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# Microsoft Excel Proficiency with SAS®: Unlocking Data Insights and Dynamic Reporting

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# Microsoft Excel Proficiency with SAS®: Unlocking Data Insights and Dynamic Reporting

Join us for an immersive experience where your command of data meets reporting excellence! Discover the art of seamlessly reading and writing Microsoft Excel data with SAS, unlocking a realm of possibilities. From Excel data ingestion to crafting dynamic reports in Excel using SAS, this session empowers you to navigate the convergence of SAS and Excel. Learn efficient SAS techniques to harness the power of both tools, ensuring a seamless workflow for comprehensive data analysis and reporting. Elevate your skills and gain the expertise needed to unleash the full potential of SAS in creating impactful Excel reports.

**Note:** The final images showcase results from Microsoft Excel. The provided virtual lab uses LibreOffice. Please note that there might be slight variations in the displayed images when opening them with LibreOffice.

1. Sign in to SAS Viya. From the applications menu that's accessed in the upper left corner, select **Develop Code and Flows** to open SAS Studio.
2. Click  in the left pane to access the Explorer. Navigate to **Files > Home > ExcelMastery**. The **workshop** folder contains the **data**, **development**, and **production** folders.

## Step 1: Development

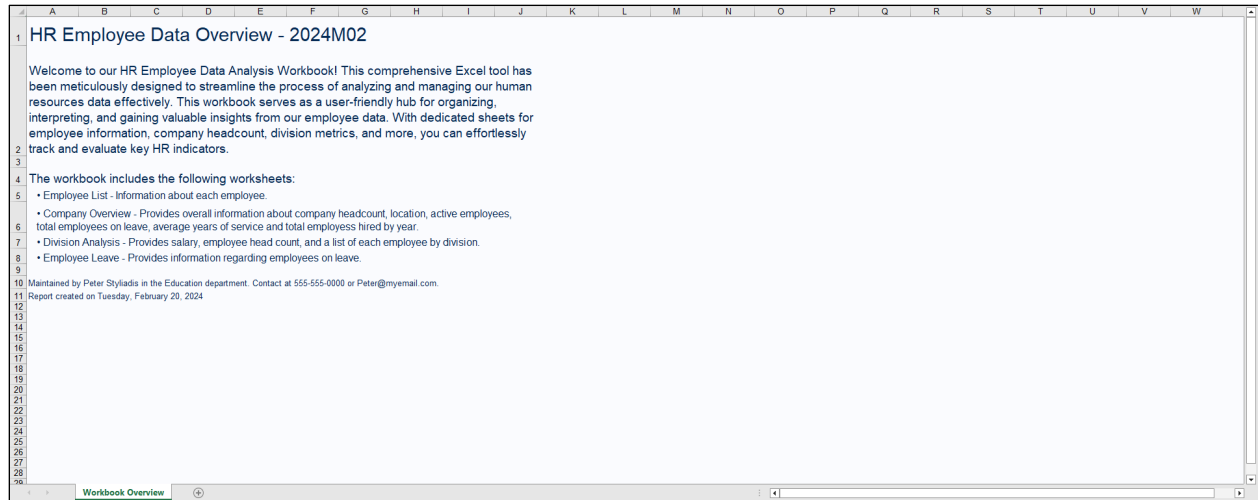
In the **development** folder, we will initiate the process to generate our final Excel workbook. To test our workflow, we'll organize each program to generate a distinct Excel workbook for each worksheet. These workbooks will be saved within the **development > output** folder. Then we will combine everything in Step 2.

1. In the **workshop** folder, expand the **development** folder.
2. Double-click the **00\_config.sas** program to open the file. This program sets up a variety of macro variables for the workshop, such as folder paths, today's date, custom colors, and fonts sizes. Run the program and confirm that it ran successfully.
3. Double-click the **01\_prepare\_data.sas** program to open the file. This program makes a connection to the **2024M04\_emp\_info\_raw.xlsx** workbook in the **data** folder using the XLSX LIBNAME engine. Then it prepares the Excel data and creates the **emp\_info\_all** and **emp\_leave** tables in the **Work** library. Run the program and view the new tables in the results.
4. Double-click the **02\_worksheet01.sas** program to open the file. The program reads in the **report\_overview\_config.xlsx** workbook from the **data** folder and uses the tables to create a new Excel workbook named **worksheet\_01.xlsx** in the **development > output** folder. The new worksheet will contain overview information about the final workbook.
  - a. Run the program and expand the **development > output** folder to view the new workbook.
  - b. Right-click the **worksheet\_01.xlsx** file and select **Download file**.

- c. Open the Excel file and view the results.

The Excel workbook will contain a single worksheet named **Workbook Overview** with information about the workbook such as a workbook overview, every worksheet that will be available, who created the report, and the date.

- d. Close the workbook.



5. Double-click the **03\_worksheet02.sas** program to open the file. The program creates an Excel workbook named **worksheet\_02.xlsx** in the **development > output** folder. The worksheet will contain a list of employees.

- a. Run the program.
- b. Right-click the **worksheet\_02.xlsx** file and select **Download file**.
- c. Open the Excel file and view the results.

The Excel workbook will contain a single worksheet named **Employee List** with a list of all employees and their information. The worksheet will contain specific row and column heights, frozen row and column headings, and an auto filter selection on the Excel table.

- d. Close the workbook.

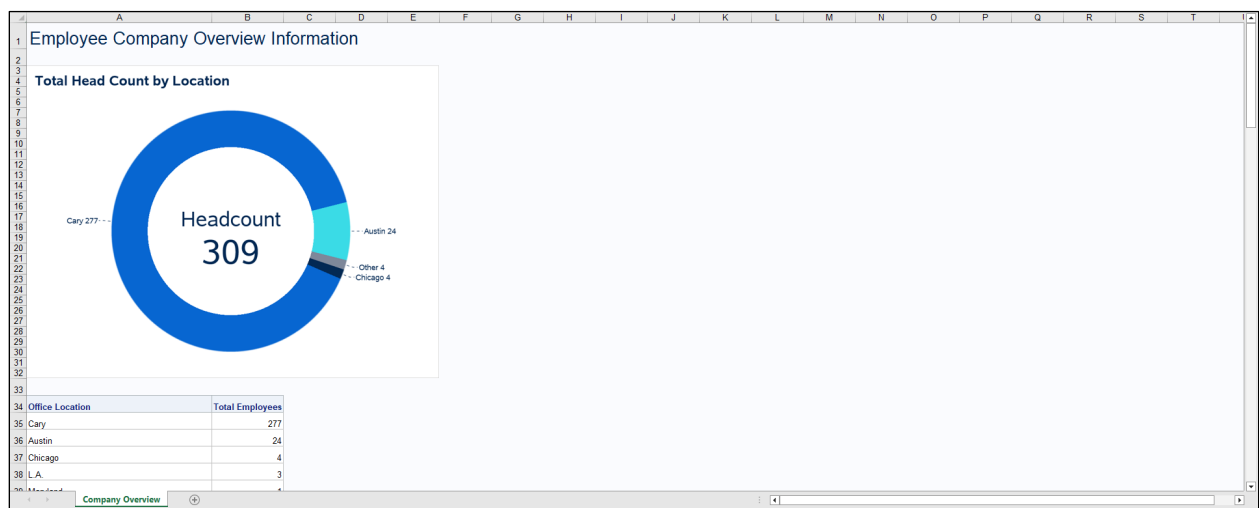
List of Employee Information										
Name	Employee Number	Division	Job Code	Job Title	Salary	Hire Dt	Years of Serv	Status	Employee Gender	Education Lev
Lavelle, Alan A.	000477	CALIFORNIA REGIONAL	CAR002	ACCOUNT REP	\$38,500.00	12Nov2016	6 N	M		14 L.A.
Cutter, Teresa R.	000460	CALIFORNIA REGIONAL	CAR001	ACCOUNT MANAGER	\$43,400.00	01Apr2013	9 N	F		16 L.A.
Lawrence, Richard A.	000664	CALIFORNIA REGIONAL	CAR002	ACCOUNT REP	\$53,200.00	10Feb2015	7 N	M		16 L.A.
Gruber, John R.	000950	CONTRACTS	CON008	FILE CLERK I	\$19,600.00	13Sep2015	7 N	M		15 Cary
Lovette, Linda L.	000903	CONTRACTS	CON004	CONTRACTS ASST I	\$21,000.00	13Oct2023	-1 N	F		20 Cary
Debra, Abra K.	000436	CONTRACTS	CON005	CONTRACTS ASST II	\$32,200.00	22Sep2019	3 N	M		15 Cary
Frey, John H.	000576	CONTRACTS	CON010	LICENSING ANALYST	\$32,200.00	20Jan2020	2 N	M		15 Cary
Randolph, Tom R.	000342	CONTRACTS	CON003	CONTRACTS ADMIN	\$33,600.00	20May2023	-1 N	M		16 Cary
Day, Patrick E.	000066	CONTRACTS	CON007	CUSTOMER SVC ADMIN	\$35,000.00	31May2018	4 N	M		16 Cary
Piqueras, Randall D.	000851	CONTRACTS	CON001	ASSOC CONT ADMIN	\$36,400.00	14Aug2012	10 N	M		15 Cary
Atalla, Ahmed	000456	CONTRACTS	CON007	CUSTOMER SVC ADMIN	\$37,800.00	01Jan2017	6 N	F		19 Cary
Salu, Mark B.	000386	CONTRACTS	CON007	CUSTOMER SVC ADMIN	\$37,800.00	04Jun2015	7 N	M		16 Cary
Powers, Paul A.	000358	CONTRACTS	CON007	CUSTOMER SVC ADMIN	\$37,800.00	28Oct2022	0 N	M		16 Cary
Orlando, Andre D.	000204	CONTRACTS	CON003	CONTRACTS ADMIN	\$37,800.00	21Mar2015	7 N	M		14 Cary
Beekman, Roberta N.	000601	CONTRACTS	CON009	INTL LICENSING SPEC	\$40,600.00	24Jun2016	6 N	F		20 Cary
Wheeler, David W.	000782	CONTRACTS	CON006	CUST ACCOUNT ADMIN	\$42,000.00	02Mar2017	5 N	F		16 Cary
Tietjen, Grace N.	000485	CONTRACTS	CON002	ASSOC MKT COUNSEL	\$43,400.00	01Jan2013	10 N	F		19 Cary
Booston, Steven R.	000045	CONTRACTS	CON001	ASSOC CONT ADMIN	\$53,200.00	15Feb2011	11 N	M		16 Cary
Mccoy, Theodora R.	000560	CONTRACTS	CON011	MARKETING COUNSEL	\$53,200.00	28Aug2012	10 N	F		17 Cary
Spies, Scott L.	000185	CONTRACTS	CON001	ASSOC CONT ADMIN	\$58,800.00	15Dec2013	9 N	M		16 Cary
Koye, Herbert J.	000924	CONTRACTS	CON012	PARALEGAL	\$63,000.00	26Mar2012	10 N	M		15 Cary
Williams, Munther V.	000047	CORPORATE COMMUNICATIONS	PUB002	ADMIN ASST II	\$37,800.00	22Sep2023	-1 N	M		14 Cary
Szeseny, Dorothy E.	000829	CORPORATE COMMUNICATIONS	PUB007	ASSOC PROOFREADER	\$49,000.00	09Jun2014	8 N	F		16 Cary

6. Double-click the **04\_worksheet03.sas** program to open the file. The program creates an Excel workbook named **worksheet\_03.xlsx** in the **development > output** folder. The worksheet will contain a series of tables and visualizations providing a company overview analysis.

- a. Run the program.
- b. Right-click the **worksheet\_03.xlsx** file and select **Download file**.
- c. Open the Excel file and view the results.

The Excel workbook will contain a single worksheet named **Company Overview** with a series of visualizations and tables.

- d. Close the workbook.

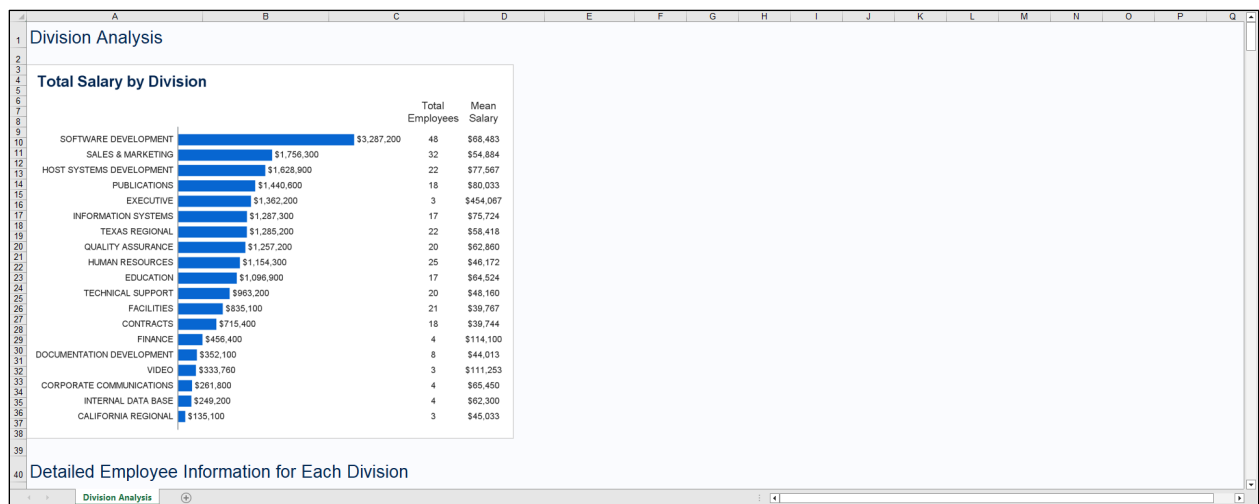


7. Double-click the **05\_worksheet04.sas** program to open the file. The program creates an Excel workbook named **worksheet\_04.xlsx** in the **development > output** folder. The worksheet will contain a visualization and a series of tables displaying division analysis.

- a. Run the program.
- b. Right-click on the **worksheet\_04.xlsx** file and select **Download file**.
- c. Open the Excel file and view the results.

The Excel workbook will contain a single worksheet named **Division Analysis** with a visualization and series of tables. Notice that the tables contain a red highlighted row if the employee is on leave.

- d. Close the workbook.



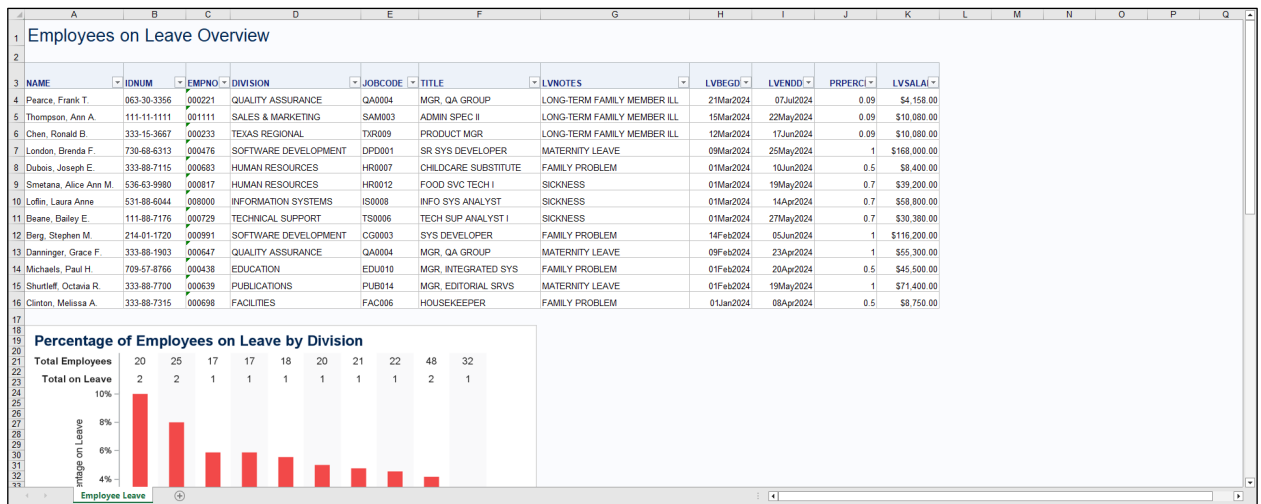
87		Sadak, Rita N.	RECEIVING CLERK II	\$54,600.00	Active
88		Rhodes, Darryn T.	RECEPTIONIST I	\$54,600.00	Active
89				<b>\$352,100.00</b>	
90					
91					
92					
93	EDUCATION	Parks, Lance H.	MEDIA DIST ASST I	\$28,700.00	Active
94		Stephens, Charles K.	ED SALES ACCT REP I	\$32,200.00	Active
95		Rameur, Walter A.	COURSE DEV SPEC I	\$33,600.00	Active
96		Owens, Joseph R.	SR RECEPTIONIST	\$33,600.00	Active
97		O'Connell, Sam B.	SR ADMIN SPEC	\$37,800.00	Active
98		Peace, Dave C.	COURSE DEV SPEC II	\$40,600.00	Active
99		Jester, Anthony C.	TRAIN CTR COORD I	\$46,200.00	Active
100		Celly, Henry W.	ASST EDUC MKT SPEC	\$46,200.00	Active
101		Mendoza, Dennis A.	ASST EDUC MKT SPEC	\$51,100.00	Active
102		Henar, Dorothy T.	SR EDUC SALES ASST	\$53,200.00	Active
103		Johnson, Blair D.	ASSOC INSTRUCTOR	\$53,200.00	Active
104		Mason, David O.	COURSE REGISTRAR	\$53,200.00	Active
105		Miller, Joseph L.	MGR, COURSE DEV	\$69,300.00	Active
106		Michaelis, Paul H.	MGR, INTEGRATED SYS	\$91,000.00	On Leave
107		Mass, Christopher M.	MGR, TECH SVCS	\$116,200.00	Active
108		Hershberger, Pablo	MGR, TRNG & SVCS	\$140,000.00	Active
109		Hay, Robert M.	INSTRUCTOR I	\$170,800.00	Active
110				<b>\$1,096,900.00</b>	
111					
112					

8. Double-click the **06\_worksheet05.sas** program to open the file. The program creates an Excel workbook named **worksheet\_05.xlsx** in the **development > output** folder. The worksheet will contain a list table and a series of visualizations analyzing and displaying employees on leave.

- Run the program.
- Right-click the **worksheet\_05.xlsx** file and select **Download file**.
- Open the Excel file and view the results.

The Excel workbook will contain a single worksheet named **Employee Leave** with a list table and series of visualizations. Notice that the list table contains an auto filter and that the visualizations are displayed.

- Close the workbook.



## Step 2: Production

In the **production** folder, we will consolidate all the programs that we've developed and generate a single Excel workbook for stakeholders. Our objective is to create a single program capable of invoking each individual program and dynamically generating a comprehensive Excel workbook with all the necessary worksheets. The resulting Excel workbook is named based on the date of program execution and saved within the **production > output** folder.

1. In the workshop folder, navigate to the **production** folder. You'll find that it contains an **output** folder, a **programs** folder, and the program named **create\_excel\_workbook.sas**.
2. The **output** folder serves as the destination for the final Excel workbook.
3. Expand the **programs** folder. Here, you will find all the programs from development. Minor modifications have been made to the programs.
  - a. In the **00\_config.sas** program, paths have been adjusted to reference the **production** folder.
  - b. In the programs **02\_worksheet01.sas** through **06\_worksheet05.sas**, the statement for creating a new Excel workbook was removed from each program. In addition, the **SHEET\_INTERVAL=** option has been changed from **NONE** to **NOW** to create a new worksheet in the final workbook for each program.
4. Double-click the **create\_excel\_workbook.sas** program to open it. This program is designed to execute all the necessary programs to create the final Excel workbook.
  - a. Comments in the first part of the program provide an overview.
  - b. Under **REQUIREMENT: SPECIFY MAIN FOLDER PATH**, a macro variable is set to reference the main workshop folder.
  - c. Under **CONFIGURATION FILE SETTINGS**, the **%INCLUDE** statement executes the **00\_config.sas** program from the **programs** folder. This program sets all necessary macro variables and macro programs.
  - d. Under **PREPARE DATA**, the **%INCLUDE** statement executes the **01\_prepare\_data.sas** program from the **programs** folder. This program creates all the necessary tables for the Excel workbook.
  - e. Under **CREATE EXCEL WORKBOOK**, the code creates the final Excel workbook.
    - i. The **ODS \_ALL\_ CLOSE** statement closes all default SAS output destinations.
    - ii. The **ODS GRAPHICS** statement sets image output to **PNG**.
    - iii. The **ODS EXCEL FILE=** statement creates the final Excel file, using the **currMonthYear** macro variable to dynamically name the workbook by appending the current month and year to **\_HR\_REPORT\_FINAL.xlsx**. The **SHEET\_INTERVAL=** option is set to **NONE** to disable the automatic creation of new worksheets.
    - iv. A series of **%INCLUDE** statements execute the **02\_worksheet01.sas** to **06\_worksheet05.sas** programs, each creating a separate worksheet in the workbook.
    - v. The **ODS EXCEL CLOSE** statement closes the Excel output.
    - vi. The **ODS HTML** statement turns on the default HTML output.



- Run the **create\_excel\_workbook.sas** program and confirm that the program ran successfully.
- Expand the **production > output** folder. Locate the **2024M04\_HR\_REPORT\_FINAL.xlsx** workbook.
- Right-click the **2024M04\_HR\_REPORT\_FINAL.xlsx** file and select **Download file**. Open the workbook.
- Notice that the final workbook contains all five worksheets with analysis consolidated into a single workbook.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1	<b>HR Employee Data Overview - 2024M02</b>																						
2	Welcome to our HR Employee Data Analysis Workbook! This comprehensive Excel tool has been meticulously designed to streamline the process of analyzing and managing our human resources data effectively. This workbook serves as a user-friendly hub for organizing, interpreting, and gaining valuable insights from our employee data. With dedicated sheets for employee information, company headcount, division metrics, and more, you can effortlessly track and evaluate key HR indicators.																						
3																							
4	The workbook includes the following worksheets:																						
5	• Employee List - Information about each employee.																						
6	• Company Overview - Provides overall information about company headcount, location, active employees, total employees on leave, average years of service and total employees hired by year.																						
7	• Division Analysis - Provides salary, employee head count, and a list of each employee by division.																						
8	• Employee Leave - Provides information regarding employees on leave.																						
9																							
10	Maintained by Peter Styliadis in the Education department. Contact at 555-555-0000 or Peter@myemail.com.																						
11	Report created on Tuesday, February 20, 2024																						
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	A	B	C	D	E	F	G	H	I	J	K	L
1	<b>List of Employee Information</b>											
2												
3	Name	Employee Number	Division	Job Code	Job Title	Salary	Hire Dt	Years of Servi	Status	Employee Gender	Education Lev	Office
4	Lavelle, Alan A.	000477	CALIFORNIA REGIONAL	CAR002	ACCOUNT REP	\$38,500.00	12Nov2016	6 N	M		14 L.A.	
5	Cutter, Teresa R.	000460	CALIFORNIA REGIONAL	CAR001	ACCOUNT MANAGER	\$43,400.00	01Apr2013	9 N	F		16 L.A.	
6	Lawrence, Richard A.	000664	CALIFORNIA REGIONAL	CAR002	ACCOUNT REP	\$53,200.00	10Feb2015	7 N	M		16 L.A.	
7	Gruber, John R.	000950	CONTRACTS	CON008	FILE CLERK I	\$19,600.00	13Sep2015	7 N	M		15 Cary	
8	Lovette, Linda L.	000903	CONTRACTS	CON004	CONTRACTS ASST I	\$21,000.00	13Oct2023	-1 N	F		20 Cary	
9	Debra, Abra K.	000436	CONTRACTS	CON005	CONTRACTS ASST II	\$32,200.00	22Sep2019	3 N	M		15 Cary	
10	Frey, John H.	000576	CONTRACTS	CON010	LICENSING ANALYST	\$32,200.00	20Jan2020	2 N	M		15 Cary	
11	Randolph, Tom R.	000342	CONTRACTS	CON003	CONTRACTS ADMIN	\$33,600.00	20May2023	-1 N	M		16 Cary	
12	Day, Patrick E.	000066	CONTRACTS	CON007	CUSTOMER SVC ADMIN	\$35,000.00	31May2018	4 N	M		16 Cary	
13	Piqueras, Randall D.	000851	CONTRACTS	CON001	ASSOC CONT ADMIN	\$36,400.00	14Aug2012	10 N	M		15 Cary	
14	Atalla, Ahmed	000456	CONTRACTS	CON007	CUSTOMER SVC ADMIN	\$37,800.00	01Jan2017	6 N	F		19 Cary	
15	Salu, Mark B.	000386	CONTRACTS	CON007	CUSTOMER SVC ADMIN	\$37,800.00	04Jun2015	7 N	M		16 Cary	
16	Powers, Paul A.	000358	CONTRACTS	CON007	CUSTOMER SVC ADMIN	\$37,800.00	28Oct2022	0 N	M		16 Cary	
17	Orlando, Andre D.	000204	CONTRACTS	CON003	CONTRACTS ADMIN	\$37,800.00	21Mar2015	7 N	M		14 Cary	
18	Beekman, Roberta N.	000601	CONTRACTS	CON009	INTL LICENSING SPEC	\$40,600.00	24Jun2016	6 N	F		20 Cary	
19	Wheeler, David W.	000782	CONTRACTS	CON006	CUST ACCOUNT ADMIN	\$42,000.00	02Mar2017	5 N	F		16 Cary	
20	Tietjen, Grace N.	000485	CONTRACTS	CON002	ASSOC MKT COUNSEL	\$43,400.00	01Jan2013	10 N	F		19 Cary	
21	Bootton, Steven R.	000045	CONTRACTS	CON001	ASSOC CONT ADMIN	\$53,200.00	15Feb2011	11 N	M		16 Cary	
22	Mccoy, Theodora R.	000560	CONTRACTS	CON011	MARKETING COUNSEL	\$53,200.00	29Aug2012	10 N	F		17 Cary	
23	Spies, Scott I.	000185	CONTRACTS	CON001	ASSOC CONT ADMIN	\$58,800.00	15Dec2013	9 N	M		16 Cary	
24	Koyer, Herbert J.	000024	CONTRACTS	CON012	PARALEGAL	\$63,000.00	26Mar2012	10 N	M		15 Cary	
25	Williams, Munther V.	000047	CORPORATE COMMUNICATIONS	PUB002	ADMIN ASST II	\$37,800.00	22Sep2023	-1 N	M		14 Cary	
26	Sczesny, Dorothy E.	000829	CORPORATE COMMUNICATIONS	PUB007	ASSOC PROOFREADER	\$49,000.00	05Jun2014	8 N	F		16 Cary	
27												

