

Single Day Event

The Right Tool - Benefits of being multi-lingual
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FOREWORD (is fore-armed)

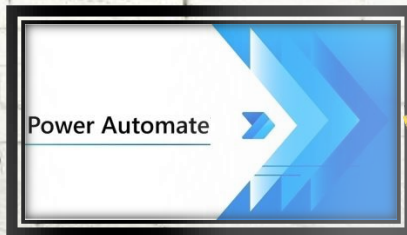
I do not directly or indirectly endorse any of the products, software, programming languages, tools, or methods mentioned in this presentation.

The use of brand names and/or any mention or listing of specific commercial products or services herein is solely for educational purposes.

All examples covered are from my own personal experience *(although parts required the greater experience of the internet)*.



Contents





Objectives from this presentation

-  *You'll learn a load of languages*
-  *You'll have the code to replicate what I've done*
-  *You'll see real life examples of what can be done*
-  *You'll be inspired to consider new ways of working and different approaches to tasks*
-  *You'll see the benefits of learning new programming languages*



Groovy (inside SAS)

Background:

Note: For examples, ODS ESCAPECHAR = ^

Using SAS to output Listing with text in Calibri (proportional font).

Need to wrap and indent text using **^n** and **^m**.

Data:

OUTPUT	
1	AESOC/^n ^mAEDECOBtInMixedCase;GoodExample;iiiiiiiiiii;GoodExample;oooooooooooo;Fin

Code

```
proc report data=outdata;  
  column output;  
  define output / display style(column)=[asis=on];  
run;
```

Output

OUTPUT
AESOC/ AEDECOBtInMixedCase;G oodExample;iiiiiiiiiii;GoodExa mple;oooooooooooo;Fin

*This is pretty
bad to read...*

Decided to manually add line breaks between words but..

length() won't help as each character has different width.



Groovy (inside SAS)

Solution:



has packages to return the actual printed width of a string in a specified font, style and font size:

```
font = new Font("Calibri", Font.PLAIN, 10)
metrics = c.getFontMetrics(font)
metrics.stringWidth(messageText)
```

Wrapped **proc groovy** code in a macro.

Combined that with **proc fcmp** to create a new function `printwidth()` that returns the printed width of a string.



Groovy (inside SAS)

Final Product:

```
... do i=1 to (countc(aedecods,',')+1); < Loop through "word"s
    str=scan(aedecods,i,',' );
    strw=printwidth(strip(str)); < Our new function in action:
    len=len+strw;                  using Groovy for printed width
    if len>110 then do;
        output=catx(';^n ',output,str); < Add new line characters
        len=strw;
    end;
    else output=catx(',' ,output,str);
end;
```

Updated Data:

OUTPUT	
1	AESOC/^n ^mAEDECODButInMixedCase;^n GoodExample;iiiiiiiiiii;^n GoodExample;^n ooooooooooooo;Fin

Output (Old)

OUTPUT
AESOC/ AEDECODButInMixedCase;G oodExample;iiiiiiiiiii;GoodExa mple;oooooooooooo;Fin

Output (New)

OUTPUT
AESOC/ AEDECODButInMixedCase; GoodExample;iiiiiiiiiii; GoodExample; oooooooooooo;Fin

11 x "i"
11 x "o"
The code has wrapped
them sensibly based
on printed length



GREP (Linux Terminal)

Background:

Working in a Linux environment.

We want to derive ADaM dependencies (see which ADaMs were used to derive other ADaMs) for populating an ADRG.

Program Logs are available and contain the text “NOTE: There were <n> observations read from the data set ADAM.<DATASET>.”



GREP (Linux Terminal)

Solution:

Within the Linux terminal the following lines can be used to search through all log files

```
grep "observations read from the data set ADAM\." <loglocation>/ad*.log";
```

Aside from use in Linux terminal, if XCMD is enabled in SAS then FILENAME with PIPE engine can be used to read output from GREP.

R also has a `grep()` function which can be combined with `list.files()` and `readLines()` to give a similar output.



GREP (Linux Terminal)

Final Product:

```
adae.log:NOTE: There were 1339 observations read from the data set ADAMDATA.ADSL.  
adds.log:NOTE: There were 1339 observations read from the data set ADAMDATA.ADSL.  
adeg.log:NOTE: There were 1339 observations read from the data set ADAMDATA.ADSL.  
adex.log:NOTE: There were 1339 observations read from the data set ADAMDATA.ADSL.  
adeff.log:NOTE: There were 562 observations read from the data set ADAMDATA.ADEX.  
adeff.log:NOTE: There were 1339 observations read from the data set ADAMDATA.ADSL.  
adlb.log:NOTE: There were 1339 observations read from the data set ADAMDATA.ADSL.  
adlb.log:NOTE: There were 1339 observations read from the data set ADAMDATA.ADCM.  
advs.log:NOTE: There were 1339 observations read from the data set ADAMDATA.ADSL.
```

This output tells us that all ADaMs use ADSL

ADEFF also uses ADEX

ADLB also uses ADCM



.NET

Background:

PC SAS had SAS/AF to add advanced tools/utilities to SAS.

SAS Enterprise Guide instead use Tasks to add such functionality.

Custom Tasks can be programmed in .NET languages for example C# or VB, outputting a Class Library (.dll) that can be integrated into SAS EG.

These Tasks can benefit from SAS in-built functionality.



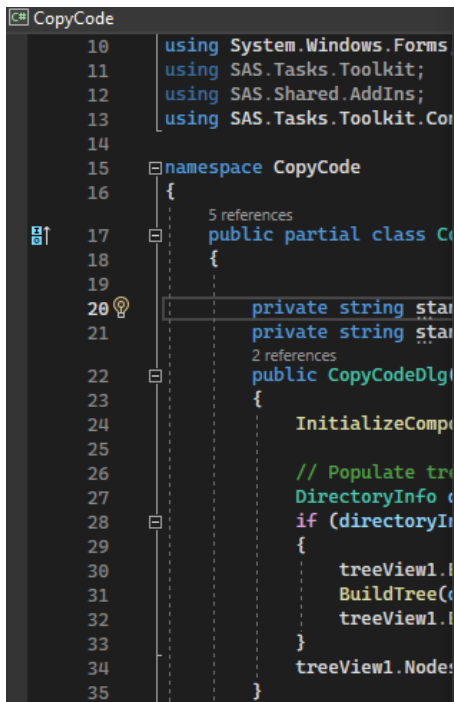
.NET

Solution:

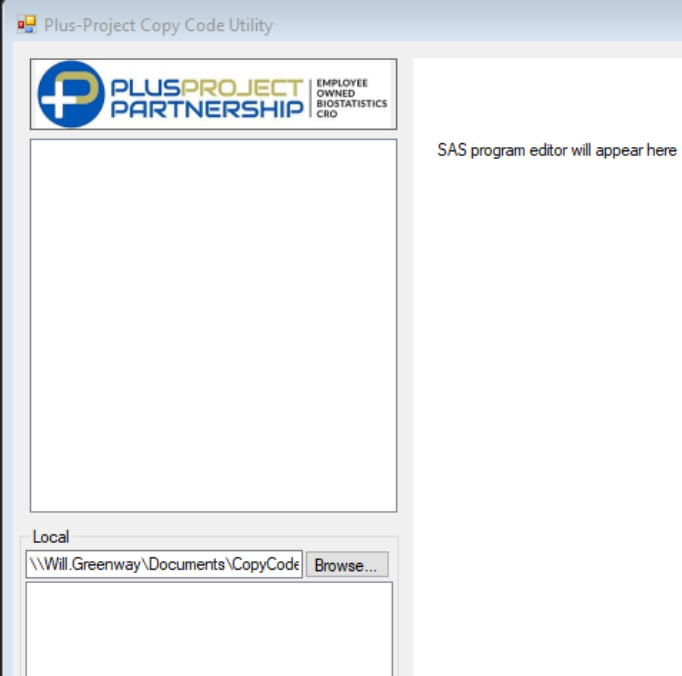
☁ Load SAS's .dll into your .NET IDE and reference them

🔧 Utilise these to build SAS-friendly apps

☁ Copy the final .dll into a “custom” folder in SAS EG's install to integrate



```
10 using System.Windows.Forms;
11 using SAS.Tasks.Toolkit;
12 using SAS.Shared.AddIns;
13 using SAS.Tasks.Toolkit.Com
14
15 namespace CopyCode
16 {
17     5 references
18     public partial class Co
19     {
20         private string stan
21         private string stan
22         2 references
23         public CopyCodeDlg
24         {
25             InitializeComp
26
27             // Populate tre
28             DirectoryInfo c
29             if (directoryIn
30             {
31                 treeView1.L
32                 BuildTree(c
33                 treeView1.L
34             }
35             treeView1.Node:
```





.NET

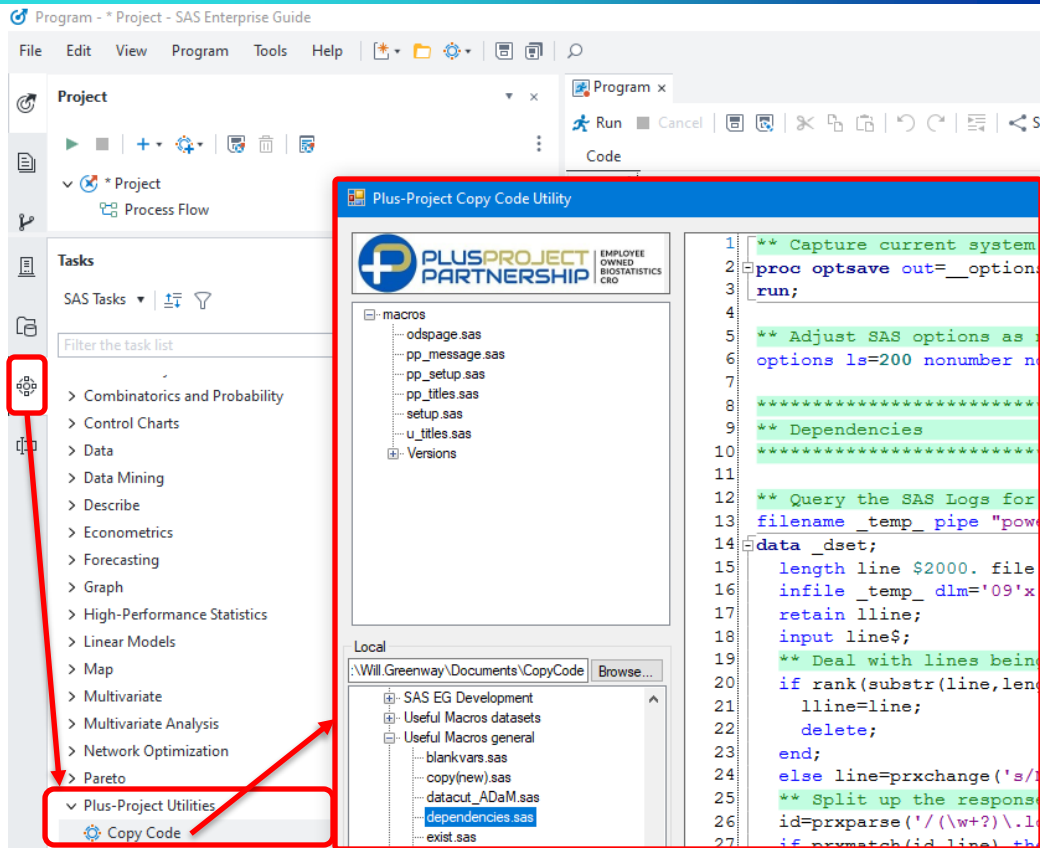
Final Product:

The interactive App opened from within SAS.

Includes SAS Features, e.g. program editor window with native SAS syntax highlighting.

Can interact with data.

Options are almost limitless.





JavaScript (in Adobe)

Background:

Using a legacy system that didn't have a PDF compiler utility.

Outputs generated in PDF and each have their own single bookmark. These individual PDFs need combining.

Adobe Acrobat is used to combine but additional levels of bookmarks are auto-generated:

Do not want! →



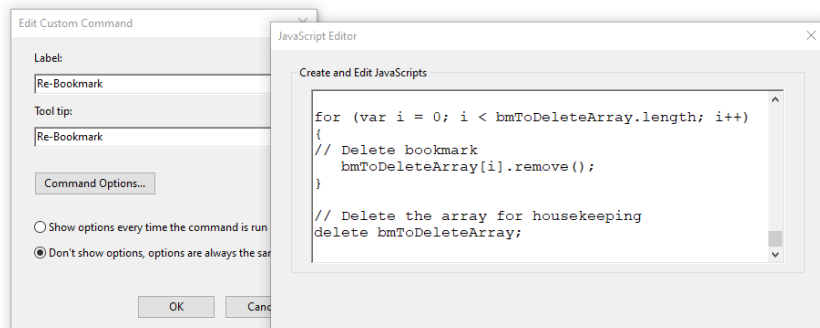


JavaScript (in Adobe)

Solution:

Adobe Acrobat, like many other software, has the ability for users to add custom Tools or scripts.

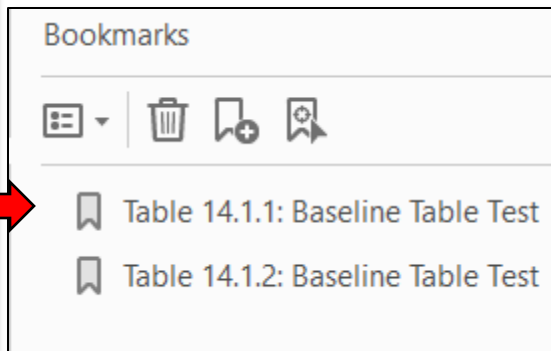
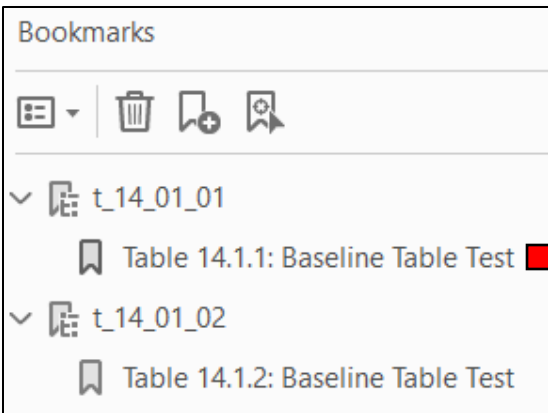
These can be added in a few ways. We added a Custom Command which contained JavaScript to “fix” the bookmarks.





JavaScript (in Adobe)

Final Product:



Also added to a “Tool”
which flows with related
actions:

Compile PDF

Combine Files into a Sin...

Re-Bookmark

Reduce File Size



Python

Background:

There are many ways to combine PDF files in various ways, including GROOVY (which already mentioned can run in SAS).

But sometimes a simple Graphical User Interface (GUI) can help users.

We wanted to build a PDF combining process with a GUI that utilises things we already have, is faster, and without the bookmarking issue we noted in the last example.



Python

Solution:

Wrote a small app in Python.

Used the following packages:

- TKINTER and TKKBOOTSTRAP package for the GUI.
- PANDAS for interacting with SAS datasets so we could use the TITLES metadata file we already create.
- PYPDF for combining the PDF files.
- And a few others for a splash of functionality



Python

Final Product:

Simple app (still in PoC phase) with a GUI.

Step 1: Browse to the location of the PDF file(s)

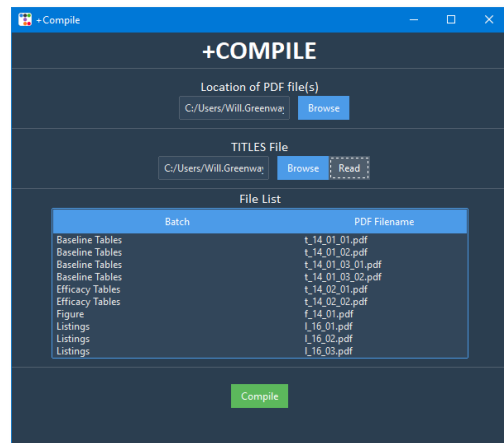
Step 2: Browse to a TITLES file

Step 3: Click “Read” to populate the File List

Step 4: Remove files or adjust order if needed

Step 5: Click Compile

DONE! Far faster than using Adobe Acrobat,
more automated and no bookmark issue!



*This alone contains 10k
pages, took < 30
seconds for all 4 files*

- CDISC-Sample_Listings_2024-08-20.pdf
- CDISC-Sample_Baseline Tables_2024-08-20.pdf
- CDISC-Sample_Efficacy Tables_2024-08-20.pdf
- CDISC-Sample_Figure_2024-08-20.pdf



VBA (inside MS Word)

Background:

TFL mock shells are created in MS Word.

To enable efficient ADaM planning and TFL programming, shells are annotated with ADaM source variables or notes.

When used internally by programmers, annotations are useful, but if sending for shell review they are not required.

Don't want to create two versions that may get out of sync.

It can take a long time to remove annotations prior to sending.



VBA (inside MS Word)

Solution:

VBA macro in MS Word:

- Temporarily disables screen updating.
- Loop through all shapes (annotations) and hides or unhides as needed.

Annotations can be hidden during a shell review.

Reviewer can make updates in situ and return the file, annotations will largely be intact.



VBA (inside MS Word)

Final Product:

ADSL (Subject-Level Analysis Dataset)			
CDISC-Sample			
Table 14.1.2.1: Summary of Demographics			
Analysis Set: Randomised Population Where RANDFL = "Y"			
Page 1 of X			
Parameter Statistic	Active Drug (N=XXX)	Placebo (N=XXX)	Overall (N=XXX)
Age [years]			
n	XX	XX	XX
Mean (SD)	XX.X (XX.XX)	XX.X (XX.XX)	XX.X (XX.XX)
Median	XX.X	XX.X	XX.X
Min - Max	XX - XX	XX - XX	XX - XX
Age group [n (%)]			
< 15 years	XX (XX.X)	XX (XX.X)	XX (XX.X)
15 years to 17 years	XX (XX.X)	XX (XX.X)	XX (XX.X)
≥ 18 years	XX (XX.X)	XX (XX.X)	XX (XX.X)
Age group [n (%)]			
< 18 years	XX (XX.X)	XX (XX.X)	XX (XX.X)
≥ 18 years	XX (XX.X)	XX (XX.X)	XX (XX.X)
Height [cm]			
n	XX	XX	XX
Mean (SD)	XX.X (XX.XX)	XX.X (XX.XX)	XX.X (XX.XX)
Median	XX.X	XX.X	XX.X
Min - Max	XX - XX	XX - XX	XX - XX
Weight [kg]			
n	XX	XX	XX
Mean (SD)	XX.X (XX.XX)	XX.X (XX.XX)	XX.X (XX.XX)
Median	XX.X	XX.X	XX.X
Min - Max	XX - XX	XX - XX	XX - XX



Power Automate

Background:

It doesn't have to be ALL about learning other languages.

Some process flows can be setup using a GUI front-end.

Consider “Out of Office” notifications:

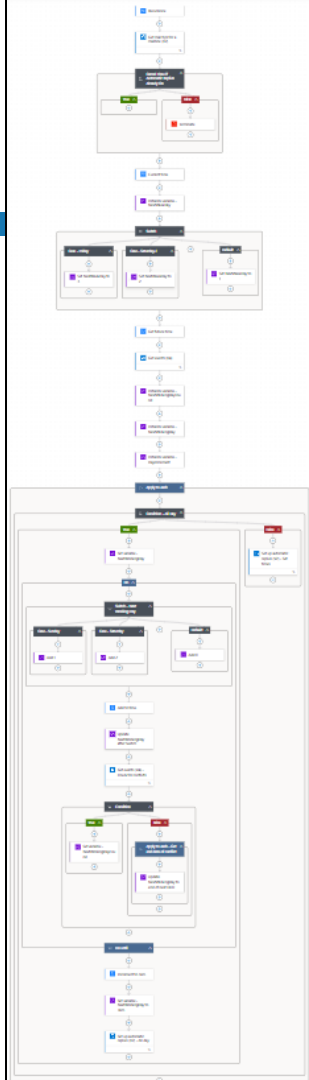
- You've setup an out-of-office meeting (perhaps recurring) in your Outlook calendar.
- Why should you then need to remember to turn your OoO notifications on.



Power Automate

Solution: Microsoft Power Automate (PA)!

- Connect PA to your Calendar and run below daily:
- OoO message enabled? If so exit, else continue:
- OoO events tomorrow? If not exit, else continue:
- All day? If so:
 - Jump to end of OoO and find next working day (Consider further OoO, weekends & bank holidays).
- Enable automatic replies during the leave.
 - Include a standard message that includes dynamic fields for start of leave and return date (and times if not all day).





Power Automate

Final Product:

Automatic replies
enabled without
manual set up.

Starts 6pm prior
working day until
8am return day.

Message body
included dates.

A screenshot of the Microsoft 365 Out of Office settings interface. At the top, there is a toggle switch labeled "Automatic replies on" which is turned on. Below this, a checkbox labeled "Send replies only during a time period" is checked. Underneath, there are two rows for setting time periods. The first row is for the "Start time", set to "2024-09-20" at "18:00". The second row is for the "End time", set to "2024-09-24" at "08:00". Below these, there are three unchecked checkboxes: "Block my calendar for this period", "Automatically decline new invitations for events that occur during this period", and "Decline and cancel my meetings during this period". At the bottom, there is a section titled "Send automatic replies inside your organisation" which contains a rich text editor. The text in the editor reads: "Hi, I will be out of the office from Monday 23Sep2024 returning Tuesday 24Sep2024. During this time I will have no access to my emails which may result in a delay to responses. I will reply to all messages as soon as I am able."

Automatic replies on

☒ Send replies only during a time period

Start time 2024-09-20 18:00

End time 2024-09-24 08:00

☐ Block my calendar for this period

☐ Automatically decline new invitations for events that occur during this period

☐ Decline and cancel my meetings during this period ⓘ

Send automatic replies inside your organisation

Hi,

I will be out of the office from Monday 23Sep2024 returning Tuesday 24Sep2024.

During this time I will have no access to my emails which may result in a delay to responses. I will reply to all messages as soon as I am able.



Others

1	HAI
2	CAN HAS STDIO?
3	VISIBLE "Hello World!"
4	KTHXBYE

THIS IS NOT THE LIMIT!!!

GREP equivalent in Windows PowerShell: `Select-String`

GROOVY can also be run in R (rGroovy package)

Coding environments often have ways to enhance, e.g. SlickEdit has Slick-C language, IntelliJCE has Groovy Scripts

There are many weird and wonderful languages out there, each with their own pros and cons



Summary

Half the battle is knowing that something is possible / there are options.

Don't be afraid to try something new, and don't just stick with what you know. Branch out!

Don't limit yourselves to one language.

The PHUSE Archive, Google, ChatGPT etc. are your friends but don't just copy-paste. Read/understand code before using...

System32 should NOT be deleted! ↩

question
/ˈkwɛstʃ(ə)n/

noun

1. a sentence worded or expressed so as to elicit information.
"we hope this leaflet has been helpful in answering your questions"

Similar: inquiry query interrogation examination quiz quizzing

answer
/ˈɑːnsə/

verb

ask (someone) a question
"four men were asked to answer the question"

noun

1. a thing that is said, written, or done as a reaction to a question, statement, or situation.
"he knocked and entered without waiting for an answer"
2. a solution to a problem or dilemma.
"the answer to poverty and unemployment is a properly funded range of services"
3. a verbal or written response from Will
"there was laughter at his answer to the question"

Similar: reply response rejoinder return reaction acknowledgement



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