**Utilizing Tableau for Audit Data Analytics**

**Getting Started**

To download the free Student version of Tableau Desktop, follow these steps:

* Visit Tableau’s website for students: <https://www.tableau.com/academic/students>.
* Click on “Get Tableau for Free” and then fill out the requested information sheet to receive a free one-year license. For e-mail, use your official university-assigned e-mail address.
* You will receive an email with a product key for Tableau. The product key can be used to activate Tableau Desktop on two separate machines.
* From the email, select “Download Tableau Desktop here.” The downloading process may take some time depending on the speed of your internet connection.
* Open Tableau Desktop from where it was downloaded to your computer and follow the installation prompts from the pop-up window.
* Once installation is complete, open Tableau Desktop.
* When prompted and as instructed in the e-mail, choose to activate Tableau with a product key (**do NOT select a free 14-day trial; not all functions work in the trial version**). Copy and paste the product key from the email you previously received.
* Enter your name, organization, and email to complete registration.

**Chapter 1**

It is important to first learn the very basics of Tableau. As you spend time in the software, you will see it is very user friendly and becomes intuitive. Additionally, we encourage you to learn by trial and error! A powerful “undo” feature is especially helpful. To get started, complete the following tasks:

1. Access Tableau’s tutorial at: <http://onlinehelp.tableau.com/current/guides/get-started-tutorial/en-us/get-started-tutorial-home.html>. Read the backstory for the tutorial case about sales at a retail company. While the tutorial case study focuses on an employee using data analytics to find ways to improve revenue growth, the same principles and skills can be used in an audit setting to identify risk of material misstatement.
2. Carefully follow Tutorial Steps 1 through 6. Complete all tasks and expand all “Learn More” sections to maximize your learning. These steps will guide you through the basics of Tableau, all the way from connecting and loading data (Step 1) to creating your own dashboard of basic results (Step 6). This tutorial will take approximately **45-90** minutes to complete. **Please note two hints below and** **be sure to save your work as you go**.
   1. **Note**: In Step 5.4, be sure to select the bars when creating your filter, not the names of the states.
   2. **Note:** When creating the “Bottom 5” city filter in Step 5.5, it may not show any cities initially. That is ok: continue with the instructions regarding Order of Operations and the problem will be resolved.

Please note: if you need additional assistance or wish to learn more on your own, Tableau has an excellent set of free training videos at: <https://www.tableau.com/learn/training>.

**Chapter 2**

Open the Tableau tutorial file you saved after completing Chapter 1. Then, answer the following questions.

1. From an audit perspective, see if this company has any seasonality to sales.
   * Create a new worksheet (tab).
   * Add ‘Sales’ to rows and ‘Order Date’ to columns.
   * Expand ‘Year’ to quarters by pressing “+” in ‘Year’.
   * Press ‘Show Me’ and change from a discrete line chart to a continuous line chart.

**Which quarter has the highest sales in each year?**

1. Identify the major customers.
   * Add ‘Customer Name’ to rows and ‘Sales’ to columns.
   * Click on ‘Show Me’ and change the presentation to packed bubble chart.
   * Identify higher values by dragging ‘Sales’ onto the Color button.

**To which customer does the company sell the most product?**

1. Reperform #2 above, but instead of dragging ‘Sales’ onto the Color button, drag ‘Profit’ onto the Color button. Then, click on “Sort Descending” (the button is on the toolbar at the top of the screen, just under the “Window” menu) to order.

**Which customer is most profitable?**

1. Consider results from #2 and #3 above.

**What concerns might you have from an audit perspective?**

Please note: if you need additional assistance or wish to learn more on your own, Tableau has an excellent set of free training videos at: <https://www.tableau.com/learn/training>.

**Chapter 3**

No Tableau assignment for Chapter 3.

**Chapter 4**

The remaining Tableau assignments will use files related to a fictitious audit client called Roger Company. **You should start and save a new Tableau file for each Chapter.** Roger Company is a mid-size company that handles the distribution of various home and garden products. You are part of the engagement team assigned to audit Roger Company’s financial statements. This year, you are auditing financial statements from the calendar year 2021.

Roger Company’s files can be downloaded from Canvas in Excel format. Download the file, save it, then extract it to access the Excel files. Save in a place where you can find them later. For Chapter 4, you will import the Roger Company **shipping** file, which acts as its sales ledger. To import the file, open Tableau to create a new workbook, then connect to an Excel file. Browse and find the **shipping** file, then press Open. Click on Sheet 1 to begin your analysis.[[1]](#footnote-1) You have data on Roger Company’s sales for all of 2021 (the year under audit) and portions of 2020 and 2022. Sales have been intermittent, with some months having very few sales, while others have a high sales volume.

1. As a risk assessment procedure, plot a monthly revenue trend to get an overall feel for the sales trend for 2021 only.
   * Drag and drop Invoice Total to the Rows line.
   * Drag Invoice Date to the Columns line. This presents revenue by year.
   * Press the “+” sign next to YEAR in the Columns line, then press “+” next to QUARTER.
   * Remove YEAR and QUARTER from the Columns row. This now displays total sales (note the “SUM” next to Invoice Total in the Rows line) by month for the entire sample period.
   * To only include 2021’s data, drag Invoice Date to the Filter panel.
   * Double-click on Years, check 2021, and press OK.
   * Save tab as 2021 Revenue Trend.

**What three months had the highest sales in 2021?**

1. We need to first make some adjustments to certain variables in Tableau and better understand the difference between Dimensions and Measures. Dimensions (shown as blue variable names) are normally attributes about certain transactions that can’t be summed or otherwise quantified (e.g., dates, product numbers, invoice numbers, etc.). Measures (shown in green variable names), on the other hand, are normally the outcome variables we are most interested in (e.g., invoice total, quantity shipped, etc.). Sometimes, Tableau misclassifies these variables and we need to make changes before we can continue. In the **shipping** file, Tableau has classified Customer No. and Invoice No. as Measures instead of Dimensions. We need to set both of these as dimensions.
   * Right-click on Customer Number and press “Convert to Dimension.”
   * Repeat the previous step for Invoice Number.

**What other “number” has been imported as a Measure instead of a Dimension? Please change it to a Dimension using the instructions above.**

1. As a risk assessment procedure, let’s see what customers have large total sales volume.
   * Create a new worksheet (or tab).
   * Drag and drop Customer No. to the Columns line.
   * Drag and drop Invoice Total to the Rows line.
   * Tableau defaults to a bar chart. However, click on Show Me and change the presentation to Packed Bubbles.
   * Save worksheet as Total Sales by Customer.

**Which customer number has the largest total sales volume? To make things even clearer, drag and drop Invoice Total to the Color section of the Marks frame. Undo this color filter before continuing.**

1. Instead of *total* sales volume, examine *average* sales volume.
   * Right-click on the Total Sales by Customer tab, and duplicate. Rename this tab Average Sales by Customer.
   * Click on the dropdown arrow next to SUM(Invoice Total) in the Marks frame, then click on Measure, then Average.
   * In this case, the Bubbles Chart no longer provides a clear answer about which customer has the highest average sale amount. Instead, click on Show Me and change the presentation to Circle Views.

**Which customer number has the highest average invoice amount?**

Please note: if you need additional assistance or wish to learn more on your own, Tableau has an excellent set of free training videos at: <https://www.tableau.com/learn/training>.

**Chapter 5**

**You should start and save a new Tableau file for each Chapter.** Roger Company’s files can be downloaded from Canvas in Excel format. For Chapter 5, you will import the Roger Company **shipping** file. See Chapter 4 for instructions on how to import Excel files to Tableau.

1. In this question, we will use Tableau’s forecast function to forecast sales in 2021 Q4, and then compare forecasted sales to actual values as a final/review analytical procedure. Roger Company management has acknowledged that monthly sales are volatile.
   * After importing the **shipping** file, open a new worksheet (tab) and call it Q4 Forecast.
   * To perform a forecast, first right-click on Invoice Date and convert to a Continuous value.
   * Add Invoice Total to the Rows line, and Invoice Date to the Columns line.
   * Expand the invoice date until sales are shown by month.
   * Add Invoice Date from Dimensions to the Filter pane, select Range of Dates, and set the date filter to include all invoices through September 30, 2021.
   * To add the forecast, click on the ‘Analytics’ tab next to the ‘Data’ tab towards the top-left corner of Tableau.
   * Under Model, drag and drop Forecast on the line chart.
   * Left-click on the flat forecast line, and press Edit to change Forecast options.
   * We only want to forecast 2021 Q4, so change to forecast exactly three months, ignoring 0 months.
   * Change the Forecast Model from Automatic to Custom, and add in Additive trend. Click OK.

This now provides a forecast, based on 2020 and 2021 data, for sales in Q4 2021. If you put your mouse over the individual months, you will see the corresponding value.

* 1. **What are forecasted sales for October 2021?**
  2. **What are forecasted sales for November 2021?**
  3. **What are forecasted sales for December 2021?**

To obtain actual values, create a new worksheet (tab), add Invoice Total to the Rows line, and add Invoice Date to the Columns line, expanding until months are shown.

* 1. **What are actual sales for October 2021?**
  2. **What are actual sales for November 2021?**
  3. **What are actual sales for December 2021?**

1. Based on the sale amounts obtained in Question 1 above:
   1. **What month(s) significantly underperformed expectations?**
   2. **What month(s) significantly outperformed expectations?**

1. Based on your analysis in #1-2 above, please answer the following question:

**What inherent weaknesses does this forecast have?**

1. Based on this simple preliminary forecast:

**What audit evidence will the auditor need to obtain during the audit to become comfortable with revenue during Q4?**

Please note: if you need additional assistance or wish to learn more on your own, Tableau has an excellent set of free training videos at: <https://www.tableau.com/learn/training>.

**Chapter 6**

No Tableau assignment for Chapter 6.

**Chapter 7**

**You should start and save a new Tableau file for each Chapter.** Roger Company’s files can be downloaded from Canvas in Excel format. For Chapter 7, you will import the Roger Company **accounts receivable** file. This contains the AR balance as of the end of 2021. See Chapter 4 for instructions on how to import Excel files to Tableau. In this question, we will use Tableau to highlight potential breakdowns in internal controls.

1. Roger Company’s internal controls require that the same employee not act in more than one of the following roles: AR clerk, Cash Receipts Clerk, and GL Accounting clerk. To identify sales for which these segregation of duties controls were not followed:
   * Add Invoice Total to the Rows line.
   * Add AR Clerk, Cash Receipts Clerk, and GL Accounting to the Columns line.
   * Save worksheet (tab) as Segregation of Duties.

In this bar chart, the initials along the top row identify the AR clerk, the next line identifies the Cash Receipts clerk, and the row along the bottom of the bar chart identifies the GL accounting clerk. From this, we learn that the employees with initials HMK and NCS act as AR clerks; that employees FKL, HMK, MB, and SG act as cash receipt clerks; and CT, HMK, and MB act as GL accounting clerks. That one person fulfills multiple roles at some point is acceptable, but controls prohibit the same person fulfilling multiple roles *on the same transaction*.

The resulting bar chart shows that when HMK is the AR Clerk and FKL is the Cash Receipts Clerk, CT is the GL Accounting Clerk for $229,492 of current AR balances. However, there are $22,711 of current AR for which HMK acted as both AR Clerk and GL Accounting clerk. This shows that employee HMK occasionally acts in multiple roles on the same transaction.

* 1. **What is the total dollar value of accounts receivable for which HMK acted as both AR clerk and Cash Receipts Clerk?**
  2. **When SG is the Cash Receipts clerk, what is the total dollar value of accounts receivable for which HMK acted as both AR Clerk and GL Accounting clerk?**

1. Roger Company also requires all sales to be authorized.

**Using the transactions in the accounts receivable file, identify the total dollar volume of AR that was *not* approved (hint, use the Filter pane). Save your worksheet (tab) as Not Approved AR.**

1. Problems 1 and 2 above identified instances of ineffective operation of key controls in the revenue cycle.

**How would these identified control deficiencies affect the nature, timing, and extent of substantive procedures for the revenue cycle?**

1. Based on results from Problems 1 and 2 above:

**What role does materiality play in classifying the type of control deficiencies identified in Problems 1 and 2 above?**

1. Revenue is recognized when shipped. Based on shipping dates in the **shipping** file, total revenue for 2021 is $1,378,895. The audit team has set overall materiality at 1% of revenue.

**Would you classify the authorization control deficiency identified in Problem 2 above as a control deficiency, a significant deficiency, or a material weakness?**

Please note: if you need additional assistance or wish to learn more on your own, Tableau has an excellent set of free training videos at: <https://www.tableau.com/learn/training>.

**Chapters 8 and 9**

No Tableau assignment for Chapters 8 or 9.

**Chapter 10**

**You should start and save a new Tableau file for each Chapter.** Roger Company’s files can be downloaded from Canvas in Excel format. For Chapter 10, you will use several Roger Company files. See Chapter 4 if you need additional instruction on how to load Excel files into Tableau.

1. To identify invoices that exceed the credit limit, first open a new Tableau workbook, connect to the **accounts receivable** file, and name the first worksheet (tab) in the workbook Exceed Credit Limit.
   * To identify invoices that exceed a customer’s pre-approved credit limit, we will create a new measure called *Difference*. Right click beneath the measures in the Tables section (the green variables) and click on Create Calculated Field.
   * In the popup window, change the variable name from Calculation1 to Difference.
   * In the white space, type this formula: [Invoice Total]-[Credit Limit] and click OK. This will create our new variable that identifies yet-uncollected sales invoices that exceeded the credit limit.
   * Add Difference to the Rows line.
   * Right-click on Invoice No and convert it to a Dimension.
   * Add Invoice Number to the Columns line, and then sort in descending order of magnitude (click on sort icon  at the top of the toolbar).
   * Take a minute and think about what the negative values represent (hint, look back at the formula used to create the Difference measure)? Because of how we have calculated the measure, negative values are invoices that are *less* than the credit limit.
   * Now, add a filter on Difference to **remove** invoices with negative values (hint: set the minimum to 0).

**How many invoices exceed the credit limit?**

1. Duplicate the tab Exceed Credit Limit and add a filter to only show those invoices that exceeded credit limits *and* were NOT authorized (Hint: use the variable Authorized as a filter). Save this worksheet (tab) as Exceed Not Authorized, and save your workbook as ***Chapter 10a***.

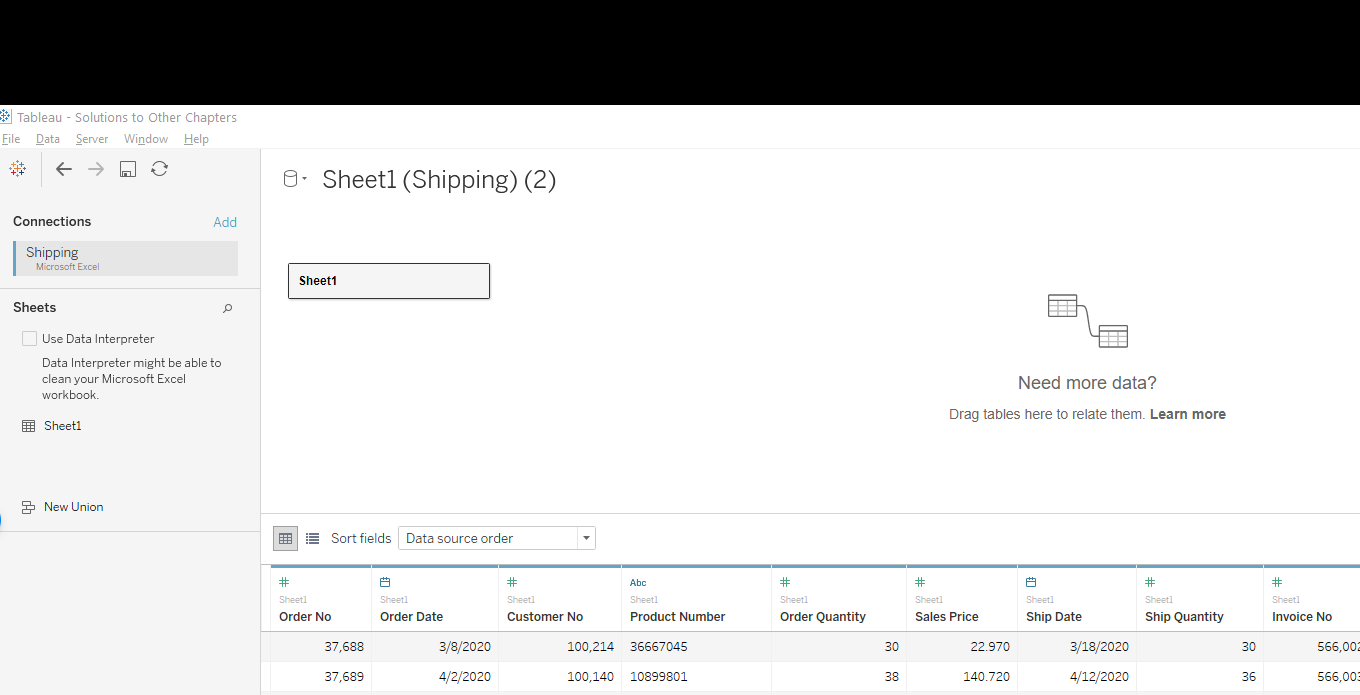
**How many invoices both exceeded the credit limit and were NOT approved?**

1. We will now identify shipments that exceeded the ordered amount. Close Tableau, then re-open and create a **new** workbook called ***Chapter 10b*** (alternatively, you can create a new worksheet, click Data in the top menu bar, then New Data Source, then find the shipping file).
   * Connect to the **shipping** file and name the first worksheet (tab) Shipped Not Ordered.
   * Create a new calculated field called “Excess Shipment,” calculated as Ship Quantity minus Order Quantity.
2. **How many invoices had shipment quantities that exceeded the amount ordered (Hint: add Excess Shipment as a row and Invoice Number as a column, then add a range filter on Excess Shipment to only identify the invoices you are interested in)?**
3. **What audit consequences does this result have?**

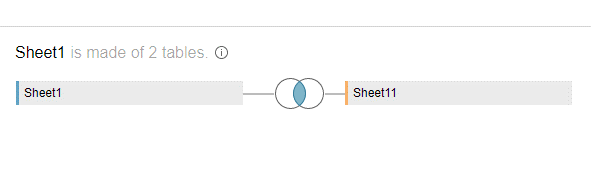
1. Duplicate the worksheet (tab) Shipped Not Ordered and name it Ordered Not Shipped. Save your workbook Chapter 10b.

**How many invoices were only partially shipped? (hint: continue to use the measure Excess Shipment but change the filter to have no minimum but a max of -1).**

1. Please note: **This is a challenging question**. You noticed that sales are not evenly spread across the year and are curious about which products sell during different times of year. While the **shipping** tab has all sales and lists the Product Number, it contains no description of the inventory; that information is on the **inventory** file. So, you must combine (or merge) the two files to obtain the information you seek.
   * Close Tableau, then re-open and save the workbook as ***Chapter 10c***.
   * Connect to the Roger Company **shipping** file and name the first worksheet (tab) Inventory Seasonality.
   * Now, click on Data Source in the bottom left-hand corner. In the pane in the **middle** of the screen, there is a box/icon that says “Sheet1” (see screenshot below).



* + Double click on that Sheet1 icon, after which the middle pane should say Sheet1 is made of 1 table.
  + Click on “Add” towards the top left corner, then Microsoft Excel, then find the **inventory** excel spreadsheet. After adding the inventory file, the two files should merge as indicated by this icon:



* + Now that you have a merged dataset, click on the worksheet tab and ensure that Invoice Date is discrete (you can check by right-clicking on Invoice Date; if it gives you the option of converting to continuous, it means it is already discrete).
  + Then, add Invoice Date to the Columns line and expand it until months are shown.
  + Now, add Description to the Rows line.
  + Now, add Ship Quantity to the Text icon in the Marks frame.
  + At this point, you see the total quantity sold of each inventory description, by month, for the entire dataset. You are especially curious about the month of November, 2021. Filter to only show sales in 2021 (based on shipping date).
  + Then, sort November 2021 in descending order by hovering over the November 2021 Column and pressing the sort button.

**What product sold the most units in November? Does that make sense given the nature of yard work that happens in November?**

Please note: if you need additional assistance or wish to learn more on your own, Tableau has an excellent set of free training videos at: <https://www.tableau.com/learn/training>.

**Chapter 11**

**You should start and save a new Tableau file for each Chapter’s assignment.** Roger Company’s files can be downloaded from Canvas in Excel format. For Chapter 11, you will import the Roger Company **accounts payable** file. See Chapter 4 for instructions on how to import Excel files to Tableau.

1. Using the **accounts payable** file, name the first worksheet (tab) Vendor Balance.
   * Add Invoice Amount and Vendor number to the plot, then sort in descending order.

**What vendor number has the largest AP balance?**

1. Using your Vendor Balance analysis, click on Show Me to see how different formats can also provide clear takeaways. For example, click on the “treemap” format option.

**What color is vendor 10348400 and what does that mean (Hint: to see the treemap legend you may need to hide Show Me drop down screen)?**

1. Using your Vendor Balance analysis:

**Try at least one more format in the Show Me tab and say which format you prefer the most.**

1. Start a new worksheet (tab) and name it Vendor Map.
   * You’ll notice that this automatically connects to the **accounts payable** data (look in the top-left corner). However, we need to connect to the Roger Company **vendor** file for this new tab. To do so, once you are in the new Vendor Map tab, click on Data in the menu bar at the top of the screen, click on New Data Source, and find the **vendors** file you wish to reference. You will now have imported the vendors file. Click on the Vendor Map tab to continue. You should see the **vendors** data source highlighted for your new tab.
   * Double click on ZIP (Zip Code).

**According to the map, in which state does Roger Company have the most vendors?**

Please note: if you need additional assistance or wish to learn more on your own, Tableau has an excellent set of free training videos at: <https://www.tableau.com/learn/training>.

**Chapter 12**

**You should start and save a new Tableau file for each Chapter’s assignment.** Chapter 12’s Tableau assignment relates to the P-Card Case developed by the Ernst and Young Foundation. This case uses publicly available data from the State of Oklahoma to examine questionable purchase card transactions. The full case assignment is available on request and provides you the opportunity to explore the audit data analytics process in great depth using Microsoft Access. We encourage you to explore the full case as time allows. For purposes of this text, we have modified the case to focus on a single fiscal year, 2015, in which you will play the role of an internal auditor for Oklahoma State University. Your task is to examine the use of P-cards (purchasing cards) for questionable expenditures that violate HR policy. P-cards are often a significant expense and are often not well-controlled, leading to a heightened risk of fraud and employee abuse. We adapt parts of Tasks 4, 5, and 6 of the complete P-Card case as follows:

1. Identify purchases that exceed the policy maximum of $5,000.
   * Download the 2015 P-Card File from Canvas and load it into Tableau (note—it is a CSV file, not an Excel file, so **import it as a text file**, otherwise you will not import all transactions). When the data are imported, you will see a pop-up window in the data window. Press Update Now to bring in all values.
   * Rename Sheet 1 to Purchases Over 5k.
   * Convert Transaction# to a Dimension.
   * Add Amount to the Rows line and Transaction# to the Column line.
   * Create a filter on Amount to only those transactions greater than $5000.
   * Then, create a filter on Agency Name to only include transactions related to Oklahoma State University.
   * Sort descending to identify the transaction with the highest dollar value.
   * You can easily drill down into this transaction by right-clicking on the bar and selecting View Data, and then Full Data along the bottom of the pop-up window.

**What is the general description of this transaction (e.g., vendor)?**

1. Duplicate worksheet (tab) Purchases Over 5k and rename the new worksheet (tab) as Prohibited Purchases.
   * Remove the Amount filter. Instead, add a filter on Description.
   * In the filter pop-up window, click on the Wildcard tab for text filters. Identify purchases that are prohibited by policy (e.g., gasoline, alcohol, weapons, gifts or gift cards, insurance, mail or postage, etc.). Be careful of false positives (e.g., a search for “alcohol” will identify legitimate purchases of ethyl alcohol. Search terms such as wine, gasoline, and gift are more specific).
2. **How many transactions include “gasoline” in the underlying transaction data?**
3. **How many transactions include “weapons” in the underlying transaction data?**
4. **Based on your review of these transactions, do you believe these purchases violated policy?**
5. The procedure in Question 2 above, in which some false positives are identified, suggests that audit data analytics require frequent refinement and often identify items that are readily explained.

**Discuss the implications for how audit data analytic techniques are used in the audit process. You may wish to review material in Appendix B, Figure B-2, when answering this question about the iterative nature of audit data analytics.**

Please note: if you need additional assistance or wish to learn more on your own, Tableau has an excellent set of free training videos at: <https://www.tableau.com/learn/training>.

**Chapter 13**

**You should start and save a new Tableau file for each Chapter’s assignment.** Roger Company’s files can be downloaded from Canvas in Excel format. For Chapter 13, you will import the Roger Company **inventory** file. See Chapter 4 for instructions on how to import Excel files to Tableau.

1. Create a calculated field called Margin (equal to Sales Price minus Unit Cost). Examine the data for inventory items (product numbers) with high profit margins.

**What 3 product numbers have the highest profit margins?**

1. Auditors are also concerned about identifying inventory that potentially needs to be written down to its current value.

**How many products have negative profit margin? (hint: use the Filter)**

Please note: if you need additional assistance or wish to learn more on your own, Tableau has an excellent set of free training videos at: <https://www.tableau.com/learn/training>.

**Chapter 14**

You will not use Tableau for this assignment. Instead, read these articles on the use of data analytics in the audit context:

* <https://www.cpajournal.com/2019/06/19/machine-learning-in-auditing/>
* <https://pcaobus.org/oversight/standards/research-standard-setting-projects/changes-use-data-technology-conduct-audits>

Part of this discussion relates to using data analytics to scan contracts (i.e., complex loan agreements as discussed in Chapter 14) and search them for unusual agreements or terms. After reading the article, please answer the following questions:

1. **To what extent will auditors still perform “traditional” substantive testing in light of the increasing use of audit data analytics? In other words, will audit data analytics replace all traditional auditing techniques, or complement them?**

1. **How do audit regulators view these changes in audit technology?**

**Chapter 15**

Chapter 15’s Tableau assignment comes from a portion of the Peach State University Hotel Case developed by the Ernst and Young Foundation. The entire case assignment is available on Canvas and provides you the opportunity to explore the audit data analytics process in great depth using Tableau. We encourage you to explore the full case as time allows. For purposes of this assignment, we include only some of the case requirements and give full attribution for this material to the EY Foundation. Your task is to use EY’s proprietary Tableau analyzer tool, called EY Helix, to perform income statement analyses of a fictitious client.

1. Download the EY Helix Tableau workbook to your computer from Canvas. Also available for download is an EY Helix User Guide should you need additional assistance.

1. Locate the workbook file you saved and double-click on the file to open it. You may need to accept any SQL warnings/prompts depending on your computer. After opening the EY Helix Tableau workbook, perform the following Income Statement Analyses using EY Helix. For many, you will need to find the relevant account on the income statement and then find the details on the lead sheet for that line item.
   1. What was the percentage increase in main travel expenses (excluding both mileage and non-employee travel)?
   2. Did total revenue increase or decrease from the previous year and by how much?
   3. How much did the company pay for any overtime expenses in the current year (excluding interns)?

1. Perform the following Monthly Activity Analyses using EY Helix. Do not be afraid to click around the tool and try to find information—that’s what it’s there for!
   1. For which month is there the largest difference in net revenue (all revenue accounts) between FY15 and FY16? Hint: change the accounts in the dropdown menu in the upper left-hand corner to just be revenue accounts.
   2. In FY16, which month has the highest revenue (all revenue accounts)? Keep in mind that increases to revenue accounts are credits in the accounting entry (e.g., debit AR and credit revenue). Credits in this spreadsheet are represented by *negative* numbers.
   3. In FY16, which month has the lowest revenue (all revenue accounts)?
   4. Where did you find the answer to the previous questions?
2. EY Helix has a powerful drilldown analysis called Dimension analysis, which allows users to disaggregate account-level data by various characteristics of transactions. Use the Dimension analysis tool to display the revenue related to dining and hotel sales for FY16 by source (e.g., cash, credit card, check). What is the total cash receipts amount related to dining sales for FY16?

Please note: if you need additional assistance or wish to learn more on your own, Tableau has an excellent set of free training videos at: <https://www.tableau.com/learn/training>.

**Chapter 16**

**You should start and save a new Tableau file for each Chapter’s assignment.** Roger Company’s files can be downloaded from Canvas in Excel format. For Chapter 16, you will use the Roger Company **cash disbursements** file. See Chapter 4 for instructions on how to import Excel files to Tableau.

1. First, create a new worksheet (tab) called CD by Payee.
   * Add Amount Paid and Payee to the grid.
   * Using the Show Me feature, view the data in a box-and-whiskers plot.

**Which payee has been paid the most? How might this type of visualization be useful in other settings?**

1. Create a new worksheet (tab) called CD by Week.
   * Add Amount Paid and Date Paid to the plot.
   * Expand Date Paid until Days are shown, then remove Years, Quarters, and Month from the plot.

**Company policy is to pay only on the 15th or the 30th of the month. What total dollar amount is paid off-cycle?**

1. Regarding the off-cycle payments from #2, drill down and identify who was paid with those payments. You can easily drill down by clicking on the part of the line that corresponds to amounts paid on the 5th of the month (used to report the total in #2 above) and then click on View Data, then Full Data.

**In conjunction with Questions #1 and #2 above, does this raise any concerns from an audit or fraud risk perspective?**

Please note: if you need additional assistance or wish to learn more on your own, Tableau has an excellent set of free training videos at: <https://www.tableau.com/learn/training>.

**Chapter 17**

Final/review analytical procedures are a key part of wrapping up the audit. Often times, the procedures involve reperforming risk assessment procedures done during planning and making sure that sufficient audit evidence was obtained to explain any notable differences. Please complete the following questions.

1. In Chapter 4, you were asked to identify customers with large total sales volume. One large customer was identified as having an unusually large balance.

**What substantive procedures should have been completed during the audit to provide evidence that the revenue related to this one customer was fairly stated?**

1. In Chapter 5, you forecasted Q4 sales and then compared them to actual sales. This suggested that some months had higher sales than expected.

**What substantive procedures should have been completed during the audit to provide evidence that revenue during Q4 was not overstated?**

1. Final/review analytics provide the auditor with a chance to take one last, big-picture view of the audited entity’s financial statements.

**What purpose does this serve, and how can it be different than detailed substantive testing?**

**Appendix B**

This case has you do a deeper analysis of the valuation and allocation assertion for Inventory.

* Open the Tableau packaged workbook called “Inventory Case”
* Click on Sheet 1 and call it Visualization 1.
* Calculate a new variable called Margin
  + Right click underneath the measures (the green variables in the Tables pane) and select Create Calculated Field
  + Name the field ‘Margin’
  + The equation should be ([Sales Price1 from the **Shipping** section *minus* Unit Cost from the **Inventory** section])\*Ship Quantity from the **Shipping** section. Press OK.
    - Hint: make sure you include the parentheses around the price minus cost expression, otherwise your margin will be incorrectly calculated and incorrectly summed later on!
* Drag “Product Number1” from the **Shipping** portion into the Columns field.
* Drag “Ship Quantity” from the **Shipping** portion into the Rows field.
* Click on Show Me and change the view to Packed Bubbles.
* Drag and drop “Margin” onto the “Color” section of the “Marks” tab.

You have now created a visualization that captures both the total volume of sales and the total margin for each product. Based on Visualization 1, please answer the following questions.

1. Create a duplicate of the Visualization 1 tab and name the new tab Visualization 2. Move the “Margin” variable into the Filter pane. Using the filter option, how many products sold at below cost?
2. Do any of those products raise particular concerns?
3. What implications does the information you’ve learned through this visualization have for the audit of inventory on hand at year-end?
4. What management assertion(s) does this information relate to?
5. Think of and perform **two** additional visualizations using this inventory and shipping data that would provide insights into risks of material misstatement for the inventory account. Combine these visualizations with others required above into a Dashboard.
6. In questions 1-4 above, you completed a simple audit data analytic. Based on what you performed, document how you would plan, perform, and evaluate your analytic **following the explicit 5 steps of the AICPA’s Guide described in Appendix B**, all the way from planning the analytic to evaluating the results and their effects on the rest of the audit plan. In applying these steps, you will need to document tasks that you didn’t actually do in questions 1-4 above; that’s ok, simply document those tasks how you *would* have done them if you had access to everything you would on a real audit.

1. If you are already working in a Tableau file with imported data and need to look at a new data source, click on Data at the top of the screen, click on New Data Source, and find the file you wish to reference for that Sheet. [↑](#footnote-ref-1)