

FIT1013 Digital Futures: IT for Business  
Week 4: Developing an Excel Application  
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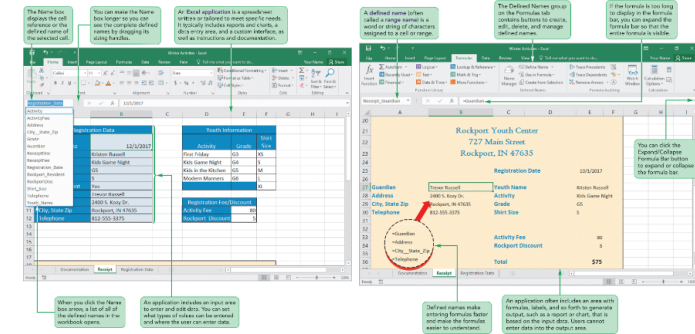
On completion of your study this week, you should aim to:

- Create an Excel application
- Use defined names in formulas
- Create validation rules for data entry
- Learn about macro viruses and Excel security features
- Create and run a macro
- Edit a macro using the Visual Basic Editor
- Assign a macro to a keyboard shortcut and a button
- Save and open a workbook in macro-enabled format

Reference: Excel 2016, Module 7



## Visual Overview: Excel Application and Defined Names



The Name box displays the cell reference or the defined name of the selected cell.

You can make the Name box larger so you can see the complete defined name by dragging its bottom edge.

An Excel application is a spreadsheet or related to meet specific needs. It typically includes reports and charts, a data entry area, and a custom interface, as well as macros and documentation.

A defined name is a name assigned to a cell or range.

The Defined Names group in the Name Manager contains buttons to create, delete, and manage defined names.

The formula bar displays the formula entered in the active cell. If the formula is too long to display, you can expand the formula bar by clicking the expand/collapse button.

When you click the Name box, a list of all defined names in the workbook appears.

An application often includes an input area for data entry and calculation. You can use the input area to enter data and make the formulas calculate the output.

Defined names make it easier to create formulas and make the formulas easier to understand.

An application often includes an area with formulas, charts, and so forth, to generate the output. The output area is based on the input data. Users cannot enter data into the output area.

Reference : Module 7, NP Perspectives Excel 2016

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## Planning an Excel Application

- An Excel application is a spreadsheet written or tailored to meet specific needs
- Planning includes designing how the worksheet(s) will be organized; you can:
  - Enter and edit data (setting where and what types of data can be entered)
  - Store data after it has been entered
  - Use formulas to manipulate and perform calculations on data
  - Display outputs, such as reports and charts

## Naming Cells and Ranges

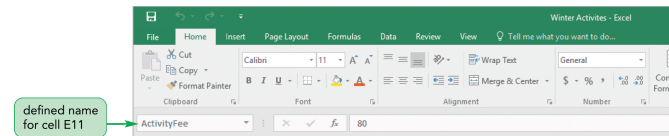
- Cell and range references do not indicate what data is stored in those cells
- You can use a **defined name** to assign a meaningful, descriptive name to a cell or range
- A **defined name** enables you to quickly navigate within a workbook to the cell or range with the defined name
- You can use defined names to create more descriptive formulas

## Naming Cells and Ranges

- Rules for naming cells or ranges
  - Must begin with a letter or \_
  - Can include letters and numbers as well as periods and underscores, but not other symbols or spaces
  - Use an underscore between the words or capitalize the first letter of each word
  - Cannot be a valid cell address, function name, or reserved word
  - Can include as many as 255 characters
  - The name is not case sensitive

## Naming Cells and Ranges

- Using the **Name Box** to Create Defined Names
  - The Name box is a quick way to create a defined name for a selected cell or range



## Naming Cells and Ranges

- Selecting Cells and Ranges by Their Defined Names
  - The **Name box** displays all of the defined names in a workbook
  - Click a name in the Name box list to quickly select the cell or range referenced by that name

## Naming Cells and Ranges

- Creating Defined Names by Selection
  - Quickly define names without typing them if the data is organized as a **structured range of data** with labels in the first or last column, or in the top or bottom row
  - Defined names are based on the row or column labels



## Validating Data Entry

- To ensure that correct data is entered and stored in a worksheet, you can use data validation
- Each **validation rule** defines criteria for the data that can be entered and stored in a cell or range
- You can add input and error alert messages for the user to that cell or range
- You specify the validation criteria, the input message, and the error alert for the active cell in the Data Validation dialog box

## Validating Data Entry

- Specifying Validation Criteria
  - When creating a validation rule, you specify the type of data that is allowed as a list or range of acceptable values (called **validation criteria**)

Type	Acceptable Values
Any value	Any number, text, or date; removes any existing data validation
Whole Number	Integers only; you can specify the range of acceptable integers
Decimal	Any type of number; you can specify the range of acceptable numbers
List	Any value in a range or entered in the Data validation dialog box separated by commas
Date	Dates only; you can specify the range of acceptable dates
Time	Times only; you can specify the range of acceptable times
Text Length	Text limited to a specified number of characters
Custom	Values based on the results of a logical formula

## Validating Data Entry

- Creating an **Error Alert Style** and **Message**
  - An error alert determines what happens after a user tries to make an invalid entry in a cell that has a validation rule defined
  - The three error alert styles are:
    - **Stop:** Prevents the entry from being stored in the cell
    - **Warning:** Prevents the entry from being stored in the cell unless the user overrides the rejection and decides to continue using the data
    - **Information:** Accepts the data value entered, but allows the user to choose to cancel the data entry

## Validating Data Entry

- Creating an **Input Message**
  - One way to reduce the chance of a data-entry error is to display an input message when a user makes the cell active
  - An input message provides additional information about the type of data allowed for that cell
  - Input messages appear as ScreenTips next to the cell when the cell is selected
  - Can add an input message to a cell even if you don't set up a rule to validate the data in that cell

## Validating Data Entry

- Creating a **List Validation Rule**
  - Use the data validation feature to restrict a cell to accept only entries that are on a list you create
  - Create the list of valid entries in the Data Validation dialog box or use a list of valid entries in a single column or row
  - Once you create a list validation rule for a cell, a list box with the possible values appears when the user selects the cell

## Validating Data Entry

- Testing Data Validation Rules
  - Test validation rules by entering incorrect values that violate the validation rules
  - The only way an error occurs in cells that have a list validation is if an incorrect entry is typed or pasted in the cell
  - Entering invalid data will ensure that validation rules work as expected

## Types of data entry messages available

Icon	Type of Alert	Label on Button	Action If Button Clicked
	Warning	Continue Yes	value entered in cell; processing continues
		Continue No	value entered in cell; Excel stops, waiting for you to enter another value
		Cancel	value not entered in cell
	Information	OK	value entered in cell
		Cancel	value not entered in cell
	Stop	Retry	
		Cancel	

## Data Validation

OPTIONS IN THE ALLOW LIST BOX	
ALLOW	DESCRIPTION
Any Value	Any value can be entered into the cell.
Whole Number	The cell will accept only integers. A validation rule can further specify the range of acceptable integers.
Decimal	The cell will accept any type of numeric value. A validation rule can further specify the range of acceptable values.
List	The cell will accept only values from a list. The list can be taken from a range of cells in the worksheet, or the list of values can be entered directly into the dialog box, with the values separated by commas.
Date	The cell will accept only dates. A validation rule can further specify the range of acceptable dates.
Time	The cell will accept only times. A validation rule can further specify the range of acceptable times.
Text Length	The cell will accept only text of a specified number of characters.
Custom	The validation rule will be based on an Excel logical formula.

## Data Validation

The screenshot illustrates the steps to set up data validation in Excel. It shows three dialog boxes: 'Data Validation' (Allow: List, Source: =B2:B100), 'Show input message' (Title: Activity, Input message: Click the arrow to select the Activity), and 'Show error alert' (Title: Invalid Activity, Error message: An invalid activity has been entered. Click Cancel, and then use the arrow to select a valid Activity). Red arrows point from these dialog boxes to the corresponding cells in the worksheet, which contains a list of activities in column B.

## MARS

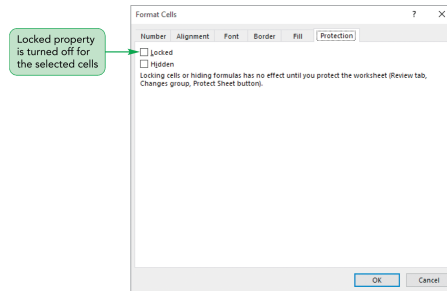
## Protecting a Worksheet and a Workbook

- Another way to minimize data-entry errors is to limit access to certain parts of the workbook
- Worksheet protection** prevents users from changing cell contents, such as editing formulas in a worksheet
- Workbook protection** also prevents users from changing the workbook's organization, such as inserting or deleting worksheets in the workbook
- You can keep users from viewing the formulas used in the workbook

## Protecting a Worksheet and a Workbook

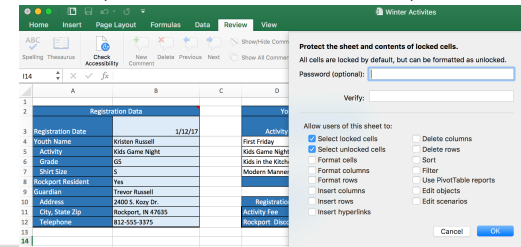
- Locking and Unlocking Cells**
  - Every cell in a workbook has a **locked property** that determines whether changes can be made to that cell
  - The locked property has no impact as long as the worksheet is unprotected
  - After you protect a worksheet, the locked property controls whether the cell can be edited
  - Unlock a cell by turning off the locked property
  - By **default**, the locked property is turned **on** for each cell, and worksheet protection is turned **off**

## Protecting a Worksheet and a Workbook



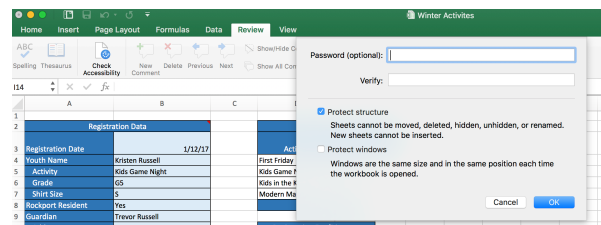
## Protecting a Worksheet and a Workbook

- Protecting a **Worksheet**
  - When you set up worksheet protection, you specify which actions are still available to users in the protected worksheet
  - You can limit the user to selecting only unlocked cells, or allow the user to select any cell in the worksheet; these choices remain active as long as the worksheet is protected
  - A protected worksheet can always be unprotected
  - You can add a password that must be entered to turn off the protection



## Protecting a Worksheet and a Workbook

- Protecting a **Workbook**
  - Worksheet protection applies only to the contents of a worksheet, not to the worksheet itself
  - To keep a worksheet from being modified, you need to protect the workbook
  - You can protect both the structure and the windows of a workbook
  - Protecting the structure prevents users from renaming, deleting, hiding, or inserting worksheets

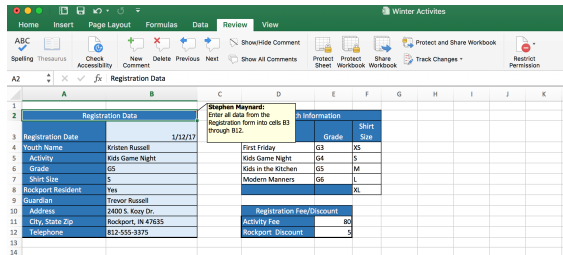


## Protecting a Worksheet and a Workbook

- Unprotecting** a Worksheet and a Workbook
  - You can turn off worksheet protection at any time
  - You must unprotect a worksheet to edit its contents
  - You can unprotect the workbook
  - If you need to insert a new worksheet or rename an existing worksheet, you can unprotect the protected workbook, make the changes to the structure, and then reapply workbook protection

## Inserting Comments

- Comments are often used in workbooks to:
  - Explain the contents of a particular cell, such as a complex formula
  - Provide instructions to users
  - Share ideas and notes from several users collaborating on a project
- If you collaborate on a workbook, the top of the comment boxes would show the name of each user who created that comment
- A small red triangle appears in the upper-right corner of a cell with a comment
- The comment box appears when you point to a cell with a comment



## MARS

## Tutorial Activities

- Learn about macro viruses and Excel security features
- Create and run a macro
- Edit a macro using the Visual Basic Editor
- Assign a macro to a keyboard shortcut and a button
- Save and open a workbook in macro-enabled format

## Summary

- Excel application
- Defined names in formulas
- Validation rules for data entry
- Excel security features
- Excel Macros
- Homework
  - Go through Excel Tutorial 7
  - Attempt Quiz
- Next week
- Fundamentals of Programming – Excel VBA