Data MATRIX

Using VBScript For Perfecting Statistical Report

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Outline

- How we have come to **VBScript**
- Examples of using VBScript for **.RTF** documents
- How to write and launch VBScripts in **SAS**
- Other cases when **VBS&SAS** work
- How to get Visual Basic functions and procedures, if you are new to VBS (*SPOILER*: it's not Google)

Motivation

SAS Programmer`s responsibility is **generating SARs**

Automation of the report development process

Call of **external programs**

Our choice for .**RTF** documents is …

Let’s look at VBS

- It’s a variant of MS Visual Basic language
- VBS is recognizable for MS Office® applications
- VBS code can be obtained from MS Word
- VBS can perform commands in MS Office® that can’t be executed in SAS

Let the replacement begin!

abolism·and·nutrition·disorders¤ Type·2·diabetes·mellitus¤ Type·2·diabetes·mellitus¤ 1996¤ ONGOING¤ ¤
cular·disorders¤ Essential·hypertension¤ Essential·hypertension¤ 2004¤ ONGOING¤ ¤

¤
□

¶ Section Break (Continuous)

Sponsor's·Name¶
PROJECT·CODE¶
Listing:5, ·Relevant·Medical·History¶
Page··3·of·75·····¶

tem·Organ·Class¤	Medical·History↵ Dictionary-Derived·Term¤	Medical·History↵ Verbatim·Term¤	Start·date¤	End·Date¤	
diac·disorders¤	Angina·pectoris¤	Ischemic·heart·disease, ·angina·pectoris¤	-¤	ONGOING¤	¤
	Aortic·valve·stenosis¤	Aortic·valve·stenosis¤	-¤	ONGOING¤	¤

I am ^m - page break

I ~~am~~ was ^b - section break

Metabolism·and·nutrition·disorders¤	Type·2·diabetes·mellitus¤	Type·2·diabetes·mellitus¤	1996¤	ONGOI
Vascular·disorders¤	Essential·hypertension¤	Essential·hypertension¤	2004¤	ONGOI

¶
Page Break

Sponsor's·Name¶
PROJECT·CODE¶
Listing:5, ·Relevant·Medical·History·(MedDRA·18.0)¶
Page··3·of·75·····¶

System·Organ·Class¤	Medical·History↵ Dictionary-Derived·Term¤	Medical·History↵ Verbatim·Term¤	Start·date¤	End·D
Cardiac·disorders¤	Angina·pectoris¤	Ischemic·heart·disease, ·angina·pectoris¤	-¤	ONGOI
¤	Aortic·valve·stenosis¤	Aortic·valve·stenosis¤	-¤	ONGOI

It’s time to start scripting

The external script file is created in the specified directory:

```
data _null_;
   file "C:\VBS_SAS\replace.vbs";
   put "…";

run;
```

… and has …

.VBS extension

Filling the script

Use `put` operator to write VBS commands:

- Word.Application object is created

```
put "Dim wrdApp: Set wrdApp =
WScript.CreateObject(""Word.Application"")";
```

- The document to be transformed is opened

```
put "Dim wrdDoc";
put "Set wrdDoc =
wrdApp.Documents.Open(""&pth\&filename..&format"")";
```

The power of special symbols

Find all section break occurrences and replace them with page breaks

```
put "wdReplaceAll = 2";
put "wrdDoc.Select";
put "With wrdApp.Selection.Find";
put "    .ClearFormatting";
put "    .Replacement.ClearFormatting";
put "    .Text = """^b""";
put "    .Replacement.Text = """^m""";
put "    .Forward = True";
put "    .Wrap = wdFindContinue";
put "    .Format = False";
put "    .MatchCase = False";
put "    .MatchWholeWord = False";
put "    .Execute , , , , , , , , , , wdReplaceAll";
put "End With";
```

```
.Text = ""^b""
```

```
.Replacement.Text = ""^m""
```

Other replacements

```
put "     .Text = ""^b""";
put "     .Replacement.Text = "" """;
```

^b

section break

“ ”

blank line

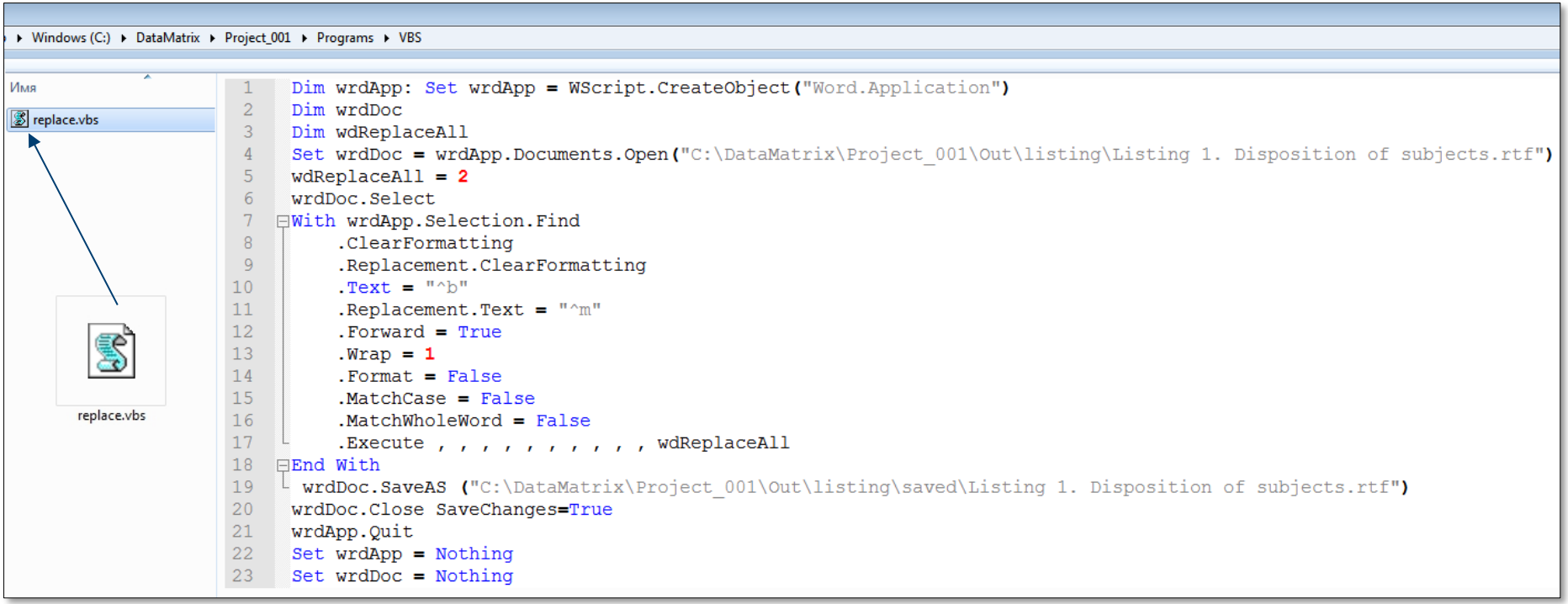
^p	Paragraph Mark	^c	Clipboard Contents	^g	Graphic
^t	Tab Character	^n	Column Break	^l	Manual Line Break
^?	Any Character	^+	Em Dash	^m	Manual Page Break
^#	Any Digit	^=	En Dash	^~	Nonbreaking Hyphen
^$	Any Letter	^e	Endnote Mark	^s	Nonbreaking Space
^^	Caret Character	^d	Field	^-	Optional Hyphen
^u	Section Character	^&	Find What Text	^b	Section Break
^v	Paragraph Character	^f	Footnote Mark	^w	White Space

Save and close word document and script

- Save the document - **wrdDoc.SaveAS**
- Close the document - **wrdDoc.Close**
- Close the application - **wrdApp.Quit**

```
put "wrdDoc.SaveAS (""&infile."")";
put "wrdDoc.Close SaveChanges=True";
put "wrdApp.Quit";
put "Set wrdApp = Nothing";
put "Set wrdDoc = Nothing";
```

How the result looks like




```
Dim wrdApp: Set wrdApp = WScript.CreateObject("Word.Application")
Dim wrdDoc
Dim wdReplaceAll
Set wrdDoc = wrdApp.Documents.Open("C:\DataMatrix\Project_001\Out\listing\Listing 1. Disposition of subjects.rtf")
wdReplaceAll = 2
wrdDoc.Select
With wrdApp.Selection.Find
    .ClearFormatting
    .Replacement.ClearFormatting
    .Text = "^b"
    .Replacement.Text = "^m"
    .Forward = True
    .Wrap = 1
    .Format = False
    .MatchCase = False
    .MatchWholeWord = False
    .Execute , , , , , , , , , , wdReplaceAll
End With
 wrdDoc.SaveAS ("C:\DataMatrix\Project_001\Out\listing\saved\Listing 1. Disposition of subjects.rtf")
wrdDoc.Close SaveChanges=True
wrdApp.Quit
Set wrdApp = Nothing
Set wrdDoc = Nothing
```

Who runs the script? *SAS!*

There are several ways to run the script from SAS:

- Manually from folder: "C:\VBS_SAS\replace.vbs"

- ```
  data _null_;
    call system("&path\&scriptname.vbs");
  run;
  ```

- ```
  X "&path\&scriptname.vbs";
  ```

Other tasks within the VBScript capabilities

Merging many .RTF files into one

Obvious VBS/ If…Then… SAS

```
Const wdPageBreak = 7

Set objWord = CreateObject("Word.Application")
objWord.Visible = TRUE
Set objDoc = objWord.Documents.Add
Set objSelection = objWord.Selection

objDoc.Bookmarks("\EndOfDoc").Range.InsertFile
"C:\VBS_SAS\TFLs\table01.rtf"
objDoc.Characters.Last.Select
objSelection.InsertBreak(wdPageBreak)

objDoc.Bookmarks("\EndOfDoc").Range.InsertFile
"C:\VBS_SAS\TFLs\table02.rtf"
objDoc.Characters.Last.Select
objSelection.InsertBreak(wdPageBreak)

objDoc.Bookmarks("\EndOfDoc").Range.InsertFile
"C:\VBS_SAS\TFLs\table03.rtf"
...
```

Obvious SAS/ If…Then… VBS

```
Const wrdPageBreak = 7

On Error Resume Next
Set fso = CreateObject("Scripting.FileSystemObject")
Set folder = fso.GetFolder("C:\VBS_SAS\TFLs\")
Set Files = folder.Files

Set objWord = CreateObject("Word.Application")
objWord.Visible = true

Set objDoc = objWord.Documents.Add
Set objSelection = objWord.Selection
For Each fil In Files
  If (Right(LCase(fil), 4) = ".rtf" And
    InStr(fil, "~$") = 0) then
    objDoc.Bookmarks("\EndOfDoc").Range.InsertFile
    fil.Path objDoc.Characters.Last.Select
    objSelection.InsertBreak(wdPageBreak)
  End If
Next
```

Other tasks within the VBScript capabilities

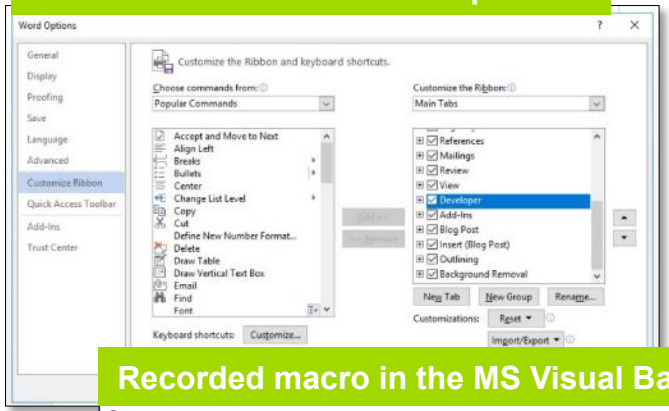
- Automate SAS tasks, traverse the file system, send emails programmatically, manipulate Microsoft Excel, PowerPoint and other files, get web data.
- Develop SAS macros for PDF-manipulation, control and automation
- Perform automated and controlled analysis using JMP on the Windows platform

and more …

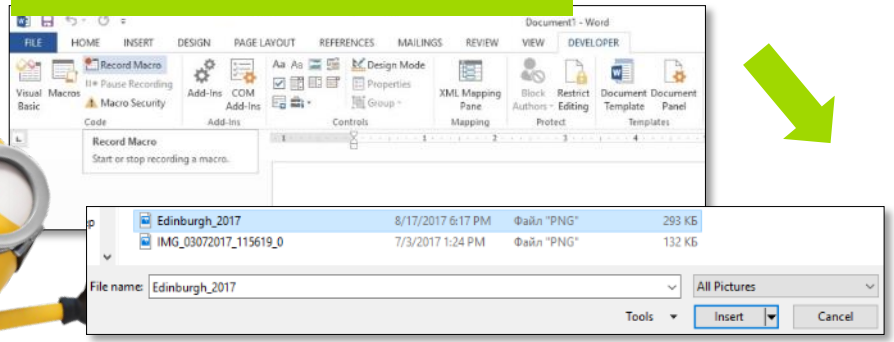
An easy way to start writing a simple VBScripts

Using the developer tab

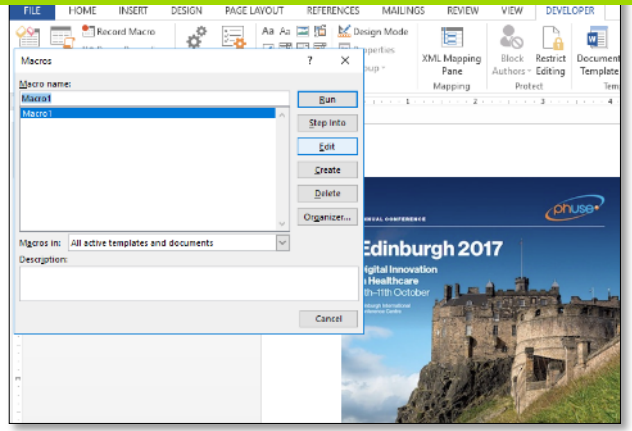
MS Word customize ribbon options



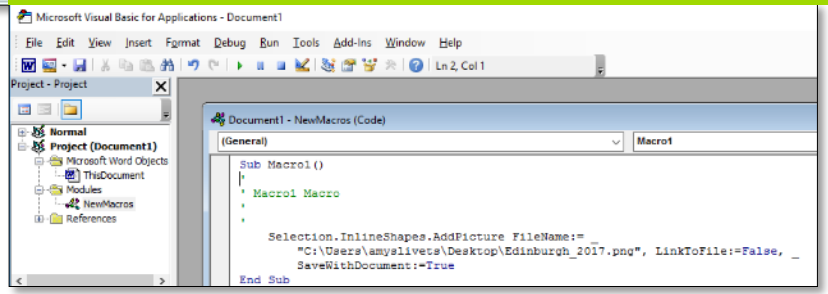
MS Word “Record macro” button



Inserting the picture into the document



Recorded macro in the MS Visual Basic for application



Conclusion

VBS helps to automate the process of creating statistical reports

- Deals with MS Office documents
- Can be written and launched within SAS
- Allows to perform commands in MS Office that cannot be directly executed in SAS
- Necessary code can be obtained directly from Word

Thank you for your attention!

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