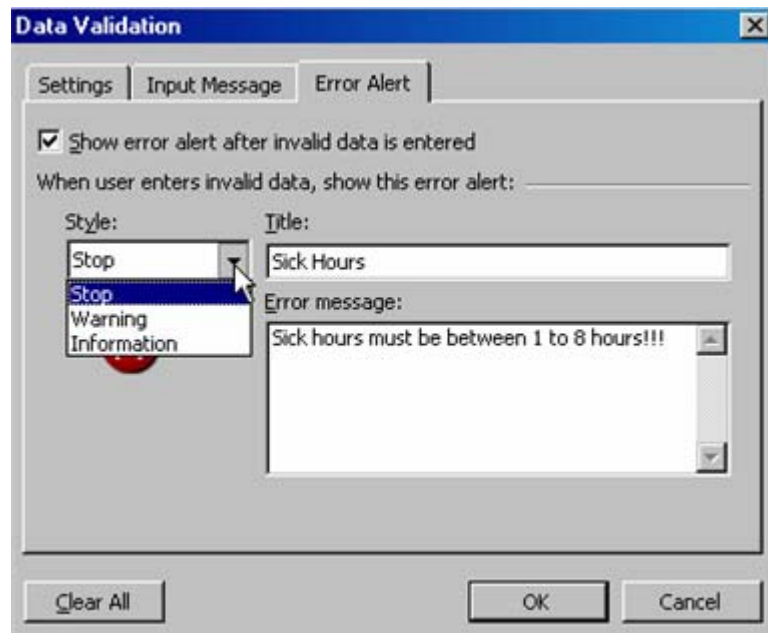
Warning:
You must select
Holiday Type in
next cell!

- h. You may also “stop” user from inputting invalid data by using “Error Alert” function in this Data Validation window. You will have to use in combination with “Settings” function. Assume in this timesheet example, you want to limit user to input sick hours as whole numbers between 1 to 8 hours. You can place your limits by following the steps below.

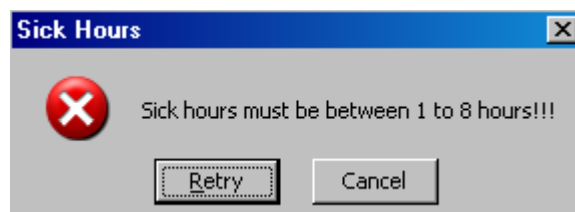
First, select the cell or cell blocks you want to put your limits. In this example, block cell E4 through E10. Next, click on Data>Validation; use “Settings” tab in Data Validation window to set sick hours limit between 1 to 8 hours in whole numbers by using drop-down arrows. See below.



Next, click on “Error Alert” tab to input your “Error message” if invalid data is placed in those cells. Under “Style”, using “Stop” will not let user to input any invalid data while “Warning” and “Information” will show the “Error message” but will let the user input invalid data. Make sure “Show error alert after invalid data is entered” box is checked to show the “Error message”.

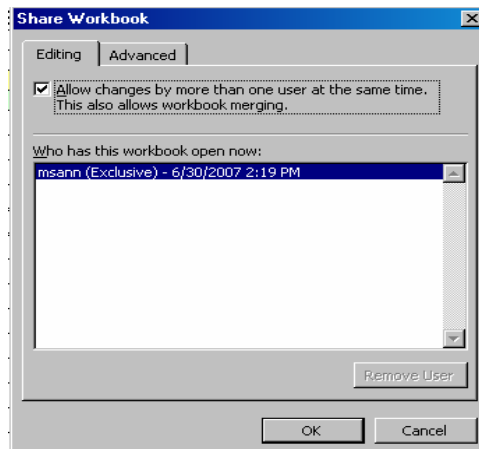


If an invalid data is placed in those cells and if you use “Stop” under Style to stop the user for doing so, the following window will pop up and make the user to correct the data until it meets the criteria.

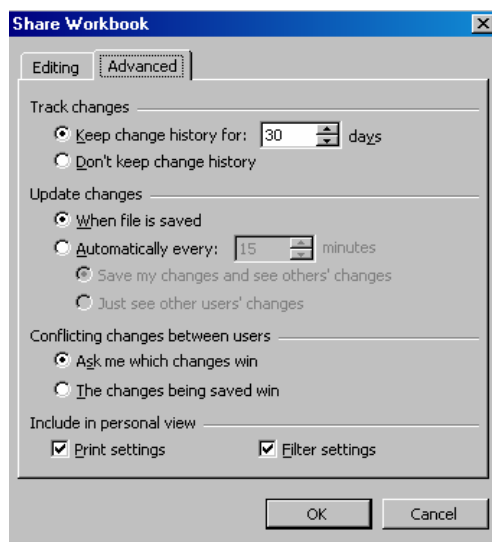


(III) Sharing Your Workbook with Multiple Users

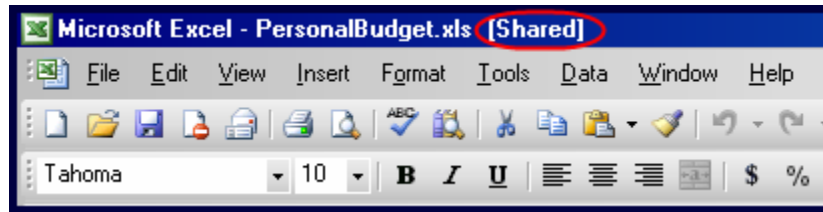
First, you need to store your workbook at a network location where multiple users can log onto and use it. Share your workbook by clicking on **Tools>Share workbook** and check the box to allow changes by user more than one user at the same time. This means that more than one person can edit the same data, even simultaneously.



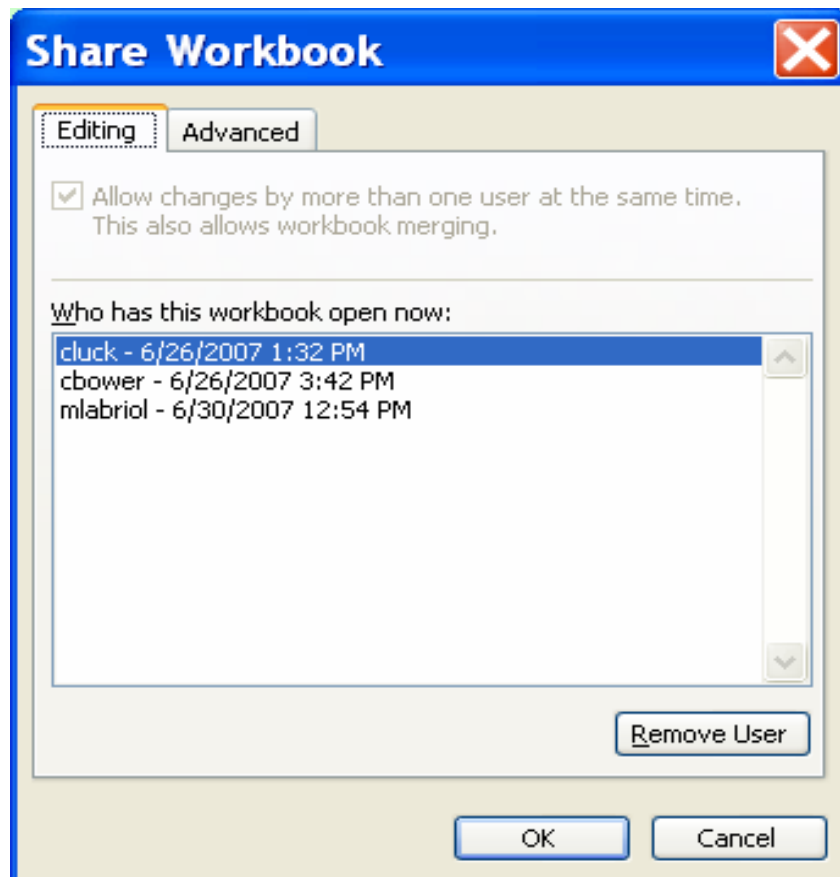
To verify how many days to keep track of changes and how you would like to save the updates, click on the **Advanced** tab and make your choice.



After sharing your workbook, the word [shared] will appear next to your file name in the title bar.

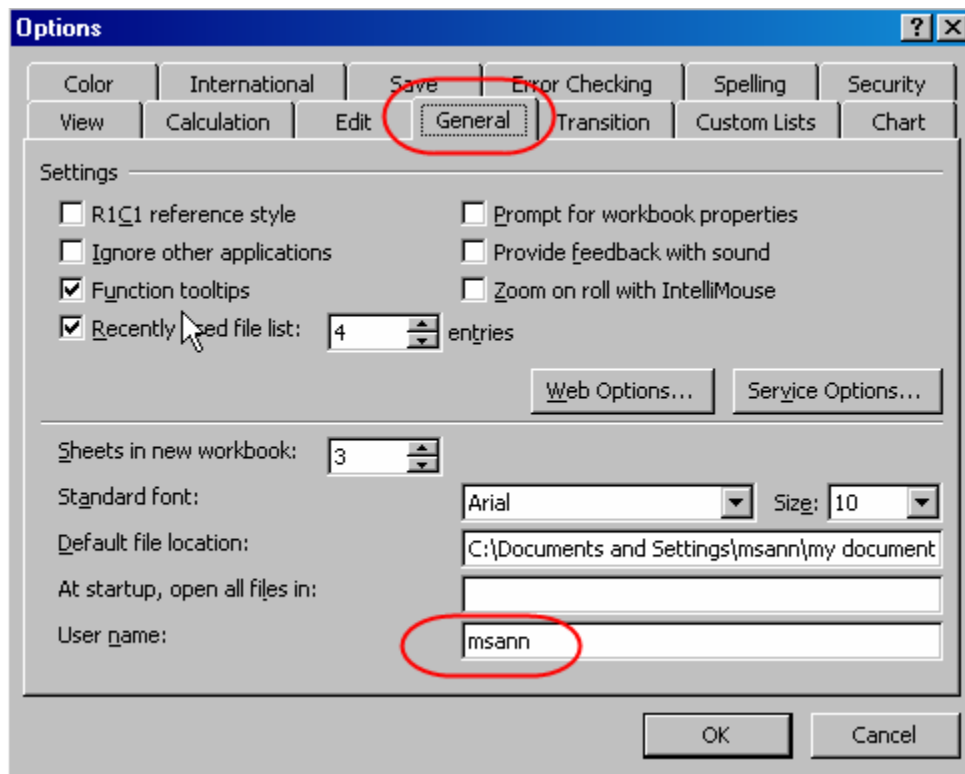


If each user uses their own computer assigned under their name, individual users can log onto their computer, retrieve the shared workbook from the network location (provided they have access to a network), and edit it. Individual changes can be traced by user name. To see who else has the workbook open, click **Share Workbook** on the **Tools** menu, and then click on the **Editing** tab. See below for example.

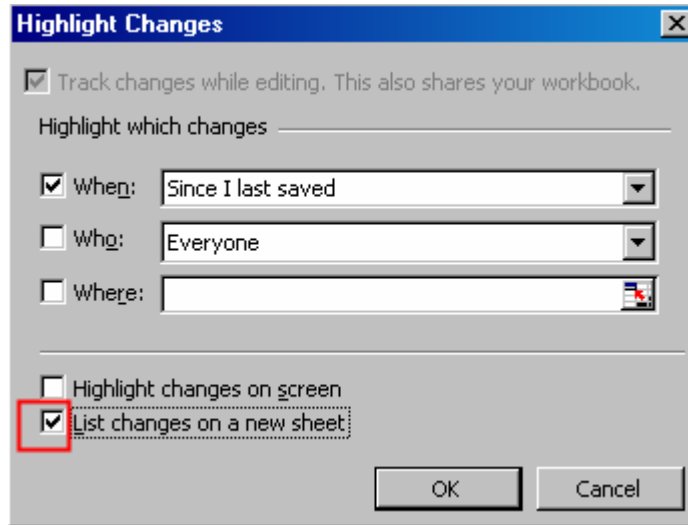


In a case where everyone shares one computer to edit the shared workbook, the person needs to identify their user name to validate their changes. To do this, follow these steps.

- a) Open the workbook.
- b) Set the user name to identify your work in the shared workbook: on the **Tools** menu, click **Options**, click the **General** tab, and then type your user name in the **User name** box. Click **OK**. See below. You need to identify yourself every time you open the workbook before you make changes.



- c) Enter and edit data as usual. Then save your work. To trace who made what changes, click on **Track Changes** under the **Tools** menu. Select **Highlight Changes**, and check the box where it says **List changes on a new sheet**. See box below.



The **When** box gives you a choice to see: *all changes, since I last saved, not yet reviewed, or since date*. You can make your choice to see changes made by *everyone, everyone but me, or individual user name* by clicking on drop-down box next to **Who**: . By checking the box to see the changes on a new sheet, you can see details of changes made by different users on a separate worksheet automatically named as *History* sheet in same workbook. The list details the date, time, who, where and what changes were made by all users. See below.

	A	B	C	D	E	F	G	H	I	J	K
1	Action Number	Date	Time	Who	Change	Sheet	Range	New Value	Old Value	Action Type	Losing Action
2	1	6/30/2007	12:38 PM	msann	Cell Change	Kit	B5	\$20.00	<blank>		
3	2	6/30/2007	12:38 PM	msann	Cell Change	Kit	B6	\$20.00	<blank>		
4	3	6/30/2007	12:38 PM	msann	Cell Change	Summary	B12	=Kit!B5	<blank>		
5	4	6/30/2007	12:38 PM	msann	Cell Change	Summary	B14	=Kit!B6	<blank>		
6	5	6/30/2007	1:09 PM	msann	Cell Change	Summary	B14	<blank>	=Kit!B6		
7	6	6/30/2007	1:09 PM	msann	Cell Change	Kit	B5	<blank>	\$20.00		
8	7	6/30/2007	1:09 PM	msann	Cell Change	Kit	B6	<blank>	\$20.00		
9	8	6/30/2007	1:09 PM	msann	Cell Change	Summary	B12	=Kit!B5	=Kit!B5		
10	9	6/30/2007	1:20 PM	mmcneal	Cell Change	Summary	B14	=Kit!B6	<blank>		
11	10	6/30/2007	1:20 PM	mmcneal	Cell Change	Kit	B5	\$20.00	<blank>		
12	11	6/30/2007	1:20 PM	mmcneal	Cell Change	Kit	B6	\$20.00	<blank>		
13											
14	The history ends with the changes saved on 6/30/2007 at 1:20 PM.										
15											
16											

Note: If you prefer seeing changes made in each cell by seeing comments upon selecting that cell, check the box for **Highlight changes on screen**. (**Note:** Either choice is fine. It's your personal preference. It's a bit easier on eye to see the list on a separate sheet. **Save the history sheet by copying it into a new workbook to preserve it before you stop sharing your workbook or else all history on track changes will be gone. The History sheet will not automatically save.**)

(IV) Protect a Shared Workbook

Protecting a shared workbook will prevent against other users removing the shared workbook's change tracking feature and require that a password be used to unprotect it.

1. Open **Tools**, point at **Protection**, and click **Protect Shared Workbook**. (If you have not already shared the workbook, you will see **Protect And Share Workbook**. Password can be only added if the workbook is unshared at the time of Protection.)
2. In the Protect Shared Workbook dialog box, select **Sharing With Track Changes**.
3. Either click **OK** or type a password (if workbook is unshared at the time of protection) and click **OK**. In the Confirm Password dialog box, type the password a second time and click **OK**.

(Note: If the workbook is already shared, when you point to **Protection** on the **Tools** menu, click **Protect Shared Workbook**, and select the **Sharing with Track Changes** check box, you cannot assign a password for this protection. To assign this password, you must first unshare the workbook.)

To stop sharing a workbook

Do the followings:

1. Have all other users save and close the shared workbook. If other users are editing, they will lose any unsaved work.
2. Unsharing the workbook will delete the change history. If you want to keep a copy of this information, print out the *history* worksheet or copy it to another workbook and save it.
3. On the **Tools** menu, click **Share Workbook**, and then click the **Editing** tab.
4. Make sure that you are the only person listed in the **Who has this workbook open now** box.

5. Clear the **Allow changes by more than one user at the same time** check box.
(**Note:** if this check box is not available, you must have protected your workbook. You must unprotect the workbook before clearing the check box.)
6. When prompted about the effects on other users, click **Yes**.

Note: Sharing a Workspace is not the same as sharing a workbook. Shared workspaces are areas on Microsoft Windows SharePoint Services web sites where people can access documents and other data. You can create a workspace and copy a workbook to it from the Shared Workspace task pane.

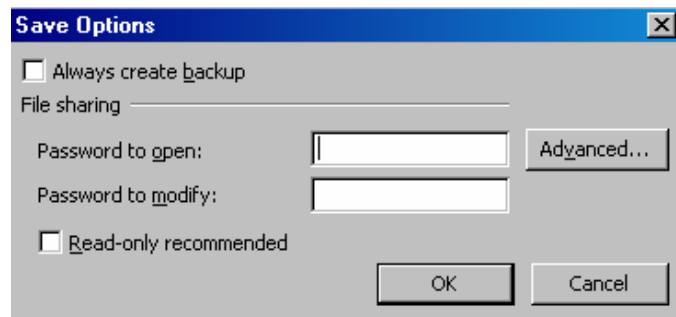
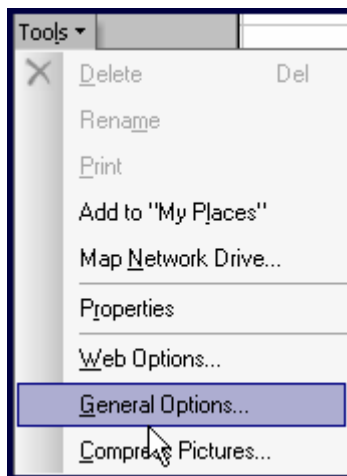
(V) Protect Worksheet or Workbook Elements

Protecting your workbook becomes essential once it is shared among multiple users so that someone cannot delete or change data in certain cells by accident. Nor can they insert/delete columns, among other things. To prevent anyone from accidentally or deliberately changing, moving, or deleting important data, you can protect certain worksheet or workbook elements, *with* or *without* a password. Excel passwords can be up to 255 letters, numbers, spaces, and symbols. You **must** type uppercase and lowercase letters correctly when you set and enter passwords.

Guard Workbooks with Passwords

It is simple but effective. If you know the correct password, you can open and/or modify the file. With an Excel workbook open, open **File** and click **Save As**.

In the Save As dialog box, select **Tools** on the toolbar, and click **General Options**.



Follow the directions below to decide level of security for your workbook.

Your Options to select level of security

In the Save Options dialog box, File Sharing area:

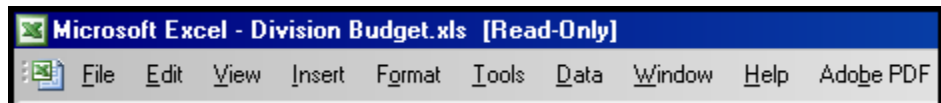
1. Type a password in the **Password to Open** text box to control who can open the workbook. **If you absolutely want no one to open your workbook without your permission (without password), use this option!**

2. Type a password in the **Password to Modify** text box to control who can modify contents. **Use this option and option #1 above combined when you desire to allow the user to open your workbook and make changes. By adding another password at this level provides an extra layer of security level to allow those only who have passwords to open and modify data. (*Leaving this password blank allows user who has password to open to make changes without your permission; adding a password effectively provides read-only access to those who do not have the password to modify.*)**

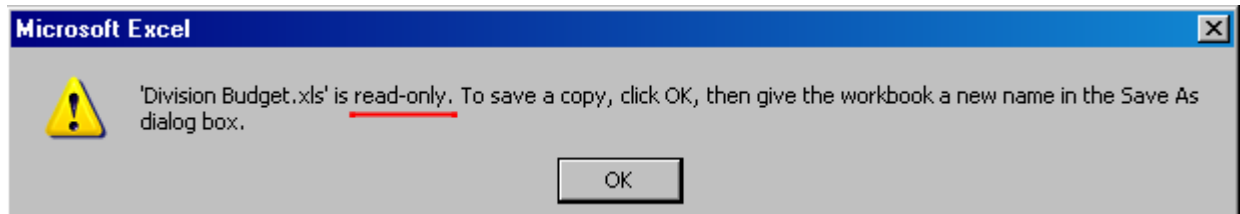
3. Select **Read-only Recommended** to prevent changes without requiring a password. **By checking this option combined with options #1 and #2 above will give those who have both passwords to view and modify to work with workbook freely. For those users who only have password to view workbook as 'read only' will be given a notice box that says "enter password for write access, or open read only" as shown below.**



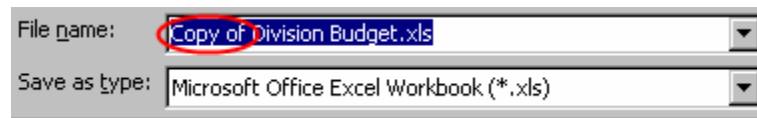
When user clicks on Read Only, the workbook opens with filename attached by [Read Only] in brackets at the end. See below.



If those users with 'read only' access try to modify and save the document, Excel warns the user to save the workbook under a different name by using "save as" option. See below.



By clicking "OK" Excel will automatically create a new workbook with the name begins with "copy of....." in Save As Dialog box. See below.



Removing a Password

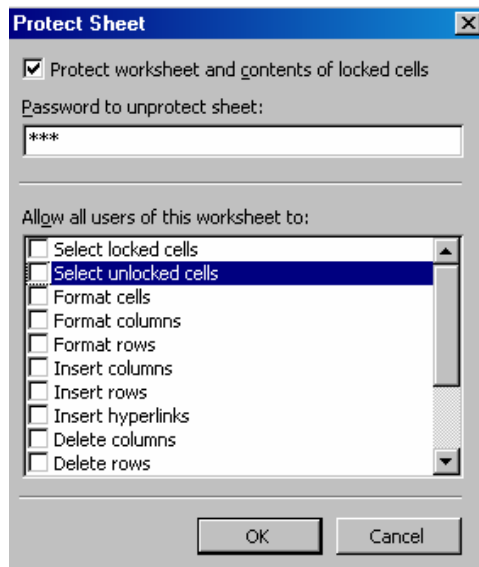
Only the originator of a file can remove its passwords and thereby turn off access controls.

1. Open **File** and click **Save As**.
2. In the Save As dialog box, select **Tools** on the toolbar, and click **General Options**. In the Save Options dialog box, delete the password(s) in the text boxes whose controls you want to remove.
3. Click **OK** and then click **Save**. Click **Yes** to replace the existing file.

(VI) Protect Worksheet Elements

Worksheet protection applies *only* to the currently active worksheet. To protect all elements that can be protected:

1. Open **Tools**, point at **Protection**, and click **Protect Sheet**.
2. Ensure that the **Protect Worksheet and Contents of Locked Cells** check box is selected. Optionally, type a password to unprotect the worksheet.
3. Deselect all check boxes in the **Allow All Users of This Worksheet To** list box, and click **OK**. If necessary, confirm the password and click **OK**. **By doing so no one will be able to modify your worksheet.**

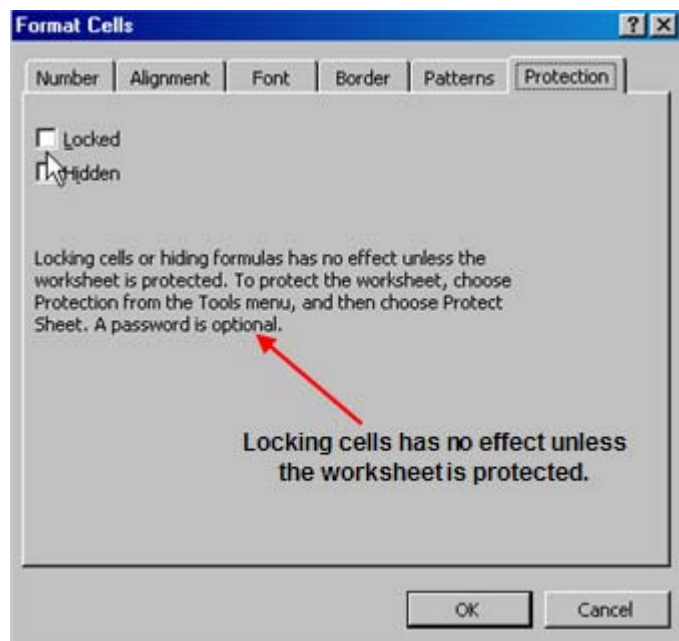


If you desire to allow users to modify data in **certain elements** of your worksheet, you can selectively protect worksheet elements. For example, if you want to allow other family members to input data in your *Total Budget worksheet* of the **PersonalBudget.xls** workbook but do not want them to modify any other part of the worksheet such as cells that contain formulas, for example, do the followings.

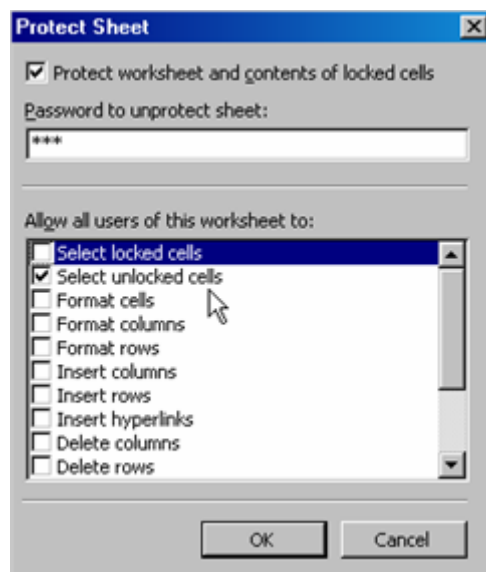
1. Select the range of cells they can input data. In this example, let's try on income data cells - B5 through M7, where they will place values of income figure, are selected first.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Personal Budget													
2														
3		Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
4	Income													
5	Wages	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	Interest/dividends	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	Miscellaneous	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	Income totals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Open **Format**, point at **Cells**, and click **Protection**. By default, **Locked** check box is always checked. That means all cells are generally locked. You want to clear the **Locked** check box *for those selected range of cells above* so click OK below.



2. Open **Tools**, point at **Protection**, and click **Protect Sheet**.
3. Ensure the **Protect worksheet and contents of locked cells** check box is selected. Optionally, type a password to unprotect the worksheet.
4. In the **Allow users of this worksheet to** list box, select the worksheet elements and actions you want the user to be able to perform. In this example, assume you will only let other family members to input data into those blue ranged cells selected in step 1. Make sure to clear all remaining boxes except **select unlocked cells** box. See below. Click **OK**. If necessary, confirm the password and click **OK**.

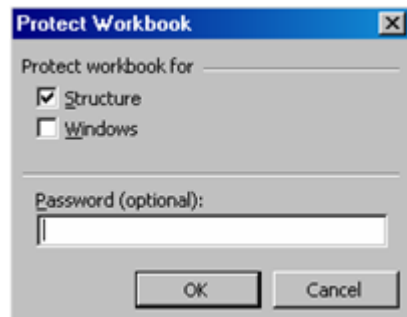


By protecting the worksheet like this, only those unlocked cells can be edited.

(VII) Protect Workbooks

This option is used to protect the structure of a workbook and to keep workbook windows in the same size and position each time the workbook is opened.

1. Open, **Tools**, point at **Protection**, and click **Protect Workbook**.



- Select **Structure** to prevent changes to non-content aspects of the workbook, which include viewing hidden worksheets; inserting, moving, deleting, renaming, or hiding worksheets; and moving and copying worksheets and more.
 - Select **Windows** to prevent resizing and repositioning workbook windows.
2. Optionally, enter a password. Click **OK**. If necessary, confirm the password and click **OK** again.

Exercises

Exercise 1

Linking Data from Several Worksheets

1. Using the [PersonalBudget.xls](#) file, link *Income-Expense Yearly Report* worksheet to *Total Budget* worksheet for Home Expense for the month of January. (**Hint:** Find out what cell in your source data contains total expense figure for January. Then start placing links *from Income-Expense Yearly Report* worksheet.)
2. Copy your January Home Expense result in *Income-Expense Yearly Report* worksheet into February through December cells.
3. For practice, link each expense category in *Income-Expense Yearly Report* worksheet to appropriate cell in *Total Budget* worksheet. Try placing actual Dollar figures in *Total Budget* and see the *Income-Expense Yearly Report* worksheet updates instantly.
4. For more practice, link each category under Daily Living Expense from *Total Budget* worksheet to appropriate cells in *Daily Living Expense* worksheet.

Exercise 2

Linking Data from one Workbook to another

Link February financial assistance figure from [FinancialAssistance.xls](#) workbook to [PersonalBudget.xls](#) workbook. (**Hint:** Open **PersonalBudget.xls** workbook, starting from selecting the cell C103 to incorporate total February financial assistance from **FinancialAssistance.xls** workbook. Type '=' sign in that cell and continue the remaining steps. You may also copy cell B103 to C103 and so on through the month of December.)

Exercise 3

Creating a Drop-Down List

Open [Drop-Down List.xls](#) workbook and activate *List* worksheet in the workbook. Select cell range E2:E14 and name that range of cells as 'Holiday'. Then click on *Timesheet* worksheet in the workbook and create a list for all those cells under *Holiday Type* column except for those cells that show Sub Total and Total figures. (**Hint:** Select range of cells to attach list of holidays on each cell or you may select individual cells to do so. Go to **Data>Validation** and select **List** from the **Allow** box. In **Source** box, type in '=' equal sign and **Holiday (The name of the range of cells that list all holidays on *List* worksheet.)**)

Also create a warning if someone tries to enter an invalid value in any of these cells. (**Hint:** In **Data Validation** box, under **Settings** tab, make sure to uncheck **ignore blank** box. By doing so will prevent the user to input any value except from the list. Click on **Error Alert** tab and put in appropriate **warning** and **Error message**. Click **Ok.**) Try to place any invalid value in those cells and see what happens. **Note:** If you create wrong list or warning messages, click on "clear all" in **Data Validation** box under each tab.

Exercise 4

Protect Worksheet Elements

Open [PersonalBudget.xls](#) and activate *Total Budget* worksheet. Protect the worksheet except for those cells (B5:M7) range where income figures can be put in. (**Hint:** Select those cell ranges first, go to **Format>Cells>Protection** and uncheck the **Locked** box and continue the remaining steps to protect the entire worksheet. *Remember locking or unlocking cells has no effect unless the worksheet is protected.*)