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
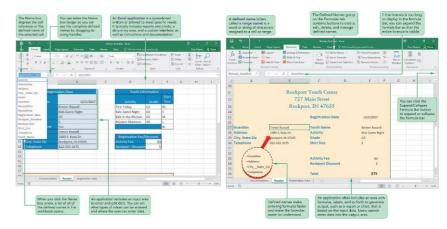
Reference: Excel 2016, Module 7

Visual Overview: Excel Application and Defined Names

Reference : Module 7, NP Perspectives Excel 2016

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

defined name for cell E11

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

Naming Cells and Ranges

- Editing and Deleting Defined Names
  - The Name Manager dialog box lists all of the names currently defined in the workbook, including Excel table names
  - In addition to the name, it identifies the current value for that name as well as the worksheet and cell or range it references
  - Use the Name Manager dialog box to create a new name, edit or delete existing names, and filter the list of names

Using Defined Names in Formulas

- Defined names make formulas simpler to enter and understand
- To use a defined name in a formula:
  - Enter the formula as usual
  - As you type a defined name in a formula, the Formula AutoComplete box appears, listing functions and defined names that begin with the letters you typed
  - You can double-click the name you want in the Formula AutoComplete box or press the Tab key

Using Defined Names in Formulas

- Adding Defined Names to Existing Formulas
  - You might name cells after creating formulas in the worksheet or you might not use the names
  - Because defined names are not automatically substituted for the cell addresses in a formula, you can replace cell addresses in existing formulas in the worksheet with their defined names to make the formulas more understandable
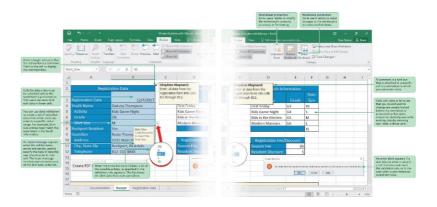
Visual Overview: Data Validation and Protection

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
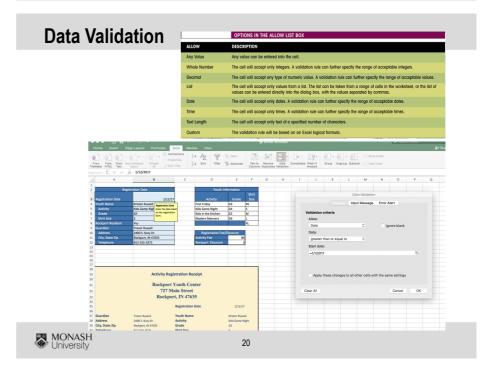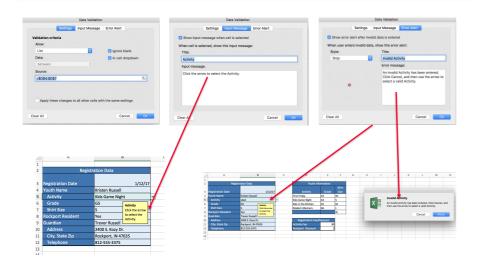
Validating Data Entry

- 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

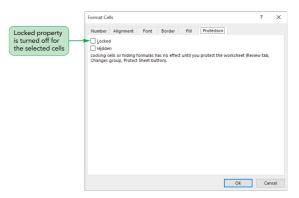| Icon	Type of Alert	Label on Button	Action If Button Clicked
⚠️	Warning	Continue Yes	value entered in cell; processing continues
		Continue No	value entered in cell; Excel stops, waiting for you to enter another value
		Cancel	value not entered in cell
ℹ️	Information	OK	value entered in cell
		Cancel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

Data Validation

Data Validation

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

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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
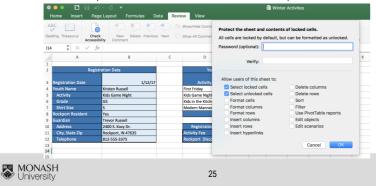

Locked property is turned off for the selected cells

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
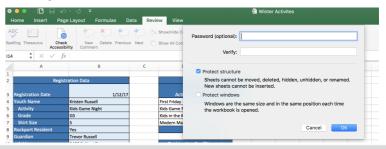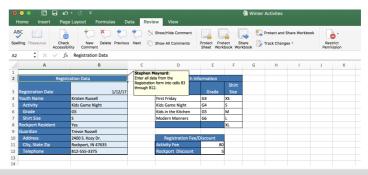
Protecting a Worksheet and a Workbook

- **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

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

- Next week
- Fundamentals of Programming – Excel VBA