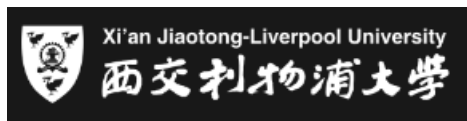


Excel VBA 程序设计基础

Excel VBA Programming Basics

Office Software Skills, Nov 9th 7-9pm

Hang Dong | 董行, CSSE



Acknowledgement to all resources used in this presentation: they are for educational use only.

上课之前

Before the class

- ▶ Let me know about you
 - ▶ Chinese or English?
 - ▶ Prior knowledge in programming?
 - ▶ Prior knowledge in Excel (functions, charts, pivotTables)?
 - ▶ Prior knowledge in VB (Microsoft Visual Basics)?
 - ▶ Prior knowledge in **Excel VBA**?
 - ▶ Know nothing above? (小白?)

- ▶ It doesn't matter~~~

什么是 VBA 和 宏: What is VBA and Macro

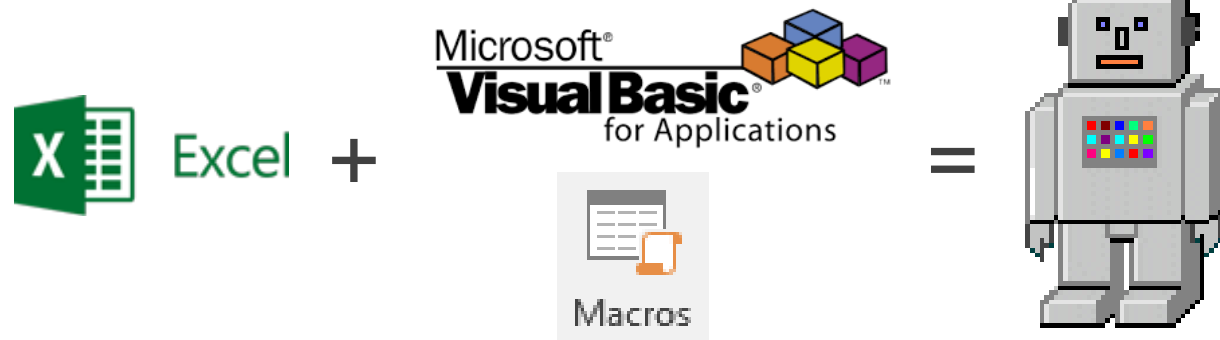
VBA, Visual Basics for Applications

简而言之, VBA是微软创造的一种编程语言, 方便用户来自动地控制Excel等工具。

In a nutshell, it is a program language developed by Microsoft for users to customise and automate tools like Excel.

用Excel VBA语言写出来的指令或操作过程, 称为宏, 即巨大的、可重复的操作。

Commands or operations written by Excel VBA are called Macros, which mean large and repeatable operations.



Robot icon in Wikimedia, CC BY-SA 3.0,
<https://commons.wikimedia.org/wiki/Robot#/media/File:Animation2.gif>

Advantage & disadvantages for VBA

Advantages:

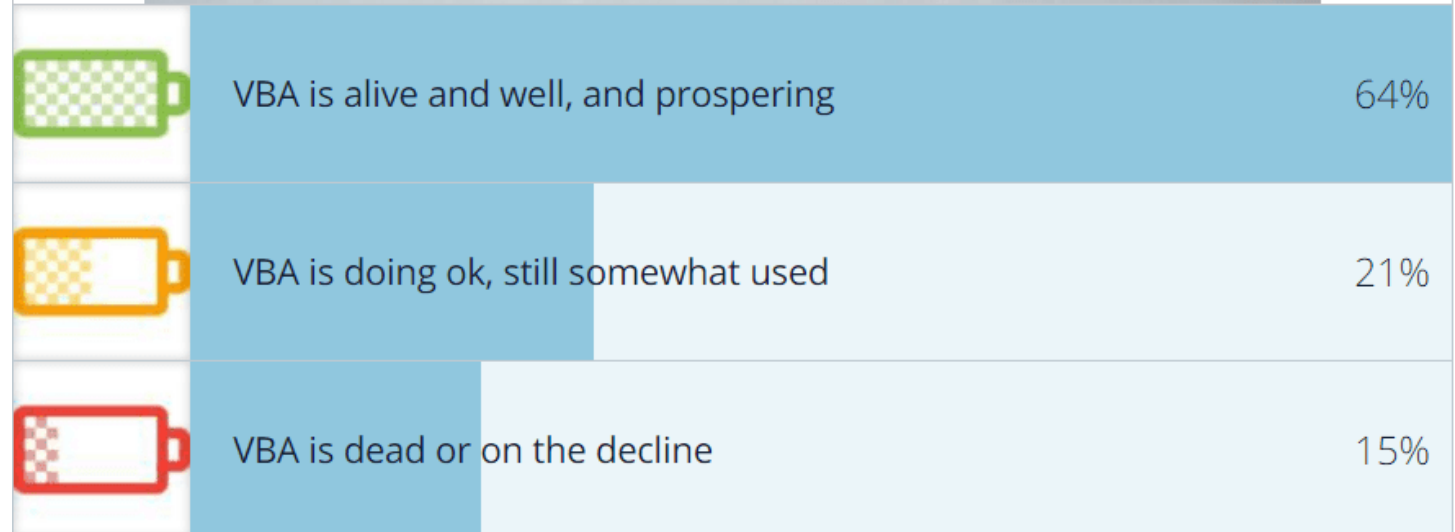
- ▶ 省时省力处理数据 Saving time for your tasks
- ▶ VBA自带安装在Excel中 Not need to install
- ▶ 在办公领域(尤其是金融会计领域)非常流行 Popular in Finance, accounting...

Disadvantages:

- ▶ VBA很强大, 但不总是最佳方式 Powerful, but not always the optimal approach.
- ▶ 你需要学习, 虽然不难 You need to learn about coding, fortunately not hard
- ▶ VBA跨版本的兼容性不强, 在提升 Compatibility across versions is not strong

Excel VBA is still prospering

- ▶ A survey in 2016 shows that VBA is alive, well and prospering.
- ▶ Acknowledgement to an image in ANALYSTCAVE. VBA IS DEAD? WHAT'S THE FUTURE OF VBA?. 2016.2. <http://analystcave.com/vba-dead-whats-future-vba/>



Excel VBA 适用于哪类问题?

What problems can Excel VBA solve?

任何对Excel自动化的任务 Tasks related to automating some parts of Excel

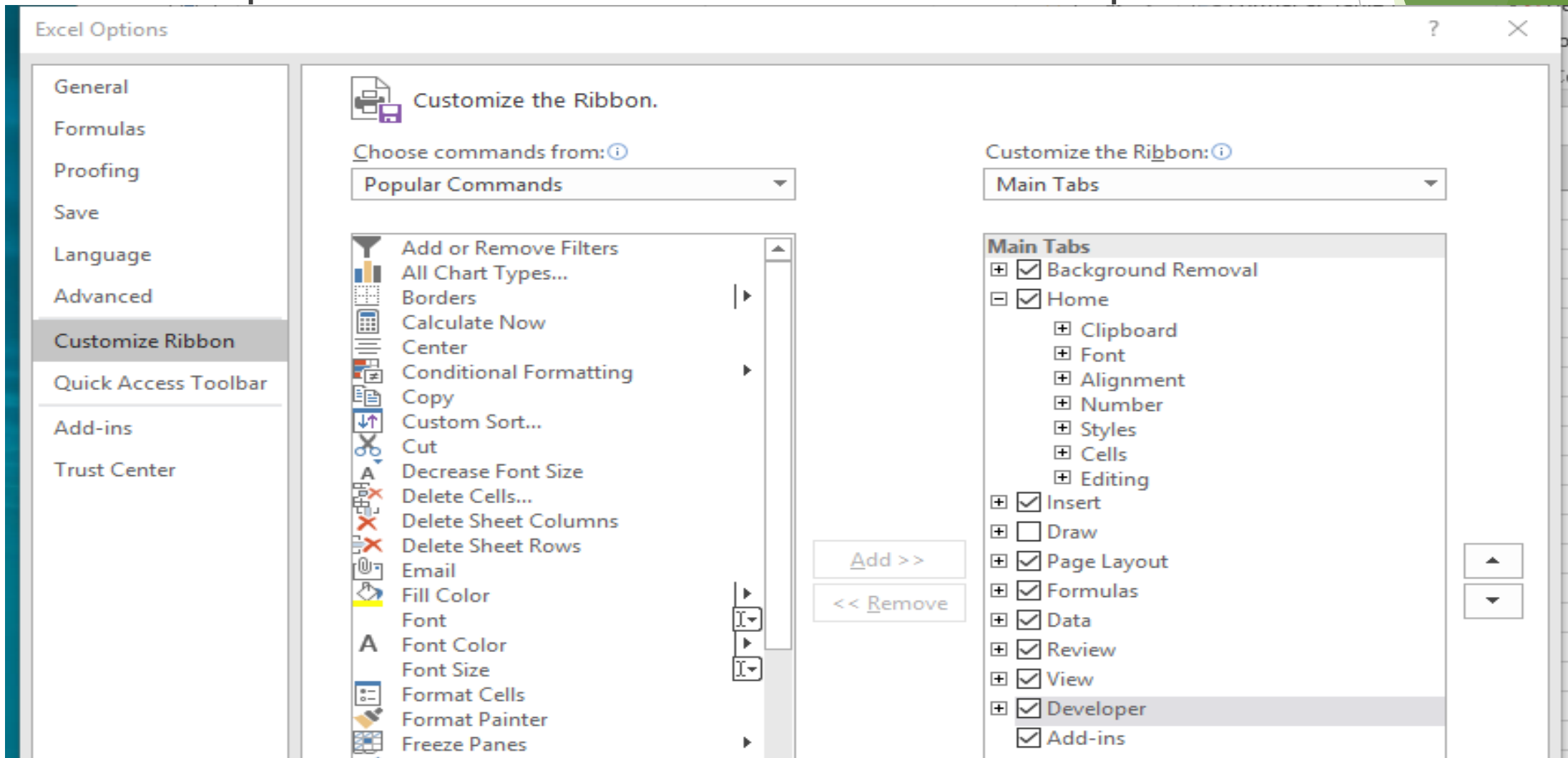
- ▶ 需要大量重复工作的任务, 不止于 Repeated tasks not limited to,
 - ▶ 批量文本的格式化处理 Text formatting
 - ▶ 批量单元格, 表, 工作簿的处理 Cell, sheet and workbook processing
 - ▶ 批量图表、报告的生成 Charts and Reports generation
 - ▶ 批量数据的导入、加工和导出 Data import, processing and export
- ▶ 增强Excel的用户交互 Extension to User Interaction
- ▶ Office 中各类应用之间的交互 Interaction between Office Applications
- ▶ 创建Add-in加载项和Ribbon选项卡 [本节课不涉及] Create custom add-ins and Ribbon Tabs. [not be covered today]
- ▶ 其实什么都可以做...比如小型的信息管理系统 或者 游戏 Actually much more than you can imagine...such as small information management system or a game.

主要内容 Content

- ▶ 如何编写 Excel VBA 代码? How to use Excel VBA to solve problems?
 - ▶ 变量 Variables
 - ▶ 对象, 属性和方法 Objects (Cell, Range, Sheet), Properties and Actions
 - ▶ 基本语法: 循环和控制 Basic Syntax: Loop and Control
 - ▶ 基本应用: 数据的整合, 导入和格式化 Basic Applications: data aggregation, import/export data, data formatting
- ▶ 如何学习? How/Where to learn more about Excel VBA?
 - ▶ 录制宏 Recording Macro
 - ▶ 调试 Debugging
 - ▶ 查找相关的资料 Looking for tutorials online and books

新技能·开：启用开发工具 Enable “Developer”

- File -> Options -> Customize Ribbon -> Tick Developer



► Enable all macros (not necessary)

The image shows the 'Excel Options' dialog box with the 'Trust Center' category selected in the left-hand navigation pane. The main area displays the 'Microsoft Excel Trust Center' section, which includes a warning icon and text: 'Help keep your documents safe and your computer secure and healthy.' Below this, there is a 'Security & more' section with a link to 'Microsoft Trustworthy Computing'. A 'Trust Center Settings...' button is visible on the right. In the foreground, a smaller window titled 'Trust Center' is open, showing a list of settings on the left and 'Macro Settings' on the right. Under 'Macro Settings', the option 'Enable all macros (not recommended; potentially dangerous code can run)' is selected with a radio button and is highlighted with a dashed border. Other options include 'Disable all macros without notification', 'Disable all macros with notification', and 'Disable all macros except digitally signed macros'. Below the macro settings is the 'Developer Macro Settings' section.

Excel Options

General
Formulas
Proofing
Save
Language
Advanced
Customize Ribbon
Quick Access Toolbar
Add-ins
Trust Center

Help keep your documents safe and your computer secure and healthy.

Security & more

Visit Office.com to learn more about protecting your privacy and security.

[Microsoft Trustworthy Computing](#)

Microsoft Excel Trust Center

The Trust Center contains security and privacy settings. These settings help keep your computer secure. We recommend that you do not change these settings.

Trust Center Settings...

Trust Center

Trusted Publishers
Trusted Locations
Trusted Documents
Trusted Add-in Catalogs
Add-ins
ActiveX Settings
Macro Settings

Macro Settings

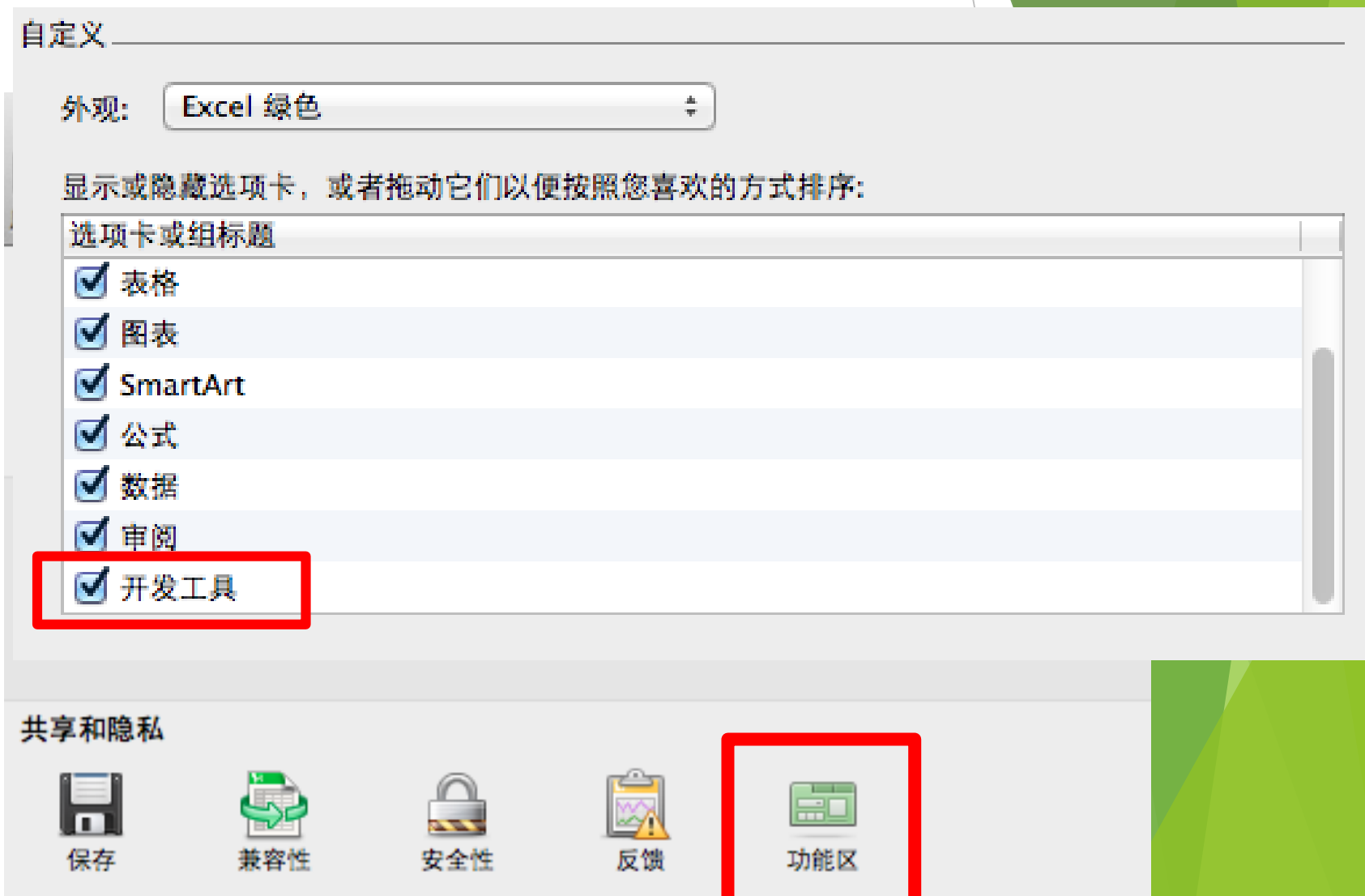
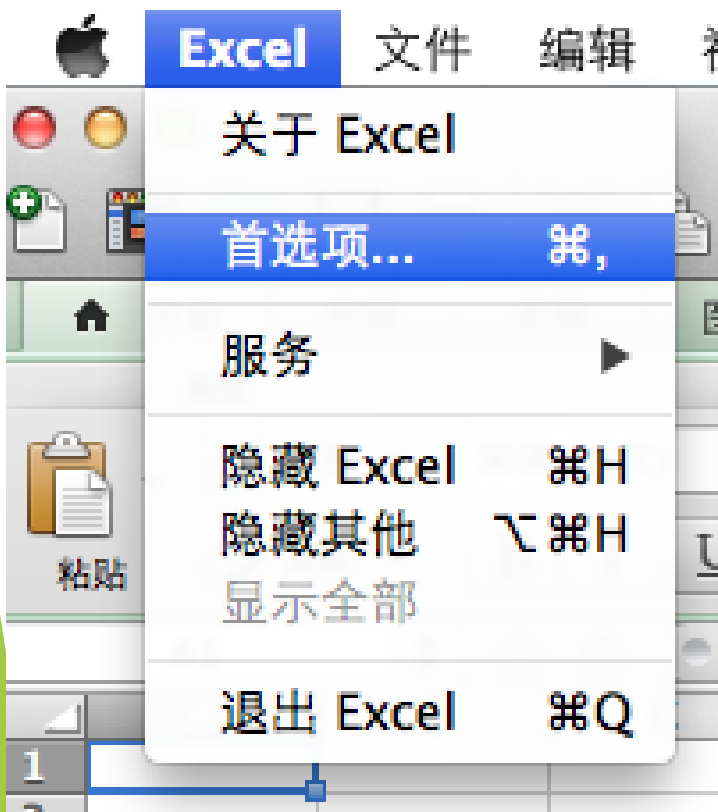
Disable all macros without notification
 Disable all macros with notification
 Disable all macros except digitally signed macros
 Enable all macros (not recommended; potentially dangerous code can run)

Developer Macro Settings

Enable “Developer” for mac Office 2016

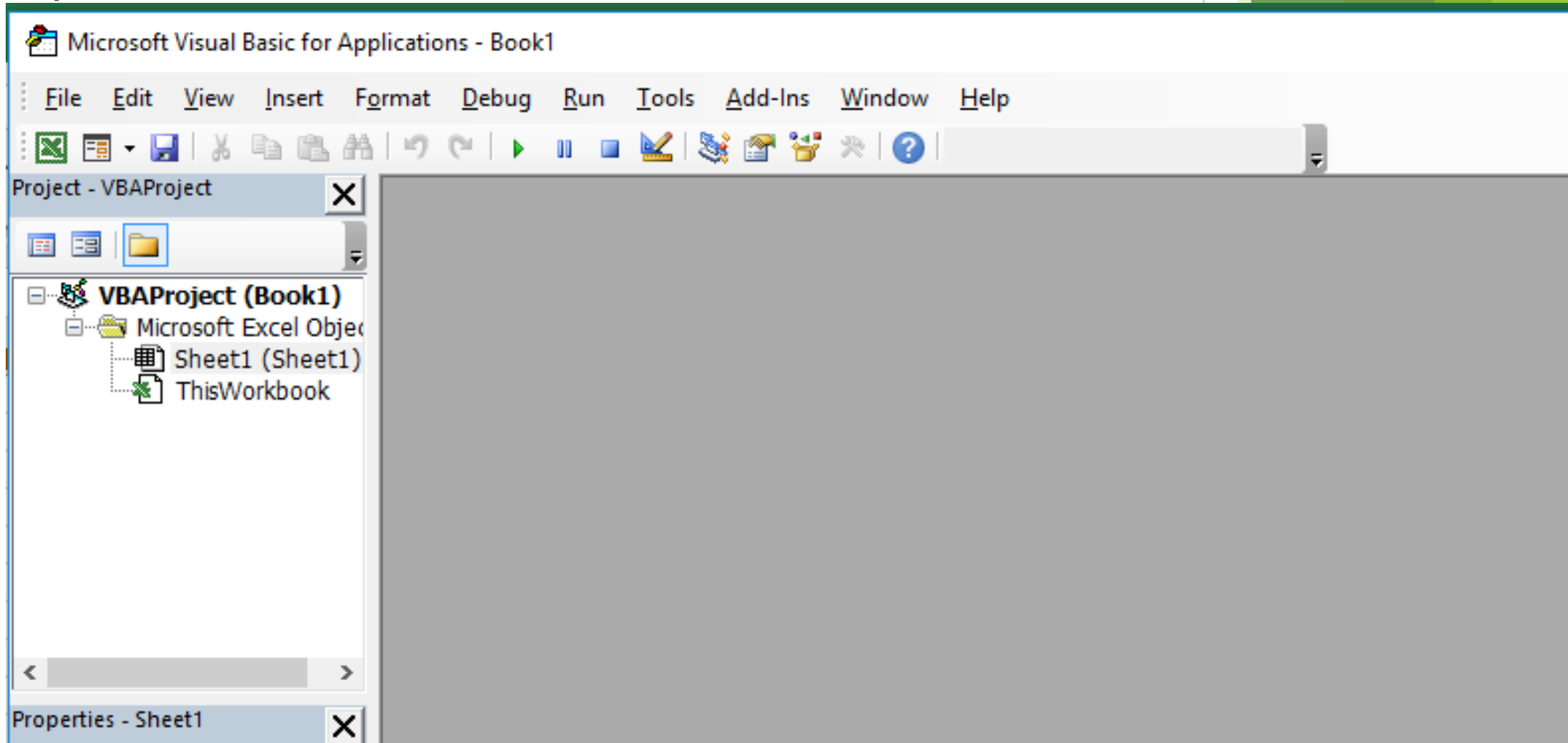


Enable “Developer” for mac Office 2011



VBE (Visual Basic Editor)

- ▶ Developer Ribbon -> Visual Basic



Common Shortcuts in VBE in Windows

- ▶ Open VBE in Excel: Alt+F11
- ▶ 属性窗口 Properties: F4
- ▶ 对象浏览器 Object Browser: F2, Shift+F2
- ▶ 帮助文档 Help Document: F1
- ▶ 逐行调试 Step Into Debugging: F8
- ▶ 设置断点 Toggle Breakpoint: F9

第一个程序 The first program

- ▶ “Hello World”
- ▶ 通过按钮1，在第一个工作表的单元格“A1”上显示”Hello World!”.
- ▶ Show “Hello World!” on cell A1 in the first Sheet through Button1.
- ▶ 通过按钮2，在Excel中弹出”Hello World!”.
- ▶ Pop dialog box “Hello World!” through Button2.
- ▶ hello_world.xlsm

录制宏

The 1st programme: Recording Macro

- ▶ 录制宏 Recording Macro
- ▶ 测试宏 Testing Macro
- ▶ 检查/学习宏 Examining the Macro / Learn from the Macro code
- ▶ 修改宏 Modify the Macro
- ▶ 保存宏 Saving the Macro

录制宏 Recording Macro

- ▶ Developer -> Record Macro -> Set shortcut -> OK
- ▶ Performing some operations
- ▶ Stop Recording

测试宏 Testing Macro

- ▶ 打开新的工作表，运行刚刚录制的宏

Run the recorded Macro on a new worksheet

- ▶ **Method 1:** 用快捷键运行 Ctrl + h Using the Shortcut Ctrl + h
- ▶ **Method 2:** 创建新的按钮来运行这个宏 Insert a button on the sheet to run the Macro
- ▶ **Method 3:** 直接在VBE中运行 Run it directly in VBE

检查/学习宏 Examining the Macro / Learn from the Macro code

- ▶ 打开VBE环境编辑器，查看生成的宏代码

Check Macro Code in VBE.

- ▶ 天啦噜！右边这一串是什么意思呢？

Oh!!! What does these mean on the right?

绿色部分不执行哦，只是注释

The green part does not execute: It is notes.

```
Sub enter_hello_world()  
.  
' enter_hello_world Macro  
.  
' Keyboard Shortcut: Ctrl+h  
.  
ActiveCell.FormulaR1C1 = "Hello World!"  
Range("A1").Select  
With Selection.Interior  
    .Pattern = xlSolid  
    .PatternColorIndex = xlAutomatic  
    .Color = 49407  
    .TintAndShade = 0  
    .PatternTintAndShade = 0  
End With  
End Sub
```

修改宏 Modify the Macro

- ▶ 我们来一起加几行代码

Let put some new lines of code

- ▶ Add “**For i=1 To 10**” under Sub XX()
- ▶ Add “**Next i**” just before End Sub
- ▶ Change Range(A1).Select to

Range(“A & i”).Select

- ▶ Run it!

	A
1	Hello World!
2	Hello World!
3	Hello World!
4	Hello World!
5	Hello World!
6	Hello World!
7	Hello World!
8	Hello World!
9	Hello World!
10	Hello World!

```
Sub enter_hello_world()  
.  
' enter_hello_world Macro  
.  
' Keyboard Shortcut: Ctrl+h  
.  
' Modified by Hang  
  For i = 1 To 10 'I added this  
    Range("A" & i).Select 'I moved and modified this  
    ActiveCell.FormulaR1C1 = "Hello World!"  
    'Range("A1").Select 'It was here.  
    With Selection.Interior  
      .Pattern = xlSolid  
      .PatternColorIndex = xlAutomatic  
      .Color = 49407  
      .TintAndShade = 0  
      .PatternTintAndShade = 0  
    End With  
  Next i 'I added this  
End Sub
```

- ▶ 我们再来一起加几行代码

Let put some new lines of code

- ▶ Add “If i Mod 2 = 0” before With XX.XX
- ▶ Add “End If” just after End With

- ▶ Run it!

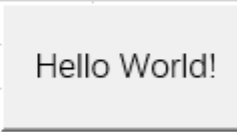
	A
1	Hello World!
2	Hello World!
3	Hello World!
4	Hello World!
5	Hello World!
6	Hello World!
7	Hello World!
8	Hello World!
9	Hello World!
10	Hello World!

```
Sub enter_hello_world()  
'  
' enter_hello_world Macro  
'  
' Keyboard Shortcut: Ctrl+h  
'  
' Modified by Hang  
    For i = 1 To 10 'I added this  
        Range("A" & i).Select 'I moved and modified this  
        ActiveCell.FormulaR1C1 = "Hello World!"  
        'Range("A1").Select 'It was here.  
        If i Mod 2 = 0 Then 'Then, I added this  
            With Selection.Interior  
                .Pattern = xlSolid  
                .PatternColorIndex = xlAutomatic  
                .Color = 49407  
                .TintAndShade = 0  
                .PatternTintAndShade = 0  
            End With 'Then, I added this  
        End If  
    Next i 'I added this  
End Sub
```

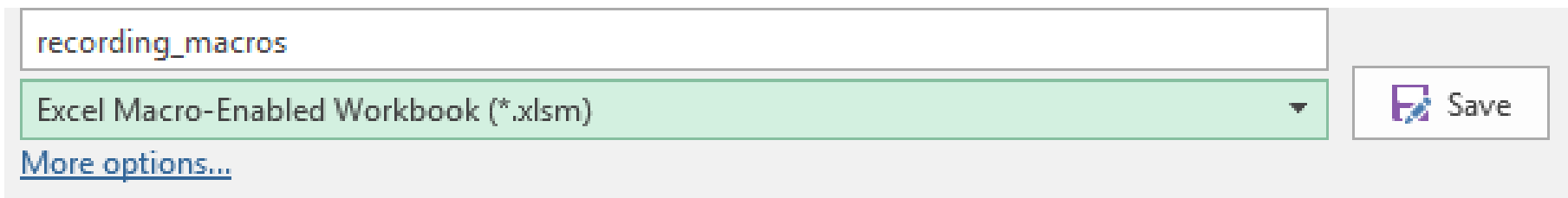
保存宏 Save the Macro

- ▶ Developer -> Insert -> Button (From Control)

	A	B	C	D
1	Hello World!			
2	Hello World!			
3	Hello World!			
4	Hello World!			
5	Hello World!			
6	Hello World!			
7	Hello World!			
8	Hello World!			
9	Hello World!			
10	Hello World!			



- ▶ File -> Save As -> set format as **.xlsm**



知识点1: Excel VBA 中的过程

Basic 1: Sub in Excel VBA

- ▶ 过程即执行任务的一组语句。A Sub(routine) procedure is a group of VBA statements that performs an action (or actions) with Excel.
 - ▶ Sub sub_name([parameters])
 - ▶ End Sub
- ▶ 从其它过程中调用某过程 Executing the procedure from another procedure
 - ▶ Call sub_name

知识点2: 对象、属性和方法

Basic 2: Objects, properties and actions

▶ 对象.方法/属性 Object.Action/Property

- ▶ Range("A1").Select ‘选择单元格A1 Select the Cell A1.
- ▶ ActiveCell.FormulaR1C1 ‘返回或设置指定对象的公式 Returns or sets the formula for the object.
- ▶ With-End With 结构

```
With Selection.Interior
    .Pattern = xlSolid
    .PatternColorIndex = xlAutomatic
    .Color = 49407
    .TintAndShade = 0
    .PatternTintAndShade = 0
End With
```

▶ 对象.对象 Object.Object

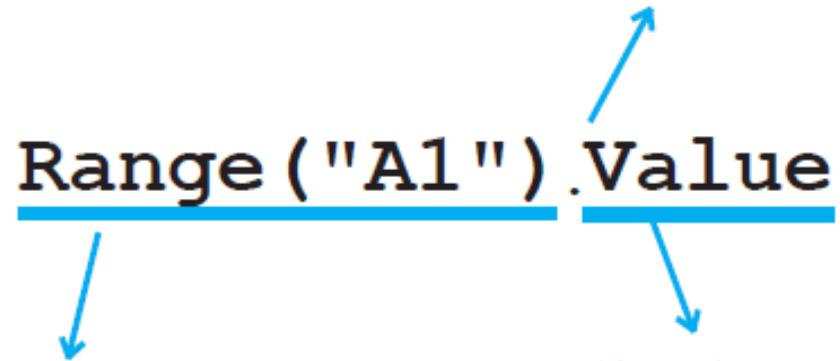
- ▶ Application.Selection ‘选中的对象 Returns the selected object in the active window for an Application object.
- ▶ Selection.Interior ‘单元格的内部 Returns an Interior object that represents the interior of the specified object

对象与属性 Object and properties

- ▶ Range对象的Value属性（单元格.内容）

对象和属性之间用点连接。

Range("A1").Value



对象：A1 单元格。

Value：单元格对象的属性，代表指定单元格的值。

类似有 Range("A1").Row（单元格.行数）

Range("A1").Column（单元格.列数）

Range("A1:B10").Count（单元格.数量）

对象与方法 Object and actions

► Range对象的Select方法

Select: 单元格对象的方法，表示在 A1 单元格上执行的是选择操作。

Range ("A1") . Select

类似还有

Range("A1").Clear

(单元格.清除内容和格式)

Range("A1").ClearContents

(单元格.清除内容但不清除格式)

[a1].copy destination:=[a2]

(单元格.复制到:=单元格)

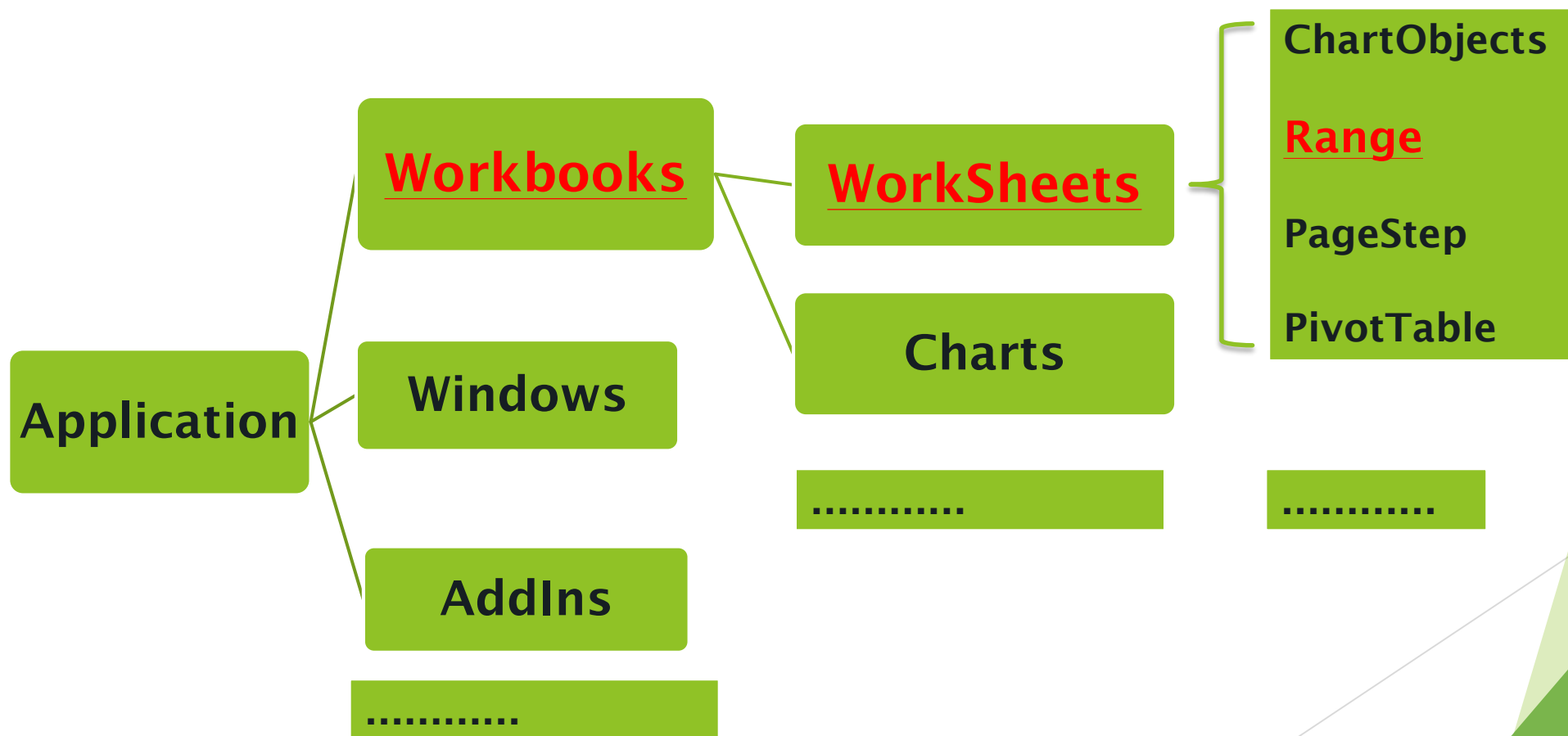
对象层次结构 Hierarchical Structure of Objects

Excel库下的类

Application类的对象

Workbooks类的对象

WorkSheets的对象



获取单元格并赋值 Access and set value to a Range/Cell on Excel VBA

- ▶ `Application.Workbooks("Book1").Worksheets(1).Range("A1").Value="I love VBA"`
- ▶ `ThisWorkbook.Worksheets(1).Range("A1").Value="I love VBA"`
- ▶ `Range("A1")="I love VBA"`
- ▶ `[A1]="I love VBA"`

知识点3: 基本的运算符

Basic 3: Basic Operators

- ▶ ‘赋值 ‘give a value
- ▶ `a = 3`
- ▶ `a = a+1`
- ▶ `Cells(1,2).Value = “Hello”`
- ▶ `Range(“A1”).Value = “Hello”`

- ▶ ‘加减乘除和求余
- ▶ `+, -, *, /, mod` `cells(1,1).Value = 17 mod 3`

- ▶ And, Or, Not
- ▶ `If a>3 Or b>3 then c=2`
- ▶ `If Not c=2 then c=3` ‘If `c<>2` then `c=3`
- ▶ `If Range(“A1”).Value <> “” AND Range(“B1”).Value <> “” then ...`

知识点4: 程序控制结构 之 判断与循环

Basic 4: Control Flow, Loop and Decision Structures

► 控制结构 Decision Structure (If-Then)

- ' Multiple-line syntax:
 - If condition [Then]
 - [statements]
 - [Elself elseifcondition [Then]
 - [elseifstatements]]
 - [Else
 - [elsestatements]]
 - End If
- Example: see “if_then_else_show discount.xlsm”

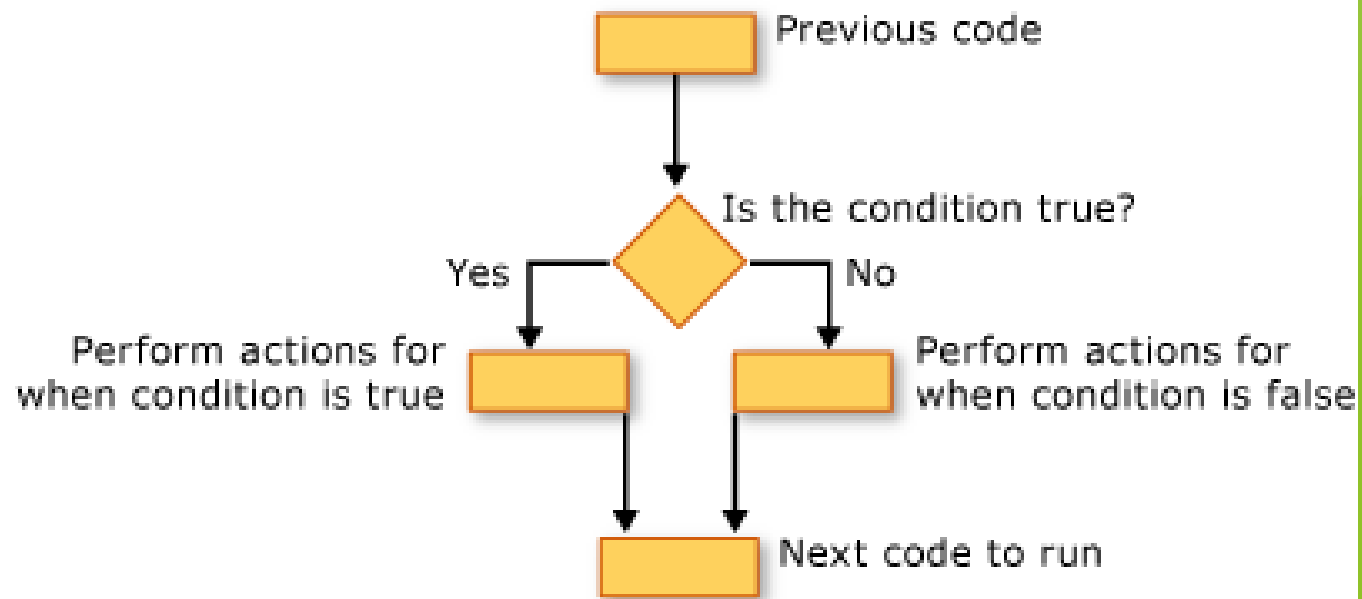


Image from <https://docs.microsoft.com/en-us/dotnet/articles/visual-basic/programming-guide/language-features/control-flow/decision-structures>

▶ 控制结构 Decision Structure (Select Case)

▶ Select Case *test_expression*

▶ Case condition_1

▶ Result_1

▶ Case condition_2

▶ Result_2

▶ ...

▶ Case condition_n

▶ Result_n

▶ Case Else

▶ Result_else

▶ End Select

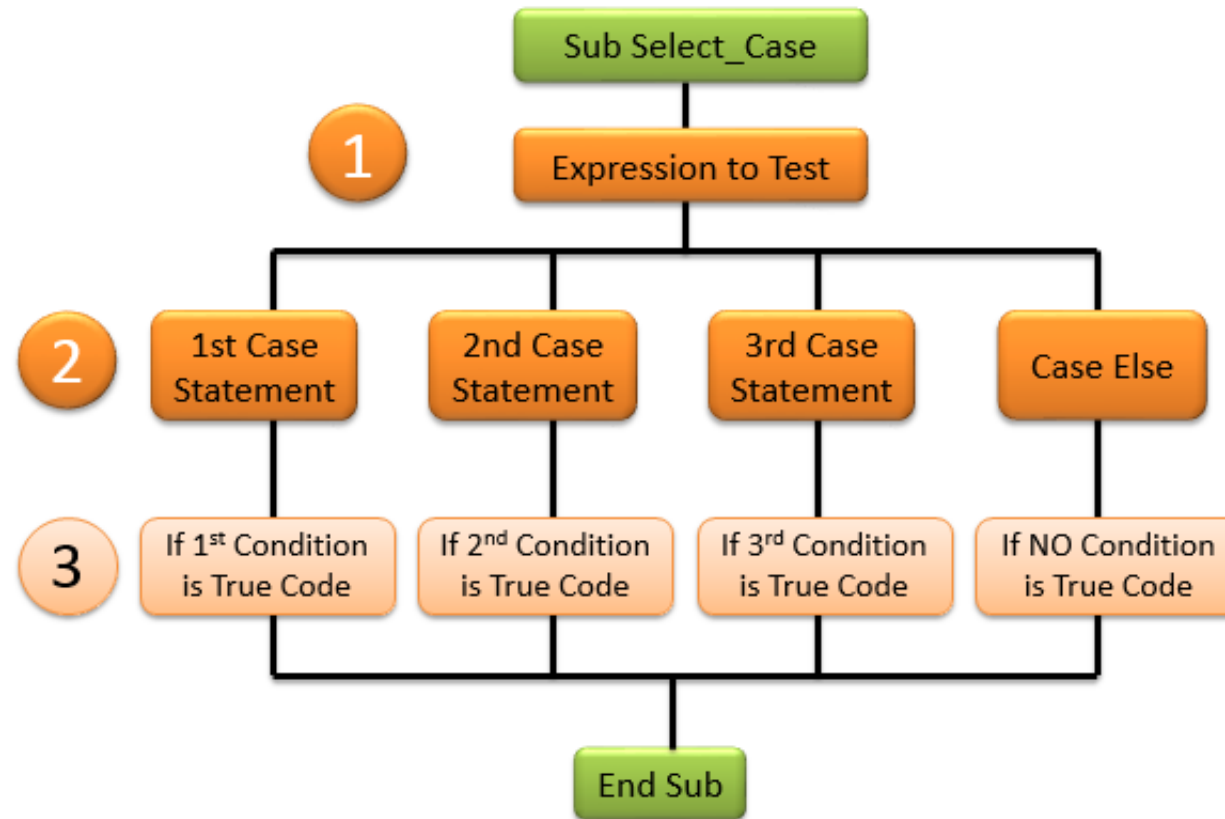


Image from
<http://www.onlinepclearning.com/vba-beginners-vba-case-function-nutshell/>

Continued: Loop Structure

- ▶ 循环结构用于遍历和重复执行代码

Loop Structure for repetitions

- ▶ 比如你可以在代码中遍历以下内容 You can do a loop in

对一个区域中的所有单元格 all cells in a range

对所有打开的工作簿 all open workbooks

对所有工作表 all worksheets in a workbook

对一个单元格中的所有字符 all characters in a cell

对一个文件夹中的所有文件 all files in a folder

- ▶ 循环结构

- ▶ For ... Next ...
- ▶ For Each ... in Next
- ▶ Do ... Loop

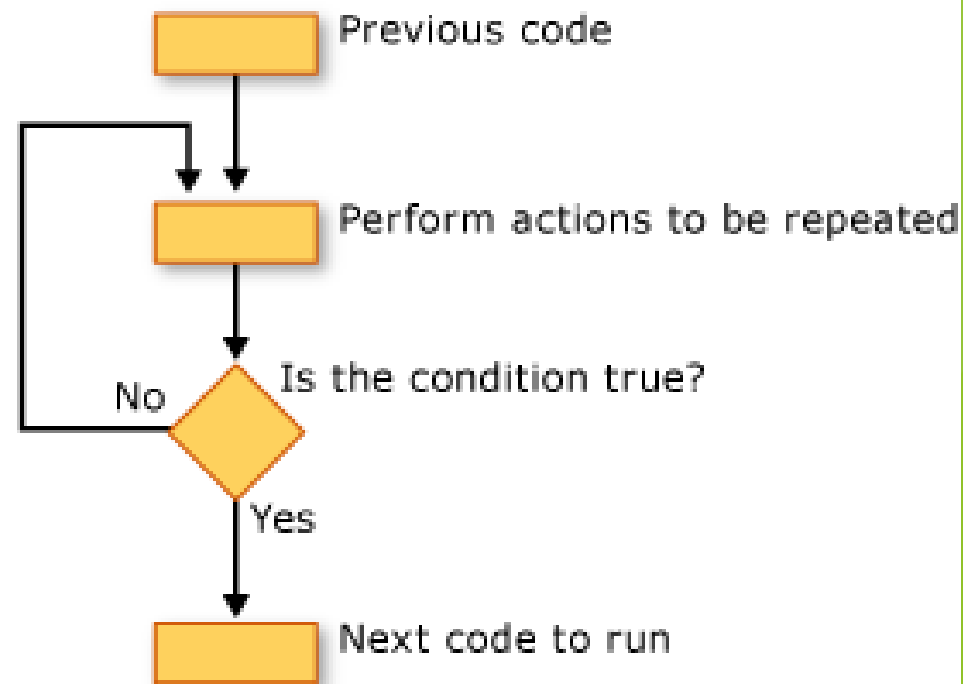


Image from <https://docs.microsoft.com/en-us/dotnet/articles/visual-basic/programming-guide/language-features/control-flow/loop-structures>

Continued: Loop Structure

“For Next” 循环结构

- ▶ For counter [As datatype] = start To end [Step step]
- ▶ [statements]
- ▶ [Continue For]
- ▶ [statements]
- ▶ [Exit For]
- ▶ [statements]
- ▶ Next [counter]

Continued: Loop Structure

Nested “For Next” 嵌套循环结构

- ▶ Sub FillRange ()
- ▶ Dim Col As Integer
- ▶ Dim Row As Long
- ▶ For Col = 1 To 5 ‘ 外部的循环 The outer loop
- ▶ For Row = 1 To 12 ‘ 内部的循环 The inner loop
- ▶ Cells(Row, Col) = Rnd ‘Generate a random number [0,1)
- ▶ Next Row
- ▶ Next Col
- ▶ End Sub

- ▶ See example “fill in range.xls”

Continued: Loop Structure

“For Each ... Next” 循环结构

- ▶ For Each element [As datatype] In group
- ▶ [statements]
- ▶ [Continue For]
- ▶ [statements]
- ▶ [Exit For]
- ▶ [statements]
- ▶ Next [element]

- ▶ See example “get worksheet names.xlsm”

```
'write worksheet names into column A
Sub shtname()
  Dim sht As Worksheet, i As Integer
  i = 1
  For Each sht In Worksheets
    Range("A" & i).Value = sht.Name
    i = i + 1
  Next sht
End Sub
```

Continued: Loop Structure

“Do Loop” 循环结构

- ▶ Do { While | Until } condition
- ▶ [statements]
- ▶ [Continue Do]
- ▶ [statements]
- ▶ [Exit Do]
- ▶ [statements]
- ▶ Loop

- ▶ Do
- ▶ [statements]
- ▶ [Continue Do]
- ▶ [statements]
- ▶ [Exit Do]
- ▶ [statements]
- ▶ Loop { While | Until } condition

Continued: Nested Control Structures

嵌套控制结构

- ▶ 循环之中的循环 Loop inside a loop
- ▶ 循环之中的判断 Decision inside a loop
- ▶ For i= 1 to 10
- ▶ If i mod 2 = 0 then
- ▶ ‘i 是1到10之间的偶数 i is an even number between 1 to 10.
- ▶ End If
- ▶ Next I
- ▶ 判断之中的循环 Loop inside a decision

知识点5: VBA中的数据类型和变量

Basic 5: data type and variables in VBA

- ▶ Variant (the default data type)
- ▶ Boolean
- ▶ Integer/Long
- ▶ Single/Double
- ▶ String
- ▶ Date

```
Sub 按钮1_Click()  
    'About the data type Variant  
    MsgBox TypeName(MyVar)  
    MyVar = "123"  
    MsgBox TypeName(MyVar)  
    MsgBox MyVar + MyVar  
    'MsgBox TypeName(MyVar)  
    MyVar = MyVar / 2  
    'MsgBox TypeName(MyVar)  
    MyVar = "Answer: " & MyVar  
    'MsgBox TypeName(MyVar)  
    MsgBox MyVar  
End Sub
```

职工姓名是文本，保存它时选择 String 型。

人的岁数不可能比 0 小，不可能比 255 大，而且是整数，所以可以选择 Byte 型。

如果是 -32768 到 32767 之间的整数，就选择 Integer 型。

ID号也用String。

职工姓名
裴林

列数通常可用Byte。
Sheet数也可以。

周岁
75

统计局表格的行数最好不要用Integer，而要用Long。

学生人数
3250

Acknowledgement to the image from:
Excel Home 编著. 别怕, Excel VBA其实很简单. 人民邮电出版社. 2012

美国人口
315000000

编辑日期可以用Date。

出生日期
1984年11月13日

计算概率，若用变量表示，可用Single。

圆周率
3.14

如果是很大或很小的整数，就选择 Long 型。

所有的日期都选择 Date 型。

像这种小数可以选择 Single 型。

声明变量

Declare variables

- ▶ Dim a [as Variant]
- ▶ Dim IsLeaf as Boolean
- ▶ Dim columnNum as Integer
- ▶ Dim rowNum as Long
- ▶ Dim Meet_Rate as Single
- ▶ Dim Index_Meet_Rate as Double
- ▶ Dim FileName as String

- ▶ Option Explicit ‘要求强制声明所有变量
Using Option Explicit forces you to declare all your variables.

练习1

Exercise (on your handout)

- ▶ **Recording and modifying a Macro 录制宏并进行修改**
 - ▶ 录制一个宏 Record a Macro; 运行宏 Test a Macro
 - ▶ 查看宏 Examine a Macro; 修改宏 Modify a Macro
 - ▶ 再运行宏 Run a Macro again; 保存宏 Save a Macro
- ▶ 请发挥自己的想象力录制宏，并完成自己的程序 Use your imagination to create a Macro and complete your programme.
- ▶ 推荐录制：新建工作表并创建表头，复制数据，改变格式，打开文件，保存文件等
Recommendation for recording as a macro: create new worksheet and titles, copy data, change format, open and saving files.

练习2

Exercise (on your handout)

- ▶ 请根据学生 (一共500名) 的雅思成绩 以及 申报的专业 来判断他们是否需要读语言班。
Please decide whether the student (500 of them in total) should take a language class, according to their IELTS scores and applied majors.
- ▶ 规则: 不用读语言班的条件 Rule: Criteria for not required taking a language class

	Listen	Speak	Reading	Writing	In Total
Criteria for "Language"	≥ 7	≥ 7	≥ 7	≥ 7	≥ 28 (7 in ave.)
Criteria for "Math"	≥ 5.5	≥ 5.5	≥ 5.5	≥ 5.5	≥ 22 (5.5 in ave.)
Criteria for "Computer_Science"	≥ 6	≥ 6	≥ 6	≥ 6	≥ 24 (6 in ave.)

练习2 答案

```
For i = 2 To r + 1
    '-----FILL CODE IN HERE-----
    'get the scores of each sector in IELTS
    listen = Range("B" & i).Value
    speak = Range("C" & i).Value 'replace "CHANGE_ME" to your answer
    reading = Range("D" & i).Value
    writing = Range("E" & i).Value

    'calculate the average of scores
    ave = (listen + speak + reading + writing) / 4
```

```
If Range("F" & i).Value = "Language" Then
    If listen < 7 Or speak < 7 Or reading < 7 Or writing < 7 Or ave < 7 Then
        'fill some codes below
        Range("G" & i).Value = "Need" 'remove the "" sign
    Else
        'fill some codes
        Range("G" & i).Value = "Do Not Need" 'remove the "" sign
    End If

'if the student applied a Math major.
ElseIf Range("F" & i).Value = "Math" Then
    'fill some codes below
    If listen < 5.5 Or speak < 5.5 Or reading < 5.5 Or writing < 5.5 Or ave < 5.5 Then
        Range("G" & i).Value = "Need"
    Else
        Range("G" & i).Value = "Do Not Need"
    End If

'if the student applied a Computer Science major.
ElseIf Range("F" & i).Value = "Computer Science" Then
    'fill some codes below
    If listen < 6 Or speak < 6 Or reading < 6 Or writing < 6 Or ave < 6 Then
        Range("G" & i).Value = "Need"
    Else
        Range("G" & i).Value = "Do Not Need"
    End If
```

程序调试 Debugging

- ▶ 使用立即窗口和本地窗口 Use immediate window and local window
- ▶ 使用F8来逐行运行 Use F8 to check each line of code
- ▶ 用鼠标或者F9来设置断点 Set check point using your mouse or F9
- ▶ 使用Option Explicit来强制要求声明所有变量 Using Option Explicit to force declaring all variables

Immediate View and Local View

- ▶ (1) VBA -> View -> Immediate Window; (2) VBA -> View -> Local Window

The screenshot displays the VBA IDE interface. The top window shows the code editor for a sub named 'test'. The code is as follows:

```
Sub test()  
    Dim a As Integer  
    Dim b As Single  
    a = 3  
    b = 4.26  
    c = a * b  
End Sub
```

The 'End Sub' line is highlighted in yellow. Below the code editor is the Immediate window, which contains the following text:

```
? 5+3  
8  
? "Hello" + " World!"  
Hello World!
```

To the right of the code editor is the Locals window, which displays the current state of the 'test' sub. The window title is 'VBAProject.Sheet1.test'. It contains a table with the following data:

Expression	Value	Type
Me		Sheet1/Sheet1
a	3	Integer
b	4.26	Single
c	12.78	Variant/Single

知识点5: 字符串的操作与函数

String Manipulation

- ▶ 字符串的连结 We use the & operator to concatenate (join) strings.
- ▶ Dim text1 As String, text2 As String
text1 = "Hi"
text2 = "Tim"
MsgBox text1 & " " & text2
- ▶ 字符串的截取 Extraction of substrings from a string
- ▶ Dim text As String
text = "example text"
MsgBox Left(text, 4) 'To extract the leftmost characters from a string, use Left.
- ▶ MsgBox Right("example text", 2) 'To extract the rightmost characters from a string, use Right. We can also directly insert text in a function.
- ▶ MsgBox Mid("example text", 9, 2) 'To extract a substring, starting in the middle of a string, use Mid.

Continued...

- ▶ 获取字符串的长度 To get the length of a string, use Len.
- ▶ `MsgBox Len("example text")`

- ▶ 找到某字符子串在字符串中的位置
To find the position of a substring in a string, use Instr.
- ▶ `MsgBox Instr("example text", "am")`

- ▶ 字符串的分割 split a text string into an array, by making use of a delimiter character.
- ▶ **Dim WrdArray() As String**
- ▶ `WrdArray() = Split("How are you")`

Adapted from <http://www.excel-easy.com/vba/string-manipulation.html> and http://www.exceltrick.com/formulas_macros/vba-split-function/

应用1: 多工作表的数据汇总

Aggregating data from multiple worksheets

- ▶ 汇总成绩单: 将不同工作表中的数据复制到第一个工作表
Put together the records: To copy all data from multiple worksheets to the first worksheet.

序号	姓名	班级	语文	数学	英语	备注
1	颜克芬	七(1)班	91	93	93	
8	张青键	七(1)班	100	87	91	
10	梁守印	七(1)班	86	93	98	
15	张青凤	七(1)班	91	96	94	
16	陈勇	七(1)班	87	100	87	
49	陈义	七(1)班	100	89	95	
50	陈茜	七(1)班	89	98	84	

Acknowledgement to the case adapted from: Excel Home 编著. 别怕, Excel VBA 其实很简单. 人民邮电出版社. 2012

应用2:多工作簿的数据汇总

Aggregating data from multiple workbooks

- ▶ 不同班级成绩表的数据汇总 Put all students' data together from different class

序号	姓名	性别	族别	出生年月	家庭住址	班级	备注
1	陈发新	男	汉族	19980726	细岩村翁奇组	七1	
2	李文雄	男	汉族	19981003	老院村茶园组	七1	
3	李涛	男	汉族	19990912	左八村四组	七1	

- ▶ 一共有约30个不同的工作簿 There are around 30 worksheets
- ▶ See folder “data aggregation from workbooks”

Adapted from 《别怕，其实VBA很简单》
4.7.10 汇总同文件夹下多工作簿数据

Acknowledgement to the case
adapted from: Excel Home 编著.
别怕，Excel VBA 其实很简单. 人
民邮电出版社. 2012

其它数据获取和处理的应用?

Other apps about data acquisition and processing?

- ▶ 从文本文档中获取数据

Getting data from .txt files

- ▶ 从网页和html文档中获取数据

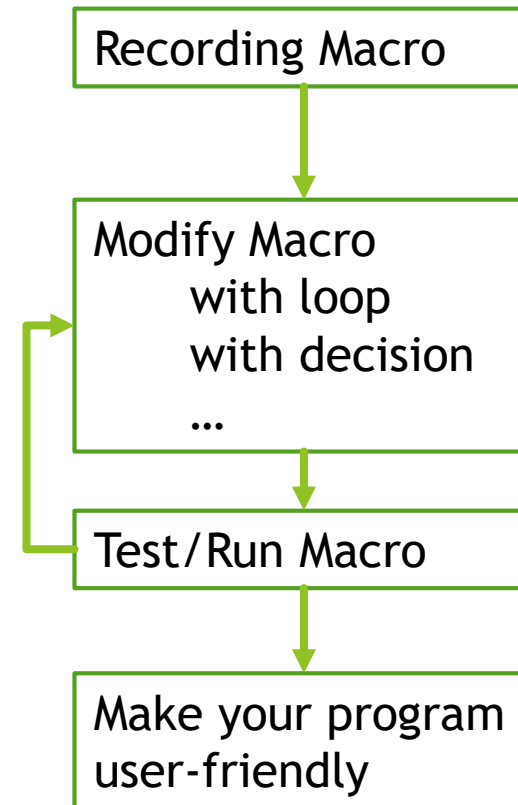
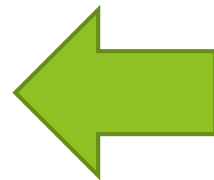
Getting data from webpage or html

- ▶ 从Access数据库中获取数据

Getting data from Access

- ▶ 对数据进行格式化的处理

Formatting data to your own needs



今天没有涉及到但重要的知识

Important knowledge not discussed today

- ▶ 窗体 Form
- ▶ 图表对象 The Object “Chart”
- ▶ 自定义函数 Write your own Functions
- ▶ 自定义Ribbon选项卡 Write your own Ribbons (XML)

- ▶ VSTO (Visual Basics, C#, .Net Framework)
- ▶ Apps for Office 2013 and upwards (XML)
- ▶ Roadmap for Apps for Office, VSTO, and VBA
<https://blogs.msdn.microsoft.com/officeapps/2013/06/18/roadmap-for-apps-for-office-vsto-and-vba/>

资源推荐 Resources

网站 websites

- ▶ Excel VBA documentation for Excel 2013 and above
<https://msdn.microsoft.com/en-us/VBA/VBA-Excel> [in English]
- ▶ Excel Home 论坛中的VBA板块 <http://club.excelhome.net/forum-2-1.html>
- ▶ Excel Home. Excel VBA 视频教程 <http://www.excelhome.net/video/excel/vba/>
- ▶ 善用百度、Bing、Google... Make good use of search engines.
- ▶ Excel Easy. <http://www.excel-easy.com/vba.html> [in English]
- ▶ VBA Q & A on Stack Overflow <http://stackoverflow.com/questions/tagged/vba> [in English]

图书 Books

- ▶ Walkenbach, J. (2015). Excel VBA programming for dummies. Hoboken, NJ: For Dummies, A Wiley Brand.
<http://10.7.1.204:81/info.php?resid=99493065> (For XJTLU Lib users only)
- ▶ Excel Home编著. 别怕, Excel VBA其实很简单. 人民邮电出版社. 2012
- ▶ Excel Home编著. 别怕, Excel VBA其实很简单 (第二版). 北京大学出版社. 2016

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John Walkenbach.
John Wiley & Sons, c2013.
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Dian zi gong ye chu ban she, 2014.
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Dian zi gong ye chu ban she, 2011.
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Luo Gangjun zhu.

Dian zi gong ye chu ban she, 2014.

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Thank you for your attention!

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