

# SAS and ZIP files

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# ZIP files

- Compress to save space -> smaller files to store and send
- Package related files together
- Password protect sensitive data
- Tools: WinZip, 7-Zip, gzip, native support in Windows



# SAS support for ZIP files

- ODS PACKAGE -> publish SAS output to zip archive
- FILENAME ZIP -> read, write zip files ad hoc
- System calls: X, CALL SYSTEM, %SYSEXEC -> anything! e.g., needed for passwords

# Create ZIP files with ODS PACKAGE

- Since SAS 9.2
- <http://support.sas.com/resources/papers/proceedings09/018-2009.pdf>
- <https://blogs.sas.com/content/sasdummys/2014/01/28/create-zip-ods-package/>

SAS Global Forum 2009 Applications Development

Paper 018-2009

**ODS Packages: Putting Some Zip in Your ODS Output**  
Eric Gebhart, SAS Institute Inc., Cary, NC


**ABSTRACT**

Packages and package templates add powerful new abilities to the Output Delivery System (ODS). They allow you to create zip files and SAS packages that contain all the output generated from your SAS® program. ODS packages make it easy to e-mail your ODS output to others and can help keep your file system clear of file clutter.

With SAS® Integration Technologies, ODS packages can also publish to WebDAV, e-mail, queues, and as well as archives.

ODS packages are also completely integrated with tagsets allowing for fully automatic generation of PDF files. The creation of some of the newer file formats like Open Document Format and Microsoft Office 2007.

Learn how easy it is to use ODS packages and find out how they will impact the future of ODS.

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## Using SAS and ODS PACKAGE to create ZIP files

By [Chris Hemedinger](#) on [The SAS Dummy](#) | January 28, 2014

SAS users are big data consumers and big data creators. Often, we have to deal in large data files (or many smaller files) -- and that means ZIP compression. ZIP compression tools such as [gzip](#), [7-Zip](#), and [WinZip](#) are ubiquitous, but they aren't always convenient to use from within a SAS program. To use an external ZIP utility, you must issue a shell command via the X command or SYSTASK function, and that's not always possible within today's complex SAS environments.



```
1 /* Use ODS PACKAGE to publish results of procs as a zip archive */
2
3 ods package open;
4
5 ods html package file='/folders/myfolders/results.html';
6 ods pdf package file='/folders/myfolders/results.pdf';
7 ods rtf package file='/folders/myfolders/results.rtf';
8
9 .....
9 proc print data=sashelp.class;
10 run;
11 .....
11 proc means data=sashelp.class;
12 run;
13 quit;
14
15 ods html close;
16 ods pdf close;
17 ods rtf close;
18
19 ods package publish archive properties
20   (archive_name="package.zip" archive_path="/folders/myfolders/");
21
22 ods package close;
23
```

# Output

Obs	Name	Sex	Age	Height	Weight
1	Alfred	M	14	89.0	112.5
2	Alice	F	13	58.5	84.0
3	Barbara	F	13	65.3	98.0
4	Carol	F	14	62.8	102.5
5	Henry	M	14	63.5	102.5
6	James	M	12	57.3	83.0
7	Jane	F	12	59.8	84.5
8	Janet	F	15	62.5	112.5
9	Jeffrey	M	13	62.5	84.0
10	John	M	12	59.0	99.5
11	Joyce	F	11	51.3	50.5
12	Judy	F	14	64.3	90.0
13	Louise	F	12	58.3	77.0
14	Mary	F	15	66.5	112.0
15	Philip	M	16	72.0	150.0
16	Robert	M	12	64.8	128.0
17	Ronald	M	15	67.0	133.0
18	Thomas	M	11	57.5	85.0
19	William	M	15	66.5	112.0

## The MEANS Procedure

Variable	N	Mean	Std Dev	Minimum	Maximum
Age	19	13.3157895	1.4926722	11.0000000	16.0000000
Height	19	62.3368421	5.1270752	51.3000000	72.0000000
Weight	19	100.0263158	22.7739335	50.5000000	150.0000000

# Contents of ZIP file

The screenshot shows the 7-Zip application window with the following details:

- Window Title:** C:\Users\campbg\AppData\Local\Temp\package-4.zip\
- Menu Bar:** File, Edit, View, Favorites, Tools, Help
- Toolbar:** Add, Extract, Test, Copy, Move, Delete, Info
- Address Bar:** C:\Users\campbg\AppData\Local\Temp\package-4.zip\
- File List:**

Name	Size	Packed Size	Modified	Created	Accessed
results.html	41 118	3 116	2017-10-19 17:16		
results.pdf	91 983	85 653	2017-10-19 17:16		
results.rtf	28 801	1 807	2017-10-19 17:16		

**About 7-Zip Dialog Box:**

- Logo:** 7 ZIP
- Version:** 7-Zip 9.20
- Copyright:** Copyright (c) 1999-2010 Igor Pavlov
- License:** 7-Zip is free software
- Buttons:** www.7-zip.org, OK

0 object(s) selected

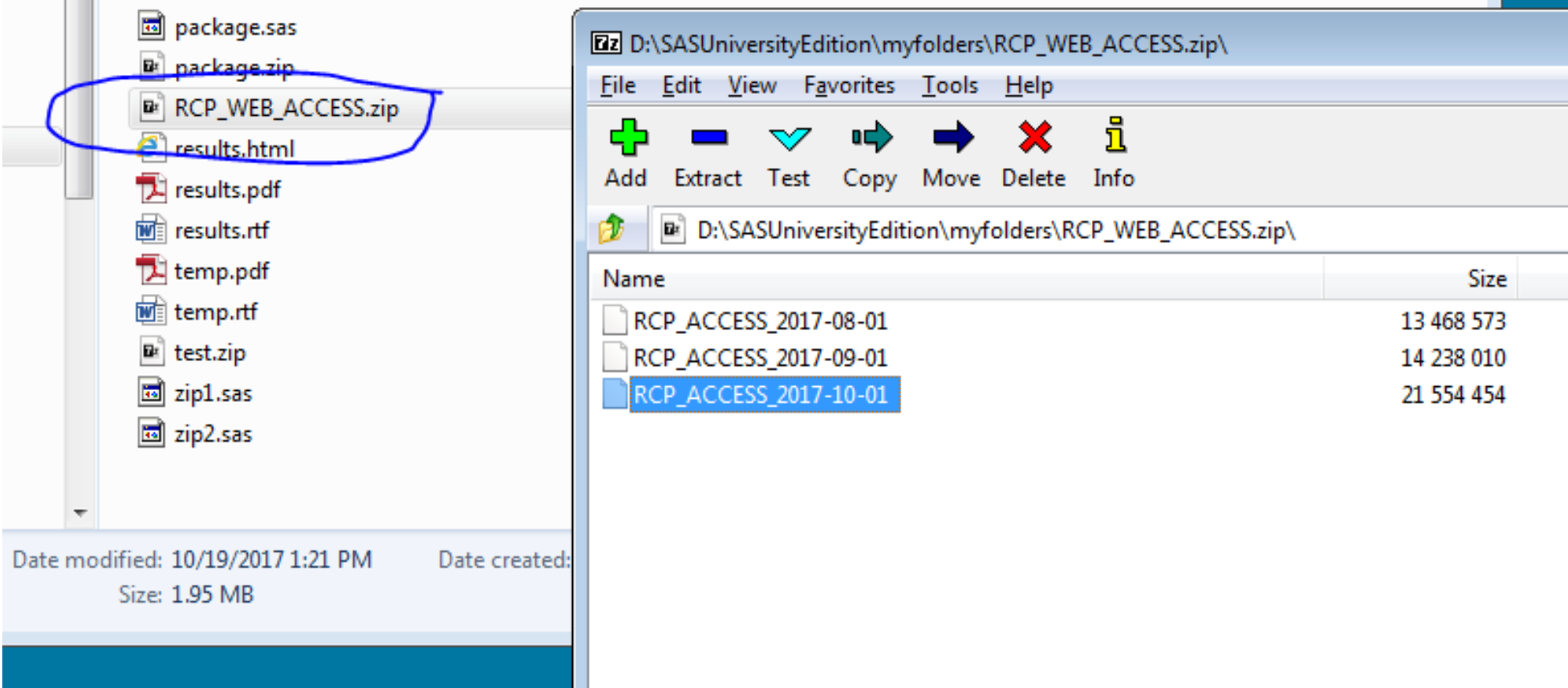
# Read and write ZIP files using FILENAME ZIP

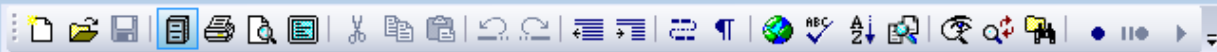
- Available since SAS 9.4
- <https://blogs.sas.com/content/sasdummys/2014/01/29/using-filename-zip>
- <http://documentation.sas.com/?docsetId=lestmsglobal&docsetTarget=n1dn0f61yfyzton1l2ngsa1c1llr.htm&docsetVersion=9.4&locale=en>

The image shows two overlapping screenshots from the SAS website. The background screenshot is a blog post titled "Reading and updating ZIP files with FILENAME ZIP" by Chris Hemedinger on The SAS Dummy, dated January 29, 2014. The foreground screenshot is the SAS 9.4 Global Statements: Reference page for the FILENAME Statement, ZIP Access Method. The blog post text includes: "In a previous post, I shared an example of using ODS PACKAGE to create ZIP files. But what if you need to read a ZIP file in your SAS program? In SAS 9.4, you can use the FILENAME ZIP access method to do the job." and "In this example, let's pretend that I need to analyze data that a government agency published (maybe by using SAS!) into a dataset. I've selected an exciting data source (found via data.gov) about Large Truck Crash Causation." The documentation page shows a list of FILENAME access methods on the left, with "FILENAME Statement, ZIP Access Method" selected. The main content area of the documentation page includes the title "FILENAME Statement, ZIP Access Method", a description "Enables you to access ZIP files.", "Valid in: Anywhere", "Category: Data Access", and a "Note: The ZIP access method reads and writes only files created with the WinZip file compression." Below this is a "Table of Contents" section with links for "Syntax" (Arguments, ZIP Options), "Examples" (Example 1: Reading a ZIP File Member from a Directory, Example 2: Writing a ZIP File to a New Member of a Directory, Example 3: Reading from a Member of a Directory), and "See Also".



# ZIP file containing web access logs

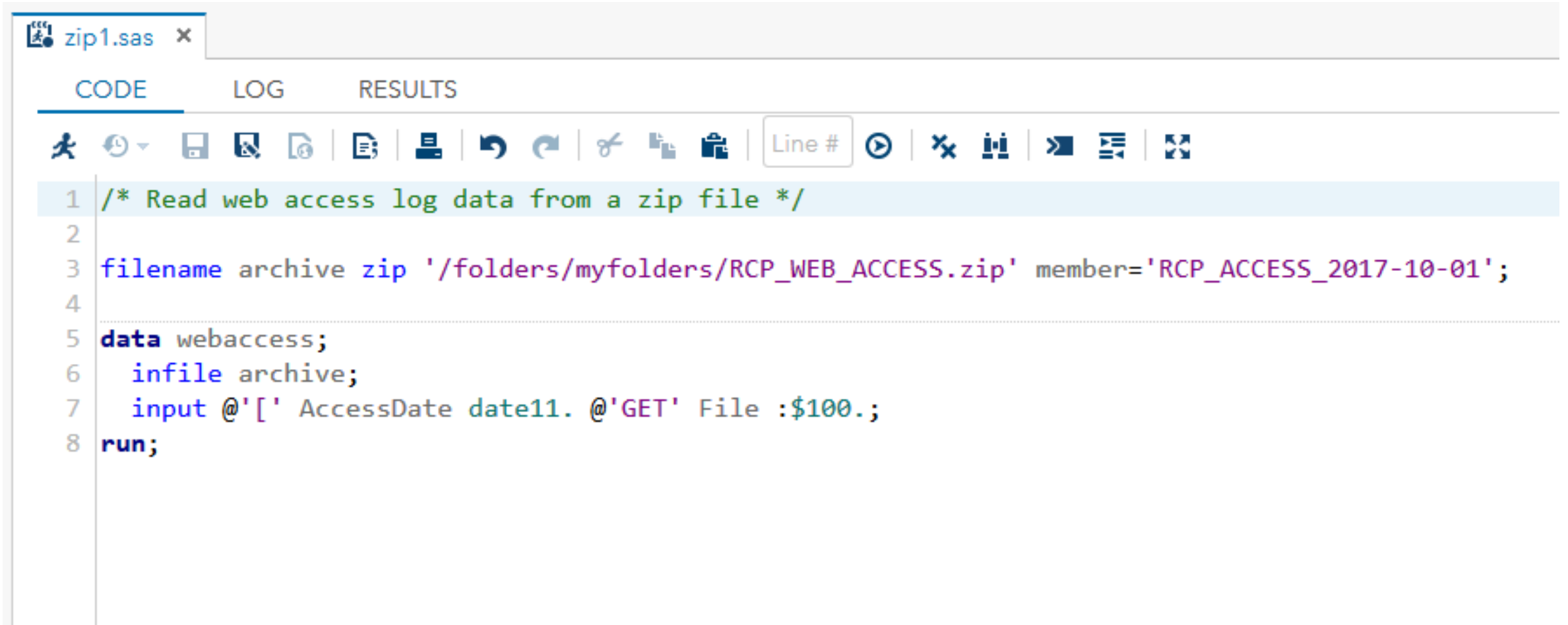




## RCP\_ACCESS\_2017-10-01

```
/var/log/httpd/access_log:89.249.134.77 - - [24/Sep/2017:03:45:25 -0300] "POST /user HTTP/1.1" 200 12129 "https://rcp.nshealth.ca/user" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:45.55.27.246 - - [24/Sep/2017:05:16:31 -0300] "GET /events/alarm-course-201510 HTTP/1.1" 200 4052 "http://rcp.nshealth.ca/" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:101.186.186.216 - - [24/Sep/2017:05:26:07 -0300] "GET /favicon.ico HTTP/1.1" 200 34494 "http://rcp.nshealth.ca/sites/default/files/favicon.ico" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:101.186.186.216 - - [24/Sep/2017:05:26:08 -0300] "GET /sites/default/files/clinical-practice-guidelines/fentany1.pdf HTTP/1.1" 200 104848 "http://rcp.nshealth.ca/sites/default/files/clinical-practice-guidelines/fentany1.pdf" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:79.134.198.229 - - [24/Sep/2017:05:36:10 -0300] "GET /user HTTP/1.1" 200 3400 "https://rcp.nshealth.ca/user" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.80 - - [24/Sep/2017:05:49:57 -0300] "GET /modules/system/system.base.css?ov1lkx HTTP/1.1" 200 5428 "http://rcp.nshealth.ca/modules/system/system.base.css?ov1lkx" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.78 - - [24/Sep/2017:05:49:57 -0300] "GET /sites/all/modules/simplenews/simplenews.css?ov1lkx HTTP/1.1" 200 503 "http://rcp.nshealth.ca/sites/all/modules/simplenews/simplenews.css?ov1lkx" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.79 - - [24/Sep/2017:05:49:57 -0300] "GET /modules/comment/comment.css?ov1lkx HTTP/1.1" 200 184 "http://rcp.nshealth.ca/modules/comment/comment.css?ov1lkx" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.92 - - [24/Sep/2017:05:49:57 -0300] "GET /sites/all/modules/date/date_api/date.css?ov1lkx HTTP/1.1" 200 3733 "http://rcp.nshealth.ca/sites/all/modules/date/date_api/date.css?ov1lkx" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.92 - - [24/Sep/2017:05:49:57 -0300] "GET /sites/all/modules/date/date_popup/themes/datepicker.1.7.css?ov1lkx HTTP/1.1" 200 1048 "http://rcp.nshealth.ca/sites/all/modules/date/date_popup/themes/datepicker.1.7.css?ov1lkx" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.83 - - [24/Sep/2017:05:49:57 -0300] "GET /modules/field/theme/field.css?ov1lkx HTTP/1.1" 200 550 "http://rcp.nshealth.ca/modules/field/theme/field.css?ov1lkx" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.85 - - [24/Sep/2017:05:49:57 -0300] "GET /sites/all/modules/google_appliance/theme/google_appliance.css?ov1lkx HTTP/1.1" 200 1048 "http://rcp.nshealth.ca/sites/all/modules/google_appliance/theme/google_appliance.css?ov1lkx" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.77 - - [24/Sep/2017:05:49:57 -0300] "GET /sites/all/modules/logintoboggan/logintoboggan.css?ov1lkx HTTP/1.1" 200 991 "http://rcp.nshealth.ca/sites/all/modules/logintoboggan/logintoboggan.css?ov1lkx" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.94 - - [24/Sep/2017:05:49:57 -0300] "GET /modules/node/node.css?ov1lkx HTTP/1.1" 200 144 "http://rcp.nshealth.ca/modules/node/node.css?ov1lkx" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.90 - - [24/Sep/2017:05:49:57 -0300] "GET /modules/search/search.css?ov1lkx HTTP/1.1" 200 564 "http://rcp.nshealth.ca/modules/search/search.css?ov1lkx" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.81 - - [24/Sep/2017:05:49:57 -0300] "GET /modules/user/user.css?ov1lkx HTTP/1.1" 200 1827 "http://rcp.nshealth.ca/modules/user/user.css?ov1lkx" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.70 - - [24/Sep/2017:05:49:57 -0300] "GET /sites/all/modules/extlink/extlink.css?ov1lkx HTTP/1.1" 200 424 "http://rcp.nshealth.ca/sites/all/modules/extlink/extlink.css?ov1lkx" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.70 - - [24/Sep/2017:05:49:57 -0300] "GET /modules/forum/forum.css?ov1lkx HTTP/1.1" 200 1056 "http://rcp.nshealth.ca/modules/forum/forum.css?ov1lkx" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.74 - - [24/Sep/2017:05:49:57 -0300] "GET /sites/all/modules/views/css/views.css?ov1lkx HTTP/1.1" 200 707 "http://rcp.nshealth.ca/sites/all/modules/views/css/views.css?ov1lkx" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.81 - - [24/Sep/2017:05:49:57 -0300] "GET /sites/all/themes/rcp/css/styles.css?ov1lkx HTTP/1.1" 200 647 "http://rcp.nshealth.ca/sites/all/themes/rcp/css/styles.css?ov1lkx" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.82 - - [24/Sep/2017:05:49:57 -0300] "GET /sites/all/modules/ctools/css/ctools.css?ov1lkx HTTP/1.1" 200 509 "http://rcp.nshealth.ca/sites/all/modules/ctools/css/ctools.css?ov1lkx" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.79 - - [24/Sep/2017:05:49:58 -0300] "GET /misc/jquery.once.js?v=1.2 HTTP/1.1" 200 2974 "http://rcp.nshealth.ca/misc/jquery.once.js?v=1.2" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.89 - - [24/Sep/2017:05:49:58 -0300] "GET /sites/all/modules/jquery_update/replace/jquery/1.10/jquery.min.js?v=1.10.2 HTTP/1.1" 200 1048 "http://rcp.nshealth.ca/sites/all/modules/jquery_update/replace/jquery/1.10/jquery.min.js?v=1.10.2" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.82 - - [24/Sep/2017:05:49:58 -0300] "GET /misc/drupal.js?ov1lkx HTTP/1.1" 200 18907 "http://rcp.nshealth.ca/misc/drupal.js?ov1lkx" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.83 - - [24/Sep/2017:05:49:58 -0300] "GET /sites/all/modules/ckeditor/css/ckeditor.css?ov1lkx HTTP/1.1" 200 431 "http://rcp.nshealth.ca/sites/all/modules/ckeditor/css/ckeditor.css?ov1lkx" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.65 - - [24/Sep/2017:05:49:58 -0300] "GET /sites/all/modules/extlink/extlink.js?ov1lkx HTTP/1.1" 200 5759 "http://rcp.nshealth.ca/sites/all/modules/extlink/extlink.js?ov1lkx" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.70 - - [24/Sep/2017:05:50:01 -0300] "GET /sites/all/themes/rcp/css/normalize.css HTTP/1.1" 200 13256 "http://rcp.nshealth.ca/sites/all/themes/rcp/css/normalize.css" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.75 - - [24/Sep/2017:05:50:01 -0300] "GET /sites/all/themes/rcp/css/layouts/fix.css HTTP/1.1" 200 2902 "http://rcp.nshealth.ca/sites/all/themes/rcp/css/layouts/fix.css" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.84 - - [24/Sep/2017:05:50:01 -0300] "GET /sites/all/themes/rcp/css/components/misc.css HTTP/1.1" 200 21060 "http://rcp.nshealth.ca/sites/all/themes/rcp/css/components/misc.css" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.94 - - [24/Sep/2017:05:50:01 -0300] "GET /sites/all/themes/rcp/css/print.css HTTP/1.1" 200 1591 "http://rcp.nshealth.ca/sites/all/themes/rcp/css/print.css" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:131.253.25.89 - - [24/Sep/2017:05:50:01 -0300] "GET /sites/all/themes/rcp/css/rcp.css HTTP/1.1" 200 15342 "http://rcp.nshealth.ca/sites/all/themes/rcp/css/rcp.css" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:66.249.64.74 - - [24/Sep/2017:06:02:49 -0300] "GET /sites/all/modules/views/css/views.css?ov1lkx HTTP/1.1" 200 707 "http://rcp.nshealth.ca/sites/all/modules/views/css/views.css?ov1lkx" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:66.249.64.74 - - [24/Sep/2017:06:02:50 -0300] "GET /sites/all/modules/date/date_api/date.css?ov1lkx HTTP/1.1" 200 3733 "http://rcp.nshealth.ca/sites/all/modules/date/date_api/date.css?ov1lkx" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
/var/log/httpd/access_log:66.249.64.74 - - [24/Sep/2017:06:02:50 -0300] "GET /sites/all/modules/ckeditor/css/ckeditor.css?ov1lkx HTTP/1.1" 200 431 "http://rcp.nshealth.ca/sites/all/modules/ckeditor/css/ckeditor.css?ov1lkx" "Mozilla/5.0 (Windows NT 6.1; Win64; x64; rv:53.0) Gecko/20100101 Firefox/53.0"
```

# Read and write ZIP files using FILENAME ZIP



The image shows a screenshot of the SAS Studio editor interface. At the top, there is a tab labeled 'zip1.sas'. Below the tab are three main sections: 'CODE', 'LOG', and 'RESULTS'. The 'CODE' section is active and contains a SAS program. The program is as follows:

```
1 /* Read web access log data from a zip file */
2
3 filename archive zip '/folders/myfolders/RCP_WEB_ACCESS.zip' member='RCP_ACCESS_2017-10-01';
4
5 data webaccess;
6   infile archive;
7   input @'[' AccessDate date11. @'GET' File :$100.;
8 run;
```

- ▶ Server Files and Folders
- ▶ Tasks and Utilities
- ▶ Snippets
- ▼ Libraries
  - 📁 My Libraries
    - ▶ 📁 APFMTLIB
    - ▶ 📁 SASHELP
    - 📁 SASUSER
    - 📁 WEBWORK
    - ▶ 📁 WORK
      - ▶ 📁 WEBACCESS

zip1.sas

CODE
LOG
RESULTS
OUTPUT DATA

Table: WORK.WEBACCESS | View: Column names | 
 📄 🖨️ ↺ 📄 🗑️ Filter: (none)

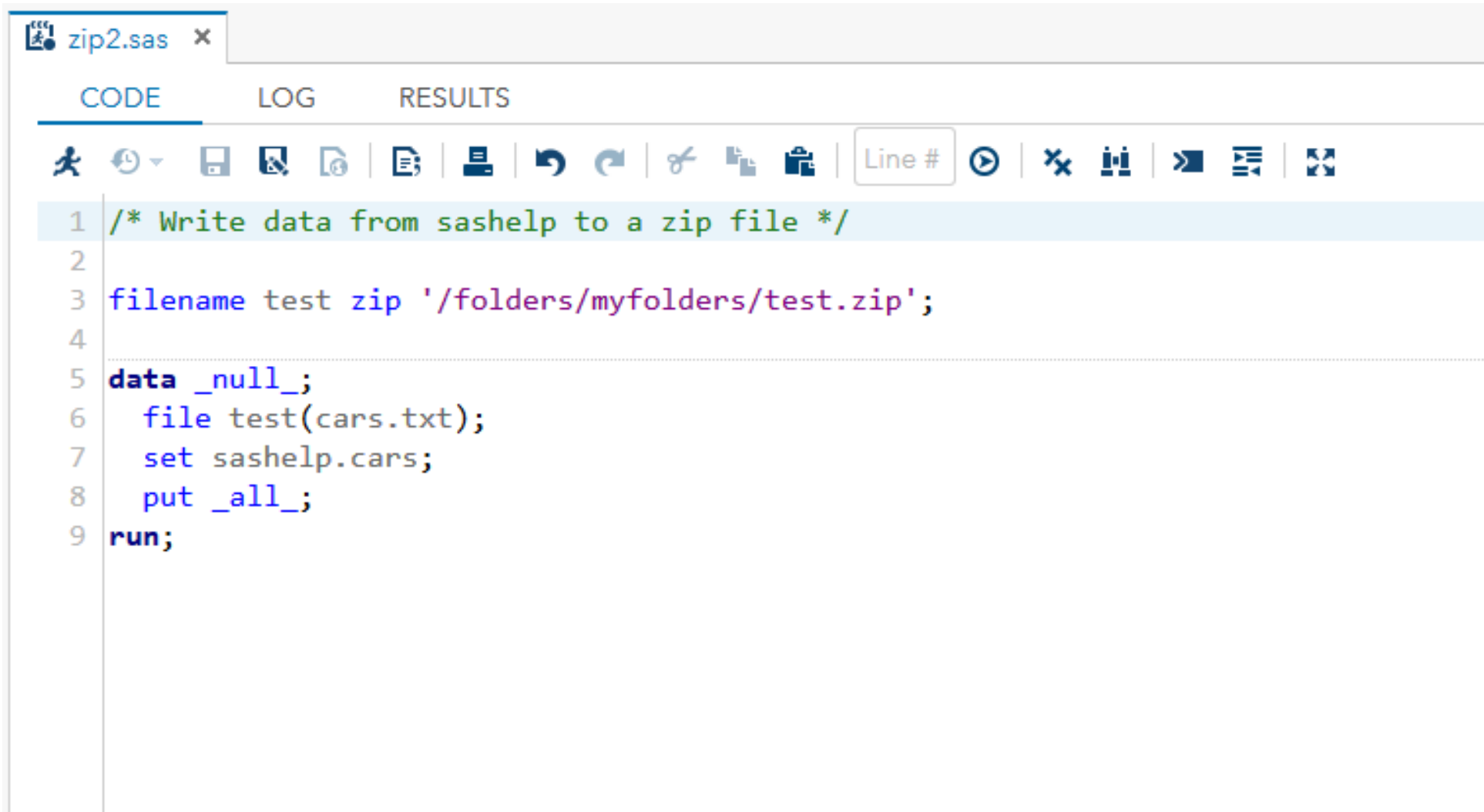
Columns
ⓘ
Total rows: 65762 Total columns: 2
⏪ ⏩ Rows 1-100 ⏪ ⏩

	AccessDate	File
1	24SEP17	/events/alarm-course-201510
2	24SEP17	/favicon.ico
3	24SEP17	/sites/default/files/clinical-practice-guidelines/fentanyl.pdf
4	24SEP17	/user
5	24SEP17	/modules/system/system.base.css?ov1lkx
6	24SEP17	/sites/all/modules/simplenews/simplenews.css?ov1lkx
7	24SEP17	/modules/comment/comment.css?ov1lkx
8	24SEP17	/sites/all/modules/date/date_api/date.css?ov1lkx
9	24SEP17	/sites/all/modules/date/date_popup/themes/datepicker.1.7.css?ov1lkx
10	24SEP17	/modules/field/theme/field.css?ov1lkx
11	24SEP17	/sites/all/modules/google_appliance/theme/google_appliance.css?ov1lkx
12	24SEP17	/sites/all/modules/logintoboggan/logintoboggan.css?ov1lkx
13	24SEP17	/modules/node/node.css?ov1lkx

Property	Value
Label	
Name	
Length	
Type	

▶ File Shortcuts

# Using FILENAME ZIP to write to a zip file



The image shows a screenshot of the SAS Studio editor interface. The window title is 'zip2.sas'. The editor is in 'CODE' mode. The code is as follows:

```
1 /* Write data from sashelp to a zip file */
2
3 filename test zip '/folders/myfolders/test.zip';
4
5 data _null_;
6   file test(cars.txt);
7   set sashelp.cars;
8   put _all_;
9 run;
```

DATA PART1 (D:) > SASUniversityEdition > myfol

Burn New folder

Name

- .images
- .local
- .sasstudio
- .uestart
- .wepreferences
- sasuser.v94
- temp
- email.sas
- http.sas
- package.sas
- package.zip
- RCP\_WEB\_ACCESS.zip
- results.html
- results.pdf
- results.rtf
- temp.pdf
- temp.rtf
- test.zip
- zip1.sas
- zip2.sas

D:\SASUniversityEdition\myfolders\test.zip\

File Edit View Favorites Tools Help

Add Extract Test Copy Move Delete Info

D:\SASUniversityEdition\myfolders\test.zip\

Name	Size	Packed Size	Modified	Created	Accessed
cars.txt	96 547	14 211	2017-10-19 21:06		

TextPad - C:\Users\campbg\Desktop\cars.txt

File Edit Search View Tools Macros Configure Window Help

Find incrementally Match case

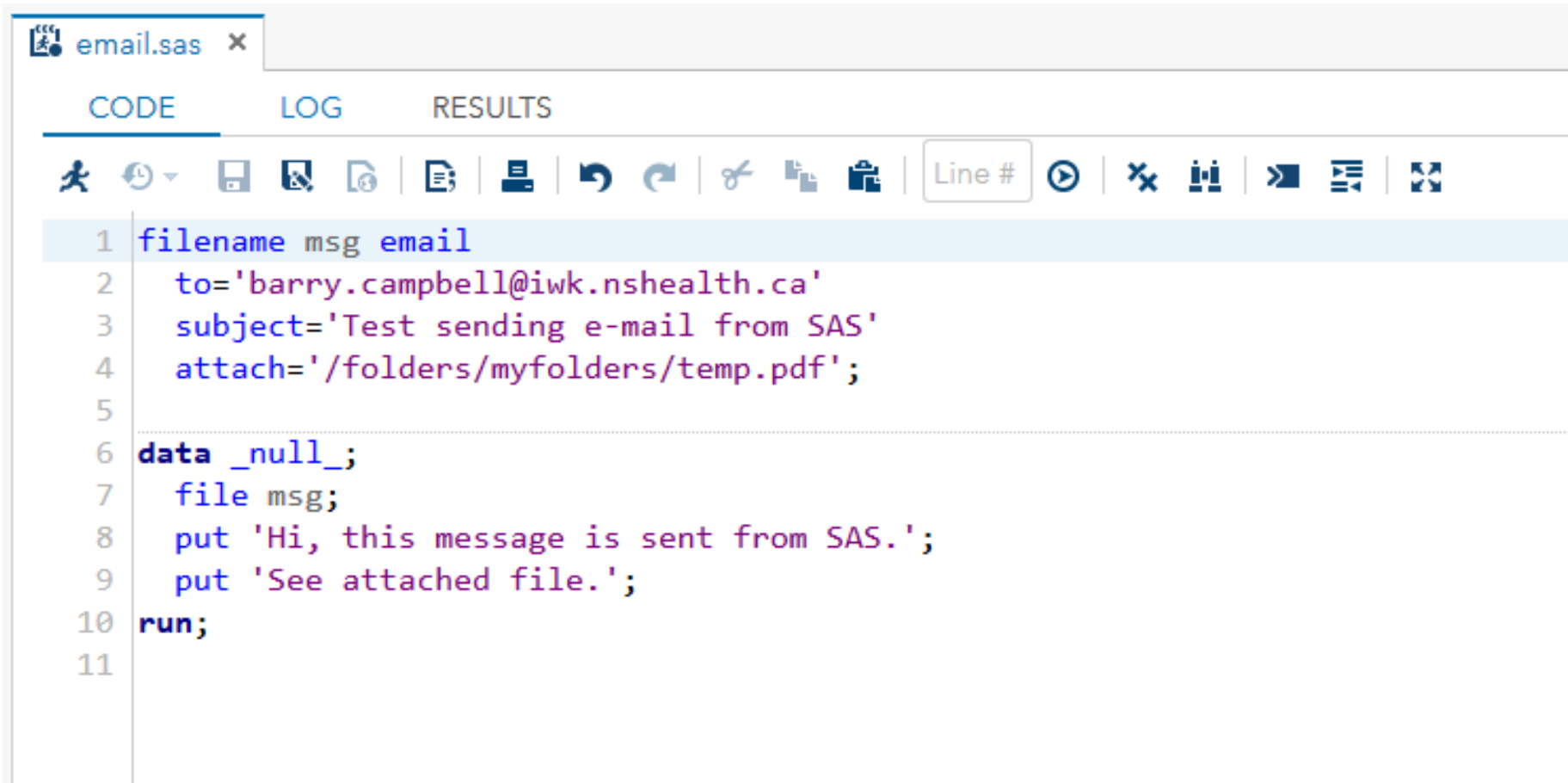
cars.txt

```
Make=Acura Model=MDX Type=SUV Origin=Asia DriveTrain=All MSRP=$36,945 Invoice=$33,337 EngineSize=
Make=Acura Model=RSX Type S 2dr Type=Sedan Origin=Asia DriveTrain=Front MSRP=$23,820 Invoice=$21,
Make=Acura Model=TSX 4dr Type=Sedan Origin=Asia DriveTrain=Front MSRP=$26,990 Invoice=$24,647 Eng
Make=Acura Model=TL 4dr Type=Sedan Origin=Asia DriveTrain=Front MSRP=$33,195 Invoice=$30,299 Engr
Make=Acura Model=3.5 RL 4dr Type=Sedan Origin=Asia DriveTrain=Front MSRP=$43,755 Invoice=$39,014
Make=Acura Model=3.5 RL w/Navigation 4dr Type=Sedan Origin=Asia DriveTrain=Front MSRP=$46,100 Inv
Make=Acura Model=NSX coupe 2dr manual S Type=Sports Origin=Asia DriveTrain=Rear MSRP=$89,765 Invo
Make=Audi Model=A4 1.8T 4dr Type=Sedan Origin=Europe DriveTrain=Front MSRP=$25,940 Invoice=$23,50
Make=Audi Model=A41.8T convertible 2dr Type=Sedan Origin=Europe DriveTrain=Front MSRP=$35,940 Inv
Make=Audi Model=A4 3.0 4dr Type=Sedan Origin=Europe DriveTrain=Front MSRP=$31,840 Invoice=$28,846
Make=Audi Model=A4 3.0 Quattro 4dr manual Type=Sedan Origin=Europe DriveTrain=All MSRP=$33,430 In
Make=Audi Model=A4 3.0 Quattro 4dr auto Type=Sedan Origin=Europe DriveTrain=All MSRP=$34,480 Invo
Make=Audi Model=A6 3.0 4dr Type=Sedan Origin=Europe DriveTrain=Front MSRP=$36,640 Invoice=$33,129
Make=Audi Model=A6 3.0 Quattro 4dr Type=Sedan Origin=Europe DriveTrain=All MSRP=$39,640 Invoice=$
Make=Audi Model=A4 3.0 convertible 2dr Type=Sedan Origin=Europe DriveTrain=Front MSRP=$42,490 Inv
Make=Audi Model=A4 3.0 Quattro convertible 2dr Type=Sedan Origin=Europe DriveTrain=All MSRP=$44,2
Make=Audi Model=A6 2.7 Turbo Quattro 4dr Type=Sedan Origin=Europe DriveTrain=All MSRP=$42,840 Inv
Make=Audi Model=A6 4.2 Quattro 4dr Type=Sedan Origin=Europe DriveTrain=All MSRP=$49,690 Invoice=$
Make=Audi Model=A8 L Quattro 4dr Type=Sedan Origin=Europe DriveTrain=All MSRP=$69,190 Invoice=$64
Make=Audi Model=S4 Quattro 4dr Type=Sedan Origin=Europe DriveTrain=All MSRP=$48,040 Invoice=$43,5
Make=Audi Model=RS 6 4dr Type=Sports Origin=Europe DriveTrain=Front MSRP=$84,600 Invoice=$76,417
Make=Audi Model=TT 1.8 convertible 2dr (coupe) Type=Sports Origin=Europe DriveTrain=Front MSRP=$3
Make=Audi Model=TT 1.8 Quattro 2dr (convertible) Type=Sports Origin=Europe DriveTrain=All MSRP=$3
Make=Audi Model=TT 3.2 coupe 2dr (convertible) Type=Sports Origin=Europe DriveTrain=All MSRP=$40,
Make=Audi Model=A6 3.0 Avant Quattro Type=Wagon Origin=Europe DriveTrain=All MSRP=$40,840 Invoice
Make=Audi Model=S4 Avant Quattro Type=Wagon Origin=Europe DriveTrain=All MSRP=$49,090 Invoice=$44
Make=BMW Model=X3 3.0i Type=SUV Origin=Europe DriveTrain=All MSRP=$37,000 Invoice=$33,873 EngineS
Make=BMW Model=X5 4.4i Type=SUV Origin=Europe DriveTrain=All MSRP=$52,195 Invoice=$47,720 EngineS
```

# Example of system call to process ZIP files

```
password.sas x
CODE LOG RESULTS
* Unzip a password protected ZIP file using FILENAME PIPE
* flags for unzip: -c output to stdout, -q quiet mode, -P specify the password;
3
4 filename myfile pipe 'unzip -cq -P mypass FILE.zip' ;
5
6 data _null_;
7   infile myfile; * import file;
8   input;
9   put _infile_;
10 run;
```

# Bonus - FILENAME EMAIL

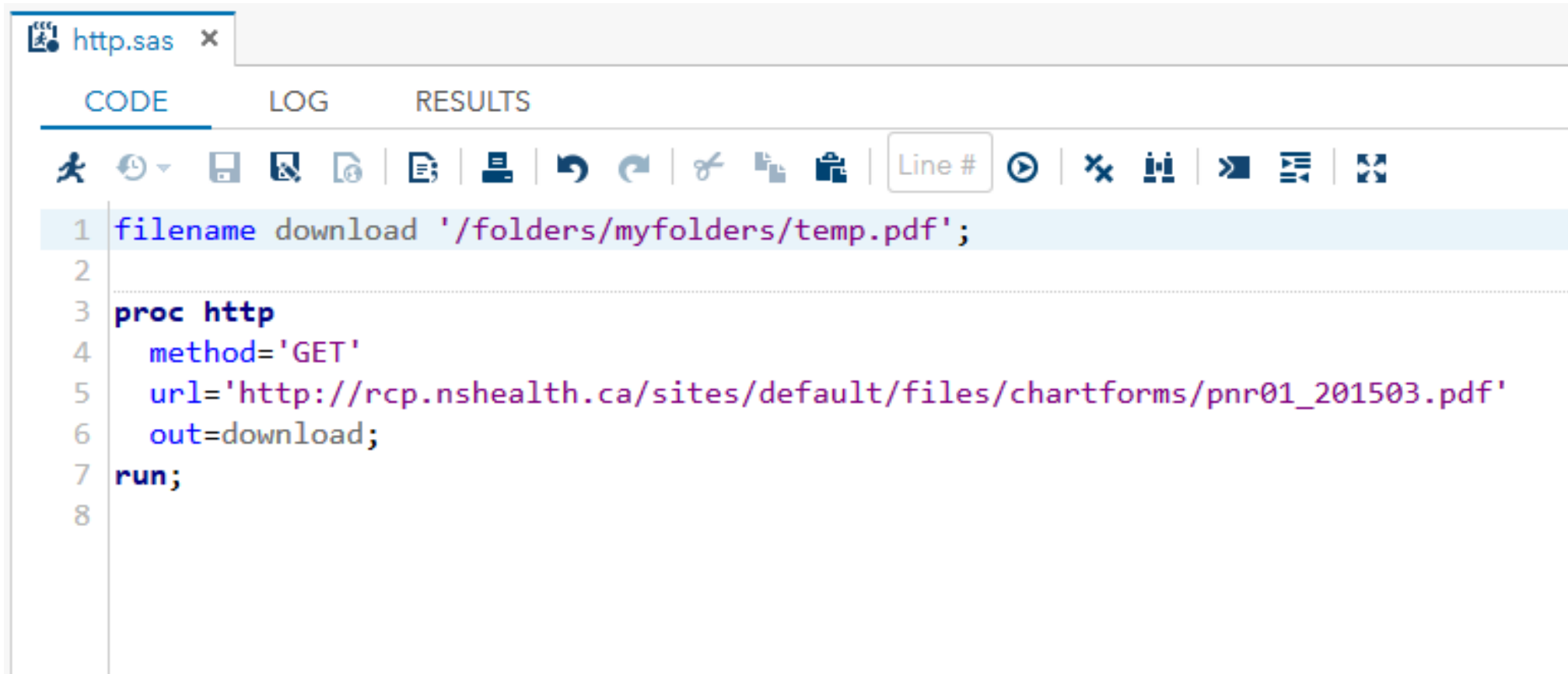


The image shows a screenshot of the SAS Studio editor interface. The window title is "email.sas". The interface includes tabs for "CODE", "LOG", and "RESULTS", with "CODE" currently selected. A toolbar with various icons is visible above the code editor. The code editor contains the following SAS code:

```
1 filename msg email
2   to='barry.campbell@iwk.nshealth.ca'
3   subject='Test sending e-mail from SAS'
4   attach='/folders/myfolders/temp.pdf';
5
6 data _null_;
7   file msg;
8   put 'Hi, this message is sent from SAS.';
9   put 'See attached file.';
10 run;
11
```



# Bonus – PROC HTTP



The image shows a screenshot of the SAS Studio editor interface. At the top, there is a tab labeled 'http.sas'. Below the tab are three main sections: 'CODE', 'LOG', and 'RESULTS'. The 'CODE' section is active and contains a toolbar with various icons for editing and execution. The code in the editor is as follows:

```
1 filename download '/folders/myfolders/temp.pdf';  
2  
3 proc http  
4   method='GET'  
5   url='http://rcp.nshealth.ca/sites/default/files/chartforms/pnr01_201503.pdf'  
6   out=download;  
7 run;  
8
```

Thank you!  
Questions?

