

Single Day Event

Why be multilingual in the SAS environment?
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Overview

- Why would you want to utilize another programming language ?
- How do you utilize other languages?
- Worked examples of using various languages



Why not use SAS ?



**Language
Simplicity!**



**High
Performance!**



**Code with
long life!**



**Regulators
love it!**



Why not use SAS ?

- Sas is unable to perform a task
- Another Language is better at performing a task



Why not use SAS ?

SQL



Why not use SAS ?

Sample I

ID	Info
1	3123
1	1234
2	7482
2	8912
3	1284

Sample II

ID	Info2
1	4444
1	5555
1	8989
2	9099
2	8888
3	8989



Why not use SAS ?

```
data combined;  
merge dat1 dat2 ;  
by ID;  
run;
```

ID	Info	Info2
1	3123	4444
1	1234	5555
1	1234	8989
2	7482	9099
2	8912	8888
3	1284	8989

```
proc sql noprint;  
create table combined2 as  
select * from dat1 a  
join dat2 b  
on a.ID = b.ID;  
quit;
```

Many to Many		
ID	Info	Info2
1	3123	4444
1	1234	4444
1	3123	5555
1	1234	5555
1	3123	8989
1	1234	8989
2	7482	9099
2	8912	9099
2	7482	8888
2	8912	8888
3	1284	8989





Command lines/Linux

- What is Command line/Linux?

A screenshot of a Windows Command Prompt window. The title bar shows "Command Prompt" with standard window controls. The text inside the window is as follows:

```
Microsoft Windows [Version 10.0.22621.4037]
(c) Microsoft Corporation. All rights reserved.

C:\Users\JLetton1>doskey hello=echo Hello world!

C:\Users\JLetton1>hello
Hello world!

C:\Users\JLetton1>
```




Command line/Linux

- Why use Command line/Linux?



Command line/Linux

- How to call in Command line/Linux?

Call system (“command”) ;



Command line Copy?

Call system (“**cp** <program path 1/program name> <program path 2>”);

```
%let path1=/OriginalPath/adae.sas;  
%let path2=/TargetPath;  
.....  
data _null_;  
    call system("cp &path1. &path2.");  
run;
```



Command line Copy?

Call system (“**cp** <program path 1/program name> <program path 2/new name>”)
;

```
%let path1=/OriginalPath/adae.sas;  
%let path2=/TargetPath/adae_final.sas;
```

```
data _null_;  
  call system("cp &path1. &path2.");  
run;
```



Command line Copy?

```
data pgmcpds;  
  set programs;  
  
  pgmname = lowercase(pgmname);  
  orgfile = cats("&orgdir1.", "/", pgmname);  
  cmdline = cat("cp ", trim(left(orgfile)), " &trgdir1.");  
  
  call system(cmdline);  
run;
```



Command line Copy?

Total rows: 20 Total columns: 3

	PGMNAME	ORGFILE	CMDLINE
1	adae.sas	OringalDirectory/adae.sas	cp OringalDirectory/adae.sas TargetDictory
2	adbbc.sas	OringalDirectory/adbbc.sas	cp OringalDirectory/adbbc.sas TargetDictory
3	adcm.sas	OringalDirectory/adcm.sas	cp OringalDirectory/adcm.sas TargetDictory
4	adcmnf.sas	OringalDirectory/adcmnf.sas	cp OringalDirectory/adcmnf.sas TargetDictory
5	adecog.sas	OringalDirectory/adecog.sas	cp OringalDirectory/adecog.sas TargetDictory
6	adeff.sas	OringalDirectory/adeff.sas	cp OringalDirectory/adeff.sas TargetDictory
7	adeg.sas	OringalDirectory/adeg.sas	cp OringalDirectory/adeg.sas TargetDictory
8	adex.sas	OringalDirectory/adex.sas	cp OringalDirectory/adex.sas TargetDictory
9	adexsum.sas	OringalDirectory/adexsum.sas	cp OringalDirectory/adexsum.sas TargetDictory
10	adhyslaw.sas	OringalDirectory/adhyslaw.sas	cp OringalDirectory/adhyslaw.sas TargetDictory
11	adlb.sas	OringalDirectory/adlb.sas	cp OringalDirectory/adlb.sas TargetDictory
12	adlbtox.sas	OringalDirectory/adlbtox.sas	cp OringalDirectory/adlbtox.sas TargetDictory
13	admo.sas	OringalDirectory/admo.sas	cp OringalDirectory/admo.sas TargetDictory
14	adpro.sas	OringalDirectory/adpro.sas	cp OringalDirectory/adpro.sas TargetDictory
15	adrecist.sas	OringalDirectory/adrecist.sas	cp OringalDirectory/adrecist.sas TargetDictory
16	adrs.sas	OringalDirectory/adrs.sas	cp OringalDirectory/adrs.sas TargetDictory
17	adsl.sas	OringalDirectory/adsl.sas	cp OringalDirectory/adsl.sas TargetDictory
18	adtteef.sas	OringalDirectory/adtteef.sas	cp OringalDirectory/adtteef.sas TargetDictory
19	adttepro.sas	OringalDirectory/adttepro.sas	cp OringalDirectory/adttepro.sas TargetDictory
20	adv.sas	OringalDirectory/adv.sas	cp OringalDirectory/adv.sas TargetDictory



Command line Copy?

```
data mcrpds;  
  set used_list;  
  
  mcrname = lowercase(macroname);  
  orgfile = cats("&orgdir3.", "/", mcrname, ".sas");  
  cmdline = cat("cp ", trim(left(orgfile)), " &trgdir3.");  
  
  call system(cmdline);  
run;
```



Command line Find?

Call system (“**grep** ‘**string**’ <program path 1/program name>”) ;



Command line Find?

```
Call system ("grep 'string' <program path 1/program name>" );  
RC=system("grep 'string' <program path 1/program name>");
```

Exit code 0 = Successful completion

Exit code 1 = Failure

Exit code 127 = syntax is incorrect



Command line Find?

```
data test;  
  length cmd $256;  
  cmd="grep 'example' /filepath/Test.txt";  
  call system(cmd);  
  rc=system(cmd);  
run;
```





Command line Find?

```
data test;  
  length cmd $256;  
  cmd="grep 'example' /filepath/Test.txt";  
  call system(cmd);  
  rc=system(cmd);  
run;
```

Total rows: 1 Total columns: 2

	CMD	RC
1	grep 'example' /filepath/Test.txt	0



Command line Find?

```
data search;  
  set programs;  
  
  pgmname=lowcase(pgmname);  
  orgfile=cats("/filepath", "/", pgmname)  
  cmdline=cats("grep -i", "'James'",trim(orgfile));  
  
  rc=system(cmdline); *use rc=system(cmdline) to get return code rc, 0=success, 1 failure;  
run;
```



Command line Find?

Total rows: 20 Total columns: 5

	PGMNAME	CMDLINE	RC
1	adae.sas	grep -i 'James' /filepath/adae.sas	0
2	adbd.c.sas	grep -i 'James' /filepath/adbd.c.sas	0
3	adcm.sas	grep -i 'James' /filepath/adcm.sas	0
4	adcm.inf.sas	grep -i 'James' /filepath/adcm.inf.sas	0
5	adecog.sas	grep -i 'James' /filepath/adecog.sas	1
6	adef.sas	grep -i 'James' /filepath/adef.sas	1
7	adeg.sas	grep -i 'James' /filepath/adeg.sas	0
8	adex.sas	grep -i 'James' /filepath/adex.sas	0
9	adexsum.sas	grep -i 'James' /filepath/adexsum.sas	0



How to call in R

Proc iml;

submit / R ;

<R Code>

Endsubmit;

Quit;



R

- SAS cannot open R datasets, but R can output to sas using the Haven package



Python

Proc fcmp

declare object py(python);

Submit into py;

<Pyhton code>

Endsubmit;

Run;



Warnings

- Produce the code outside of the call before implementing it.
- Readability is lost.



Questions?



The Global Healthcare Data Science Community

Contact Channels

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