



RUTGERS



Introduction to Tableau Report Development

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WHAT IS TABLEAU?

- A reporting and data visualization tool that will be replacing Discoverer as Rutgers' primary reporting front-end for the Financial data warehouse.

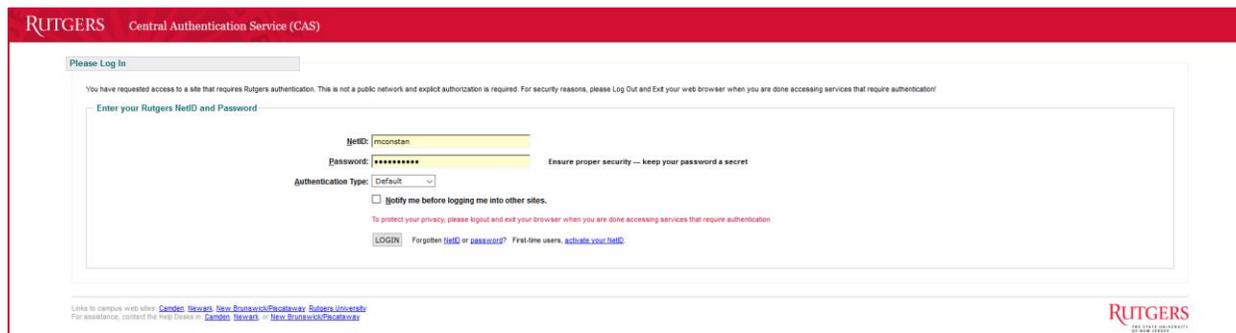
Tableau provides:

- The ability to create reports and visualizations using data from the various systems in use at Rutgers
- An intuitive drag-and-drop interface
- The ability to create advanced analytics that go beyond column-row reports

LOGGING IN

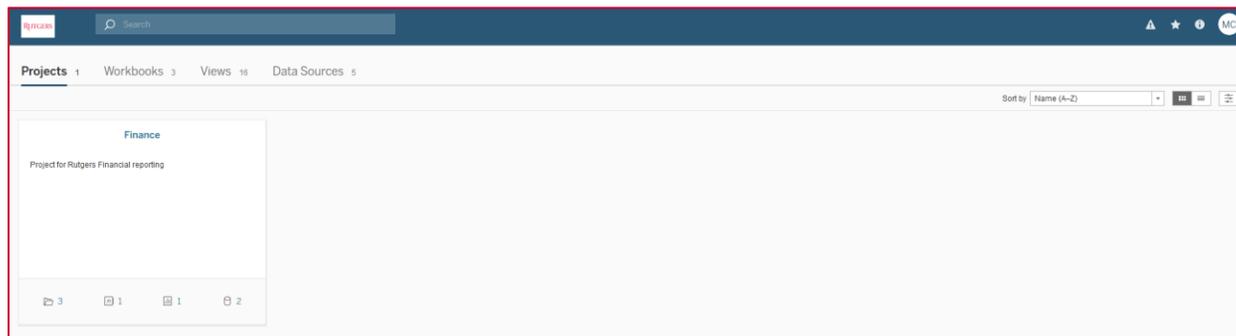
Use your web browser to navigate to the Tableau Enterprise server: <https://bireporting.rutgers.edu>.

Once there, you will be prompted to login using your Rutgers single-sign-on.

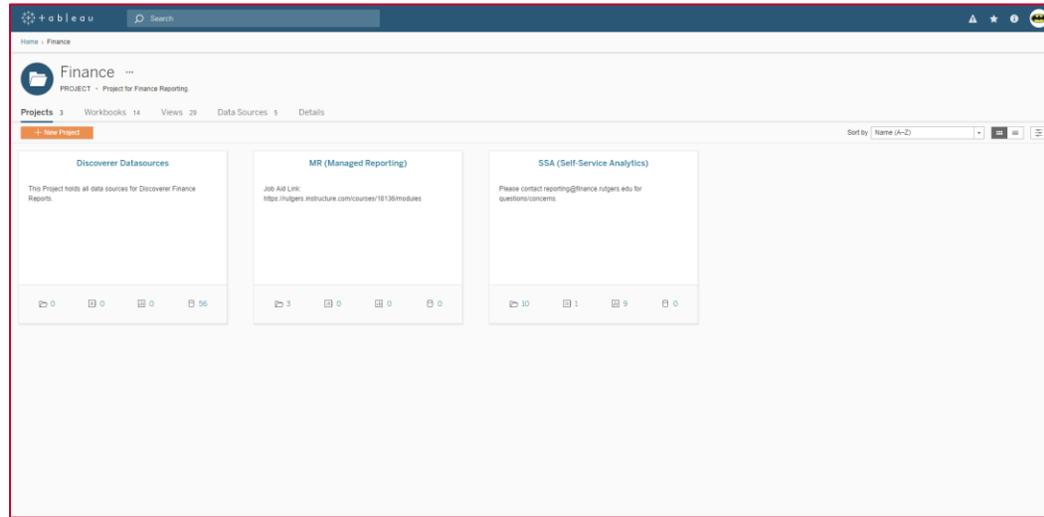


The screenshot shows the Rutgers Central Authentication Service (CAS) login page. The page has a red header with the Rutgers logo and the text "RUTGERS Central Authentication Service (CAS)". Below the header, there is a "Please Log In" section. A message states: "You have requested access to a site that requires Rutgers authentication. This is not a public network and explicit authorization is required. For security reasons, please Log Out and Exit your web browser when you are done accessing services that require authentication!". The main form is titled "Enter your Rutgers NetID and Password:". It contains fields for "NetID:" (with the value "jmonstan" entered), "Password:" (with masked characters "*****" and a note "Ensure proper security — keep your password a secret"), and "Authentication Type:" (set to "Default"). There is a checkbox for "Notify me before logging me into other sites." and a "LOGIN" button. Below the button, there are links for "Forgot NetID or Password?" and "First-time users, activate your NetID". At the bottom, there are links to campus web sites and assistance contact information, along with the Rutgers logo.

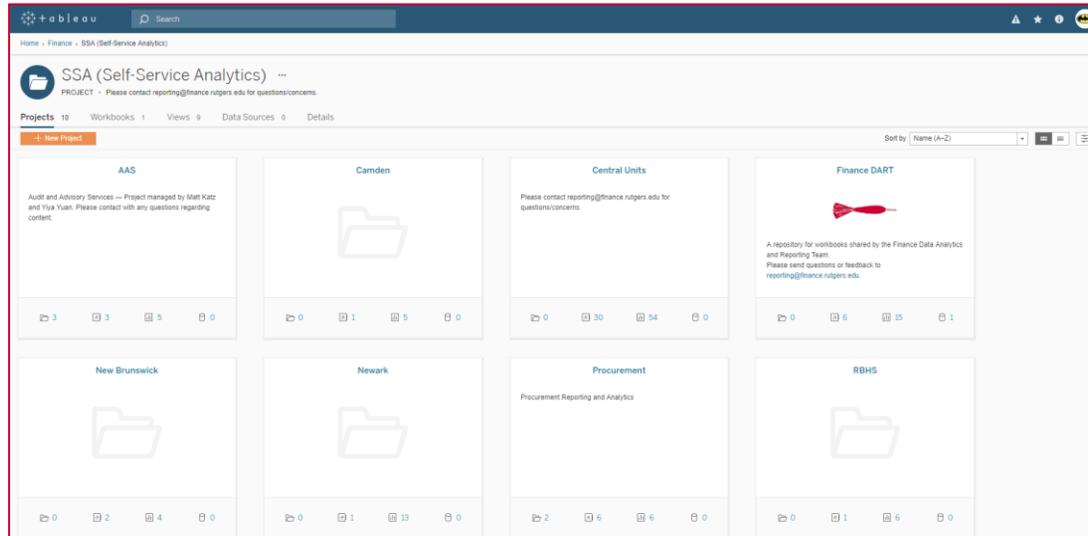
You will now be at the **Projects** screen. The projects visible to you will vary based on your permissions.



Within the **Finance** project, there are multiple sub-projects. **MR (Managed Reporting)** is the repository for validated reports, including the Discoverer replacements. **SSA (Self-Service Analytics)** is where users permitted to do so can save their own workbooks or access the workbooks others have created.

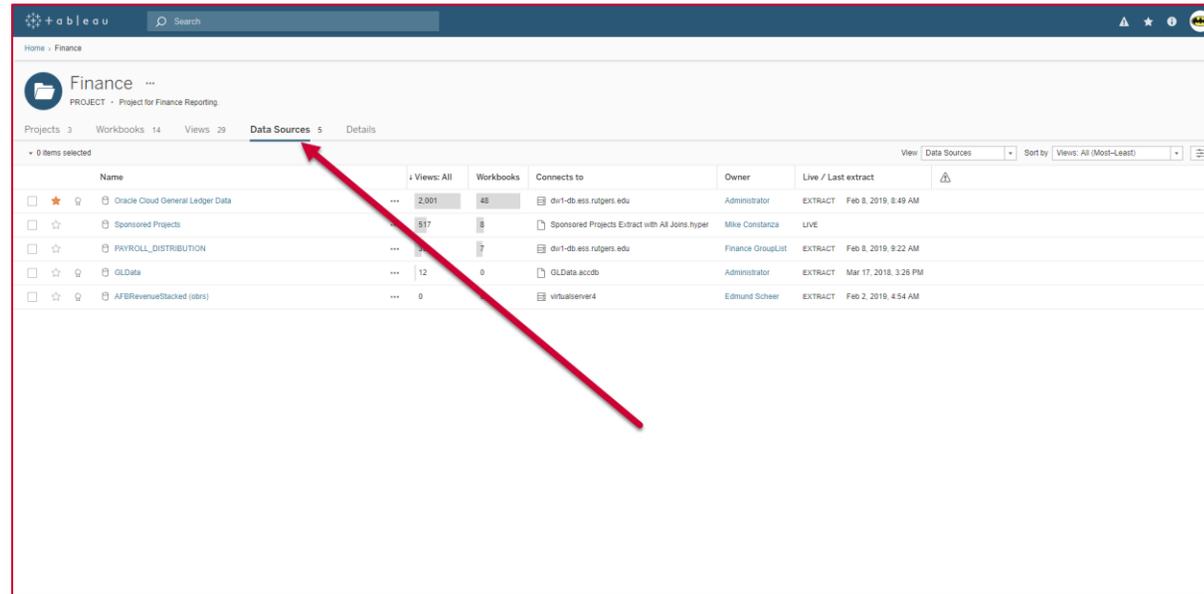


In the **SSA** project, there are sub-projects for each of the campuses and other units. You will only see those you have permission to access. Generally, you will save your workbooks in your designated project folder.



CREATING A NEW WORKBOOK

1. Navigate to the project folder that contains the data source. Most are contained in the **Finance** project, but others can be posted within other projects in the SSA environment.
2. Click the **Data Sources** tab.



3. Click on the desired data source.
4. Click the  icon.
5. You will now have a blank workbook to work with connected to the data source.

SAVING YOUR WORKBOOK

1. Click File and select **Save As**.
2. Enter a name for your workbook.
3. Select your designated project folder and click **Save**.

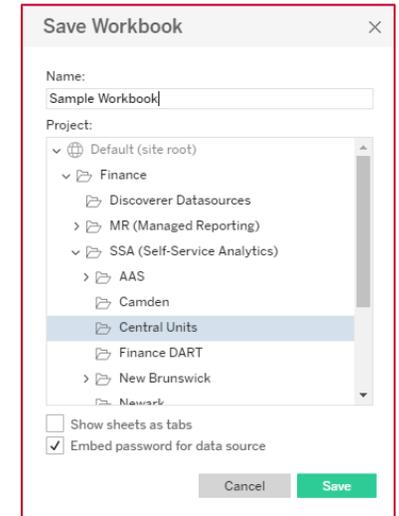
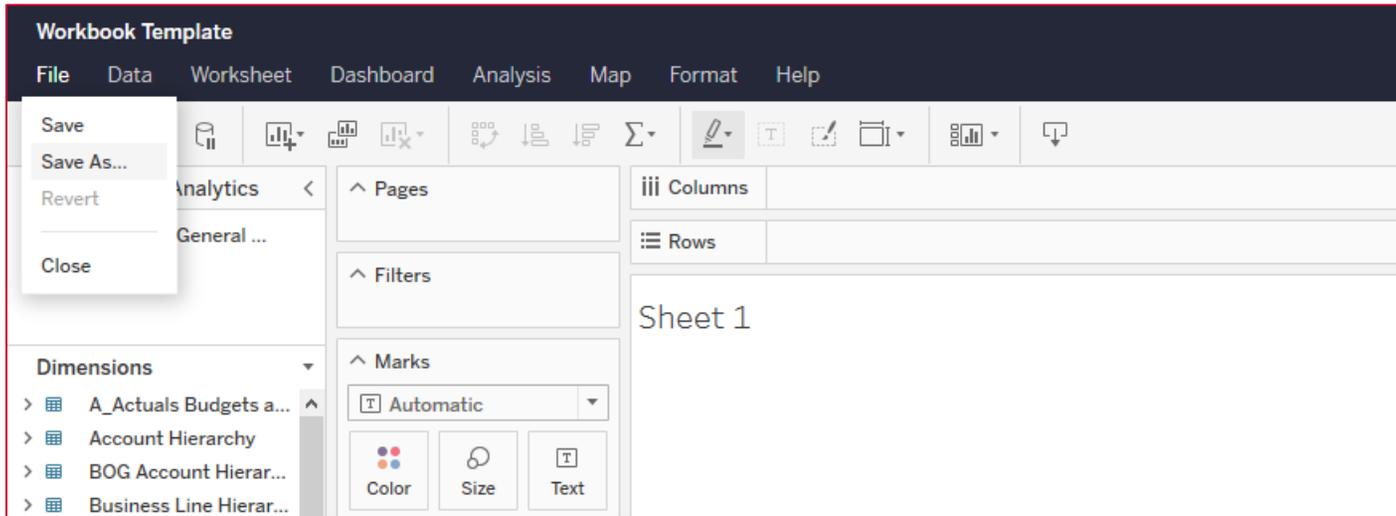
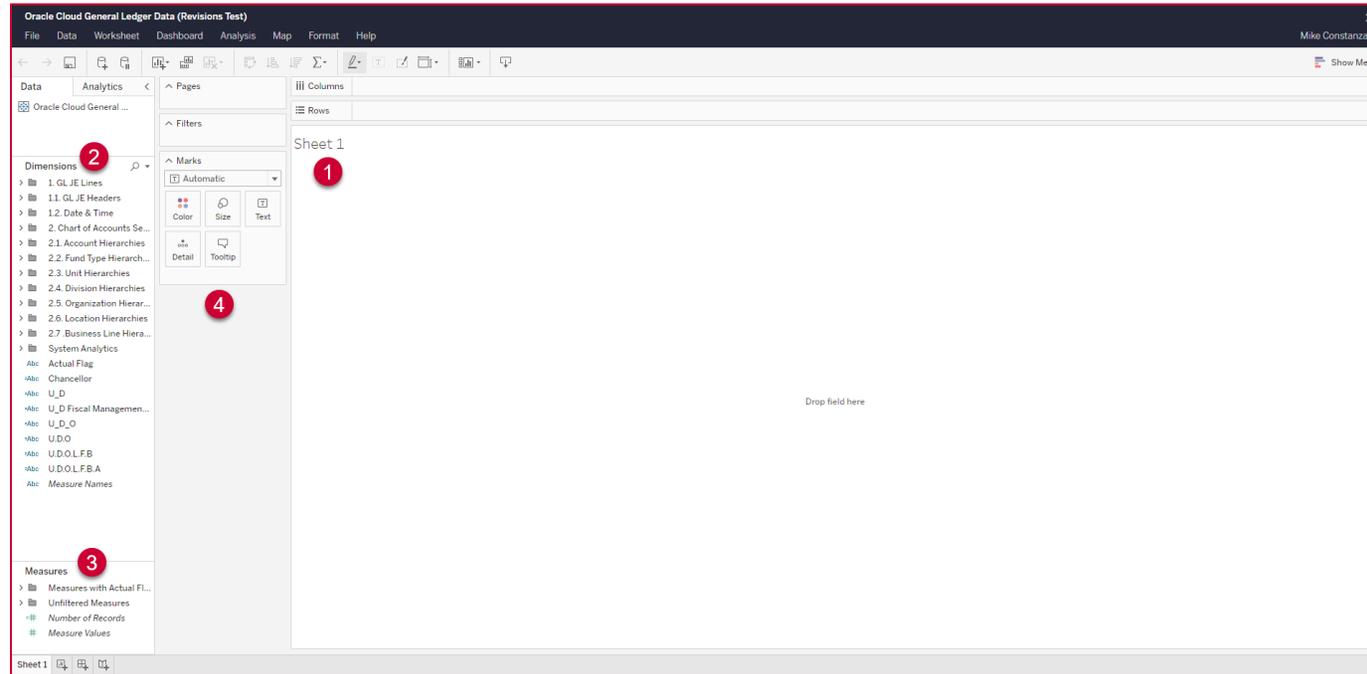


TABLEAU BASICS



1. **Workspace** – This is where you drag and drop **Dimensions** and **Measures** to create your workbook.
2. **Dimensions** – Column attributes or fields. These can be dragged to the **Workspace**, **Pages**, **Filters**, or **Marks** sections.
3. **Measures** – values to be aggregated in an analysis. These can be dragged to the **Workspace**, **Pages**, **Filters**, or **Marks** sections.
4. **Pages, Filters, and Marks** – Dragging dimensions or measures to these sections creates various ways of displaying and parsing your data.

Data	Analytics <	HIGHLIGHTS
 Oracle Cloud General ...		
Dimensions 		
<ul style="list-style-type: none"> >  1. GL JE Lines >  1.1. GL JE Headers >  1.2. Date & Time >  2. Chart of Accounts Se... >  2.1. Account Hierarchies >  2.2. Fund Type Hierarch... >  2.3. Unit Hierarchies >  2.4. Division Hierarchies >  2.5. Organization Hierar... >  2.6. Location Hierarchies >  2.7 .Business Line Hiera... >  System Analytics <i>Abc</i> Actual Flag =-Abc Chancellor =-Abc U_D =-Abc U_D Fiscal Managemen... =-Abc U_D_O =-Abc U.D.O =-Abc U.D.O.L.F.B =-Abc U.D.O.L.F.B.A <i>Abc</i> Measure Names 		<ul style="list-style-type: none"> - GL JE Lines contains supporting information for GL journal entry lines, including line number, description, and update dates - GL JE Headers contains supporting information for GL journal entry headers, including source, category, and batch. - Date & Time contains various dates associated with journal transactions, including accounting date, accounting period, posted date, and fiscal year. - Chart of Accounts Segments contains the account segments for GL Journal transactions in a Tableau hierarchy. - Hierarchies contain the codes and descriptions for the various segments and their roll-ups. These are used to organize your analysis by general ledger account segments. - Dimensions preceded by a = are calculated dimensions. They were manually created by combining other dimensions, such as U.D.O, which combines the Unit, Division, and Organization dimensions into one field.

Measures	HIGHLIGHTS
# Accounted Cr	
# Accounted Dr	
# Accounted Net Amt	
-# Actual	<ul style="list-style-type: none"> - Users should begin with the measures in the Measures with Actual Flag folder.
-# Amount	<ul style="list-style-type: none"> - Accounted Cr, Accounted Dr, and Accounted Net Amt are values associated with journal transactions and come directly from the database.
-# Budget	
# Entered Cr	
# Entered Dr	
-# Forecast	<ul style="list-style-type: none"> - Actual, Budget, Encumbrance, and the Forecast measures are calculated measures that incorporate the necessary filters to display only Actual or Budget values for the Accounted Net Amt. Most users should begin with these measures.
# Invoice Amount	
# Net Amt	
# Stat Amount	
# Subledger Doc Sequen...	<ul style="list-style-type: none"> - Variance Variance B to A and Variance B to F are calculated measures that calculate the difference between Budget & Actual and Budget & Forecast measures.
-# Variance	
-# Variance B to F	
-# <i>Number of Records</i>	
# <i>Measure Values</i>	

Tableau interface showing a dashboard titled "Expenses - Budget v Actual".

Summary by UDO

Unit Code	Division Code	Organization Code	Budget	Actual	Variance B to A
Grand Total			4,464,191,412	4,966,858,447	-502,667,034
100	1510	3103			
		9999	-1,663,496	-1,922,764	259,268
	3500	1080		-400,378	400,378
		2935	5,357,747	0	0
		3894	177,410	4,981,076	376,671
		6330	56,496	240,125	-62,715
		6428	1,327,884	55,350	1,146
		8311		1,460,877	-132,992
		3327	173,175	0	0
	3510	3327	173,175	-29,973	203,148
	3520	7373	346,336	193,278	153,058
	3600	1066	84,708	202,248	-117,540
		2032	0	-70,771	70,771
		4671	91,814	76,079	15,735

Expenses by Account Level 3 - Pie Chart

GP TRAVEL & BUSINESS EXPENSE
 GP EXPENDED FOR PLANT FACILITIES
 GP FRINGE BENEFITS
 GP INTEREST ON CAPITAL RELATED TO DEBT
 GP OPEB EXPENSES
 GP OTHER OPERATING EXPENSE
 GP REPAIRS & MAINTENANCE
 GP SCHOLARSHIPS & FELLOWSHIPS
 GP SALARY & WAGES

Summary by Expenditure Type

Account Code	Account Descr	Budget	Actual	Variance B to A
Grand Total		4,464,191,412	4,966,858,447	-502,667,034
50010	S&W Staff PAYROLL DEPT USE O...	962,400,812	919,283,617	43,117,195
50020	S&W Tenured Faculty PAYROLL D...	322,239,489	327,717,641	-5,478,152
50030	S&W Tenure Track Faculty PAYR...	51,723,467	53,030,732	-1,307,265
50040	S&W NonTenured Faculty PAYRO...	346,460,096	351,153,494	-4,693,398
50050	S&W TA & GA PAYROLL DEPT USE...	43,624,609	46,955,411	-3,330,802
50060	S&W Post Doctorate & Associate...	25,884,338	25,947,028	-62,690
50070	S&W Housestaff PAYROLL DEPT...	68,098,830	67,905,226	193,604
50075	S&W Resident Counselor PAYROL...		186,872	-186,872
50080	S&W Coadjutant Noninstruction...	22,329,906	20,707,269	1,622,637
50081	S&W Coadjutant PTL Instruction...	67,732,519	81,220,185	-13,487,666
50090	S&W Student Employment PAYR...	39,917,247	44,996,862	-5,079,615
50098	S&W Manual Reallocation to Capi...		-7,107,851	7,107,851
50100	S&W Contracted PAYROLL DEPT...	7,427,911	8,094,797	-666,886
50110	S&W Fellowships	16,580,141	26,875,965	-10,295,824

<https://bireporting.rutgers.edu/#/workbooks/529/views>

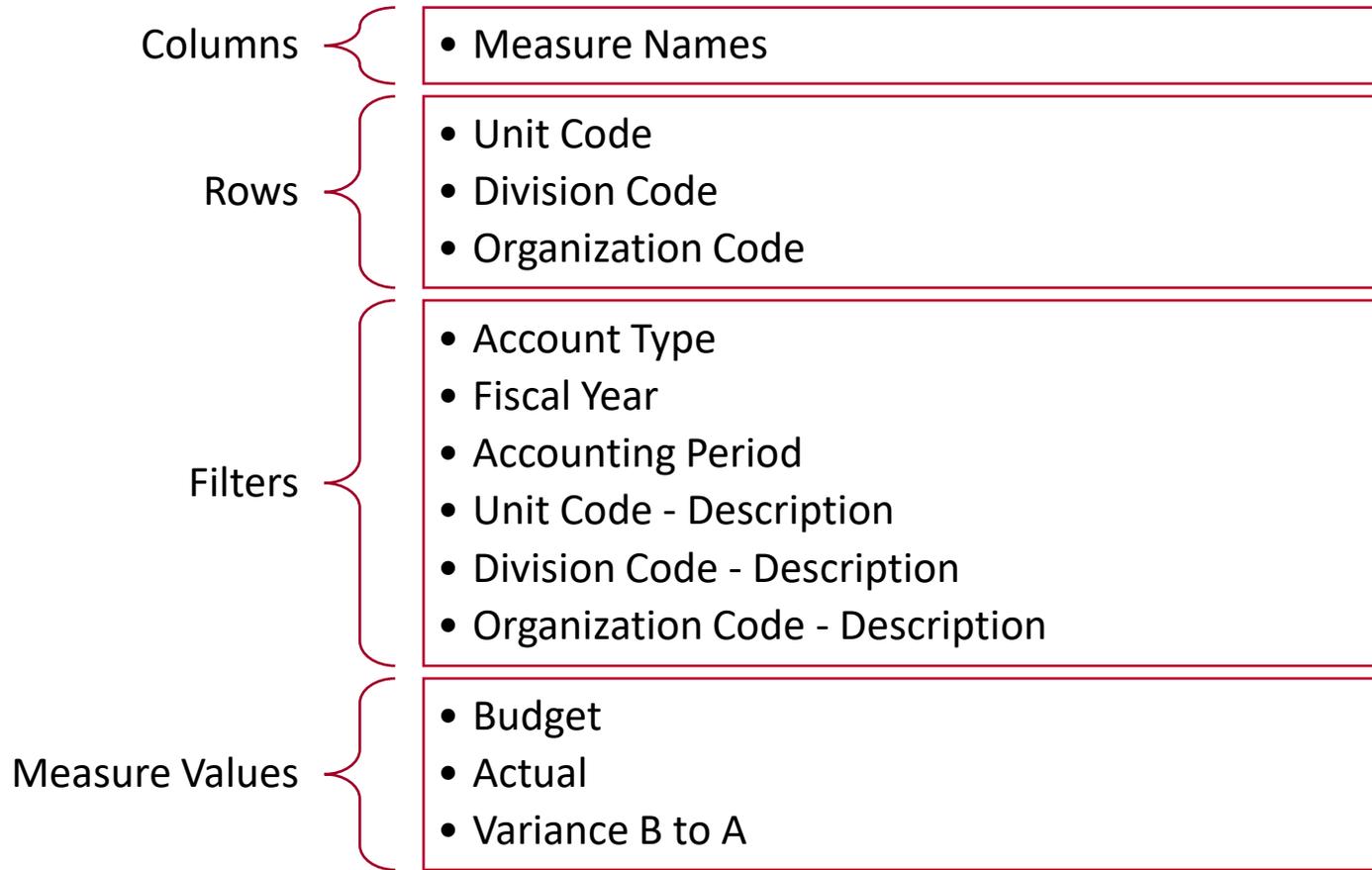
CREATING THE VIEWS

SUMMARY BY UDO

Summary by UDO

Unit Code - Description	Division Code - Description	Organization Code - Description	Budget	Actual	Variance B to A
100 - CMD Chancellor	1510 - University Controll..	3103 - Controller	-2,290,676	0	-2,290,676
	3500 - CMD Office of the Chancellor	1647 - Boathouse		175,702	-175,702
		2935 - Community Leader..	0	31,719	345,201
		3894 - Events & Programs	376,919	-1,509	1,509
		6330 - Office of Institutio..		1,835,300	574,913
		6428 - Office of the Chanc..			1,260,387
		8311 - Student Experientl..			
	3510 - CMD Development ..	3327 - Development Office	128,351	-9,827	138,179
	3520 - CMD External Relat..	7373 - Public Information ..	286,932	67,055	219,876
	3600 - CMD Office of the Provost	1066 - Academic Technolo..	275,416	72,854	202,561
		2032 - Center for Constitu..		934	-934
		4671 - Honors College	102,218	-17,445	119,663
		4993 - Institutional Resea..		0	0
		6344 - Office of Internatio..	98,558	14,750	83,808
		6390 - Office of Scholar D..		-202	202
		6484 - Office of the Provost	349,728	124,108	225,620
		7632 - Research & Sponso..	137,433	39,394	98,039
		8131 - Southern Regional ..	5,353,295	1,278,503	4,074,792
		8311 - Student Experientl..	29,129	-17,959	47,088
		9088 - Walter Rand Instit..	524,825	182,056	342,769
	3610 - CMD Undergraduate Education	3397 - Disability Services	-32,101	-8,517	-23,584
		3600 - Educational Oppor..	-137,375	-34,056	-103,319
		3602 - EOF Summer Under..	203,917	195,566	8,351
		3606 - EOF Academic Year..	638,569	144,980	493,589
		3609 - EOF Academic Year..	432,450	131,650	300,800
		5378 - Leadership Institute	32,776	12,185	20,592
		5380 - Learning Abroad A..	920,892	105,574	815,318
		5399 - Learning Center	116,608	8,788	107,821
		6246 - Off Campus Initiati..		669	-669
		6351 - Office of New Stud..	446,376	196,149	250,227
		8391 - Student Success	120,986	65,576	55,410
		8397 - Study Away Progra..			
		8745 - TRIO Student Supp..	212,495	84,124	128,371

This view will provide a summary of Budgets, Actuals, and their Variance by UDO. There are filters for the UDO string segments, as well as filters for Account Type, Accounting Period, and Fiscal Year.



INSTRUCTIONS

1. Drag column, row, and filter dimensions to their respective shelves. The **Account Type** filter is the only one hard-coded with a value: **Expenses**. **Measure Names** appears automatically when dragging multiple measures from the **Measures** pane to the view.

The screenshot shows the Oracle Cloud General Ledger Data (Revisions Test) interface. The main view is a pivot table titled "Summary by UDO". The table has columns for "Unit Code - Description", "Division Code - Description", "Organization Code - Description", and "Measure Values". The data is summarized by UDO, showing various organizational units and their associated measures. A red arrow points from the "Measures" pane on the left to the "Measure Values" column in the pivot table.

Unit Code - Description	Division Code - Description	Organization Code - Description	Measure Values
100 - CMD Chancellor	1510 - University Controll...	3103 - Controller	Abc
	3500 - CMD Office of the Chancellor	1647 - Boathouse	Abc
		2935 - Community Leader	Abc
		3894 - Events & Programs	Abc
		6330 - Office of Institution	Abc
		6428 - Office of the Chanc	Abc
		8311 - Student Experienc	Abc
	3510 - CMD Development	3327 - Development Office	Abc
	3520 - CMD External Relat	7373 - Public Information	Abc
	3600 - CMD Office of the Provost	1066 - Academic Technolo	Abc
		2032 - Center for Constitu	Abc
		4671 - Honors College	Show Me
		4993 - Institutional Resea	Abc
		6344 - Office of Internatio	Abc
		6390 - Office of Scholar D	Abc
		6484 - Office of the Provost	Abc
		7632 - Research & Sponso	Abc
		8131 - Southern Regional	Abc
		8311 - Student Experienc	Abc
		9088 - Walter Rand Instit	Abc
	3610 - CMD Undergraduate Education	3397 - Disability Services	Abc
		3600 - Educational Oppor	Abc
		3602 - EOF Summer Under	Abc
		3606 - EOF Academic Year	Abc
		3609 - EOF Academic Year	Abc
		5378 - Leadership Institute	Abc
		5380 - Learning Abroad A	Abc
		5399 - Learning Center	Abc
		6246 - Off Campus Initiati	Abc
		6351 - Office of New Stud	Abc
		8391 - Student Success	Abc
		8397 - Study Away Progra	Abc
		8745 - TRIO Student Supp	Abc

The screenshot shows the Filters shelf in the Oracle Cloud General Ledger Data (Revisions Test) interface. The shelf contains several filters, including "Account Type: Expense", "Location Code", "Organization Code", "Unit Code", "Measure Names", "Action (Account ...)", and "Period Name". A context menu is open over the "Account Type: Expense" filter, showing options: "Show Filter", "Apply to Worksheets" (with sub-options "All Using Related Data Sources" and "All Using This Data Source" selected), "Dimension", "Attribute", "Measure", and "Remove".

2. Set all filters (except **Measure Names**) to apply to **All Worksheets Using This Data Source** by right clicking on the filters in the filter shelf.

SUMMARY BY EXPENDITURE TYPE

Training Sample

File Data Worksheet Dashboard Analysis Map Format Help

Mike Constanza

Show Me

Data Analytics

Oracle Cloud General ...

Pages

Filters

- Fiscal Year: 2020
- Accounting Period
- Account Type: Expe...
- Unit Code - Descrip...
- Division Code - Des...
- Organization Code - ...
- Measure Names

Marks

Automatic

Color Size Text

Detail Tooltip

Measure Values

Measure Values

- SUM(Budget)
- SUM(Actual)
- AGG(Variance B to A)

Summary by Expenditure Type

Account Code - Description	Budget	Actual	Variance B to A
50010 - S&W Staff PAYRO..	1,016,045,669	264,015,017	752,030,653
50020 - S&W Tenured Fac..	341,886,745	90,219,602	251,667,143
50030 - S&W Tenure Track..	65,430,869	14,954,335	50,476,534
50040 - S&W NonTenured..	397,366,528	98,775,445	298,591,083
50050 - S&W TA & GA PAY..	48,445,364	6,778,103	41,667,261
50060 - S&W Post Doctor..	29,607,476	7,324,859	22,282,616
50070 - S&W Housestaff P..	69,245,370	18,887,923	50,357,446
50075 - S&W Resident Co..	223,000	28,142	194,858
50080 - S&W Coadjutant ..	22,527,156	18,555,105	3,972,051
50081 - S&W Coadjutant P..	74,422,884	18,813,946	55,608,938
50090 - S&W Student Emp..	40,809,084	14,243,669	26,565,416
50098 - S&W Manual Reall..	-1,532,027	-541,348	-990,679
50100 - S&W Contracted P..	8,674,341	2,039,165	6,635,176
50110 - S&W Fellowships	22,335,745	5,400,615	16,935,130
50115 - S&W Pre & Post F..	7,566,046	1,970,533	5,595,513
50120 - S&W Hourly Empl..	34,940,958	12,545,852	22,395,106
50130 - S&W to Estate for..	5,000	62,947	-57,947
50140 - S&W Non Fringe E..	657,756	227,269	430,487
50180 - S&W Auto Accrual..		2,381	-2,381
50181 - S&W Manual Accr..		-13,243,235	13,243,235
50182 - S&W Manual Reall..	-54,971	0	-54,971
50183 - S&W Student Emp..		0	0
50184 - S&W Hourly Empl..		11,889	-11,889
50190 - S&W Payroll Susp..	381,909	238,765	143,144
50199 - S&W Salary Conti..	2,835,929		2,835,929
50210 - S&W Overtime PA..	24,115,729	8,926,486	15,189,242
50220 - S&W Shift Differe..	4,578,026	778,519	3,799,507
50240 - S&W Overtime Ma..		126	-126
50410 - Bonus Faculty	223,990	1,883,502	-1,659,512
50415 - Bonus Faculty Ma..	4,012,500	52,563	3,959,937
50430 - Bonus Staff	158,792	113,475	45,317
50440 - Other Comp Facul..	67,519,970	0	67,519,970
50441 - Other Comp Facul..		-498,015	498,015

Fiscal Year

- (All)
- 2014
- 2015
- 2016
- 2017

Accounting Period

- (All)
- APR-15
- APR-16
- APR-17
- APR-18

Account Type

- (All)
- Asset
- Expense
- Liability
- Capital

Unit Code - Description

- (All)
- 100 - CMD Chancell...
- 110 - CMD FASC Fa...
- 120 - CMD CLAW Sc...
- 130 - CMD SDR Ca...

Division Code - Descripti...

- (All)
- 1000 - President Pr...
- 1005 - President U...
- 1010 - President U...
- 1015 - General Ca...

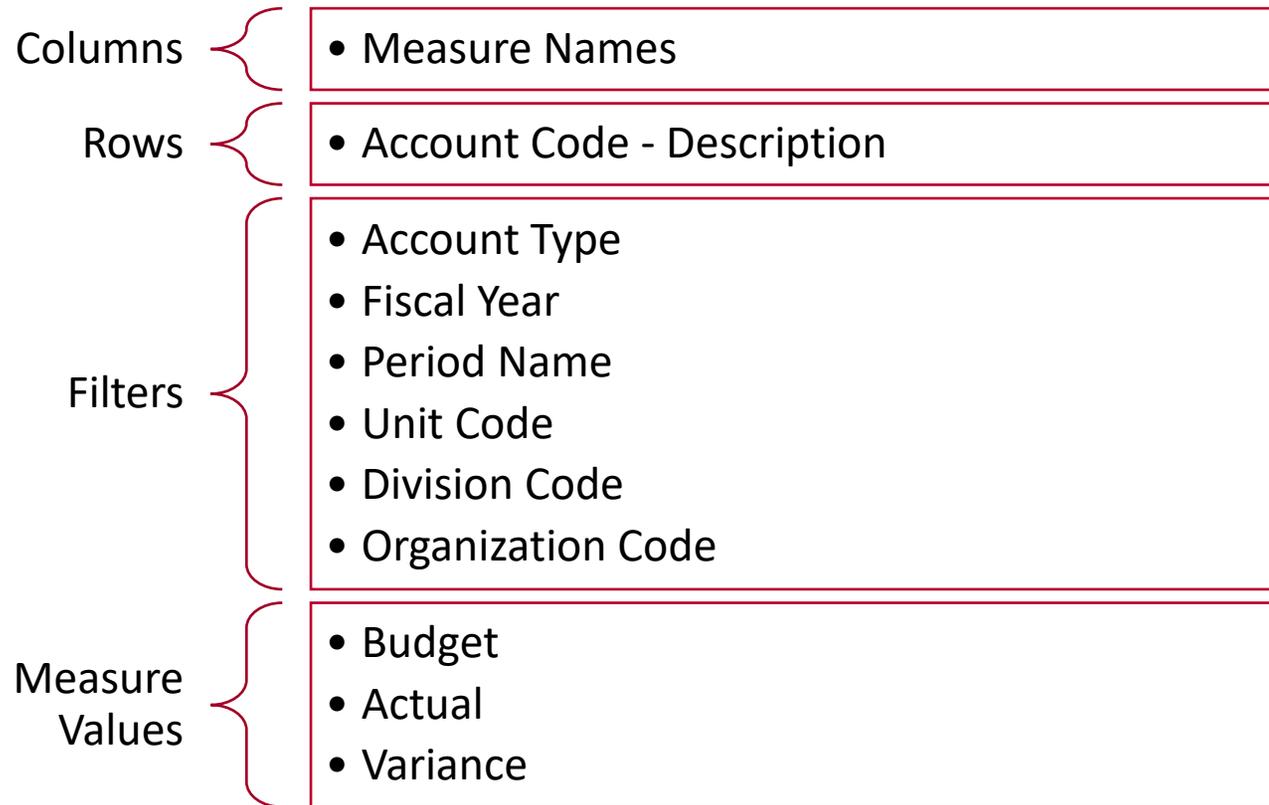
Organization Code - Des...

- (All)
- 0000 - ORGANIZATI...
- 1010 - 4H Camp
- 1012 - 4H Youth De...
- 1020 - Abbott Lead...

Summary by UDO Summary by Expenditure Type

This view will provide a summary of Budgets, Actuals, and their Variance by Natural Account (Expenditure Type) and its description.

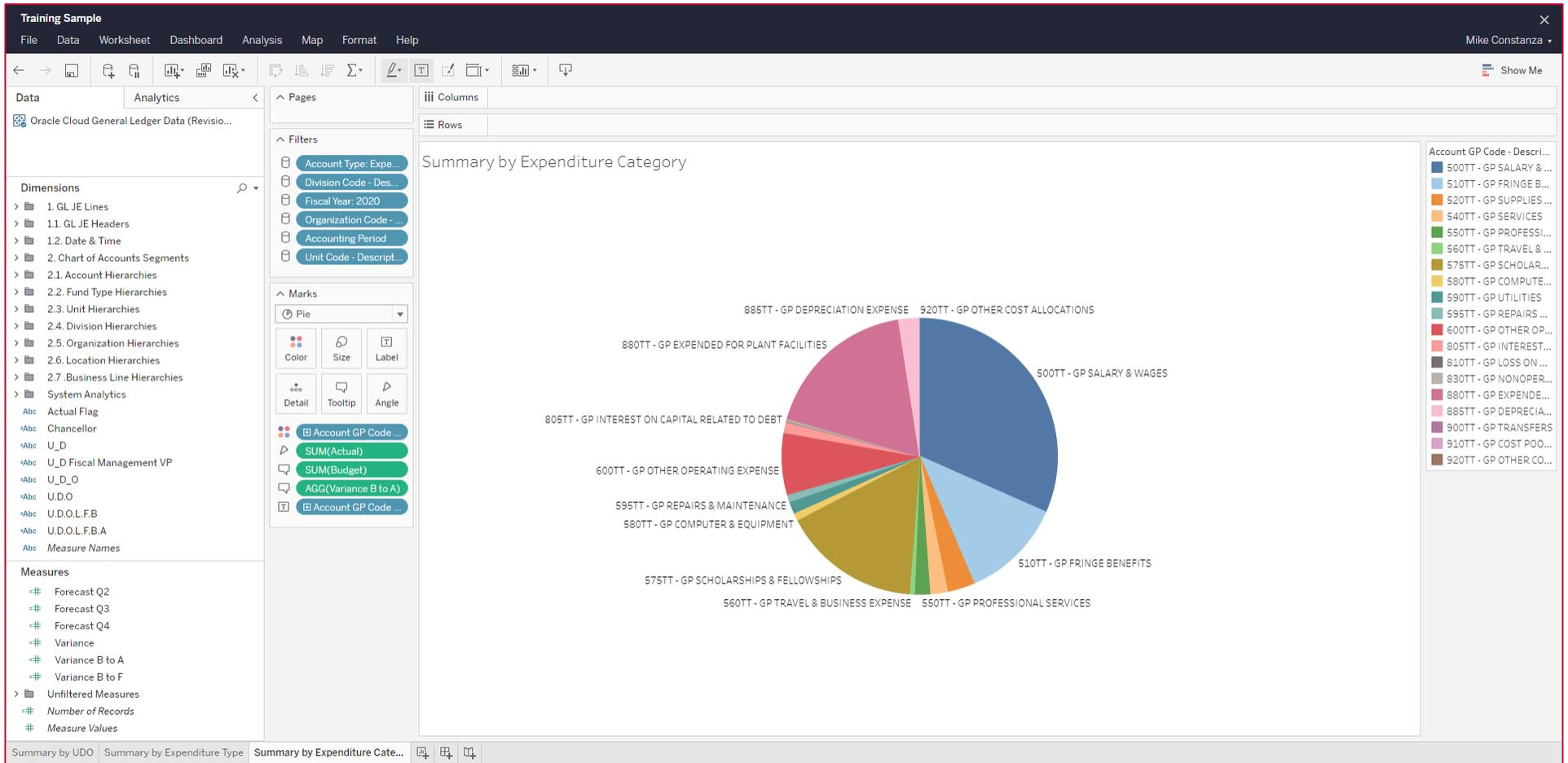
REFERENCE



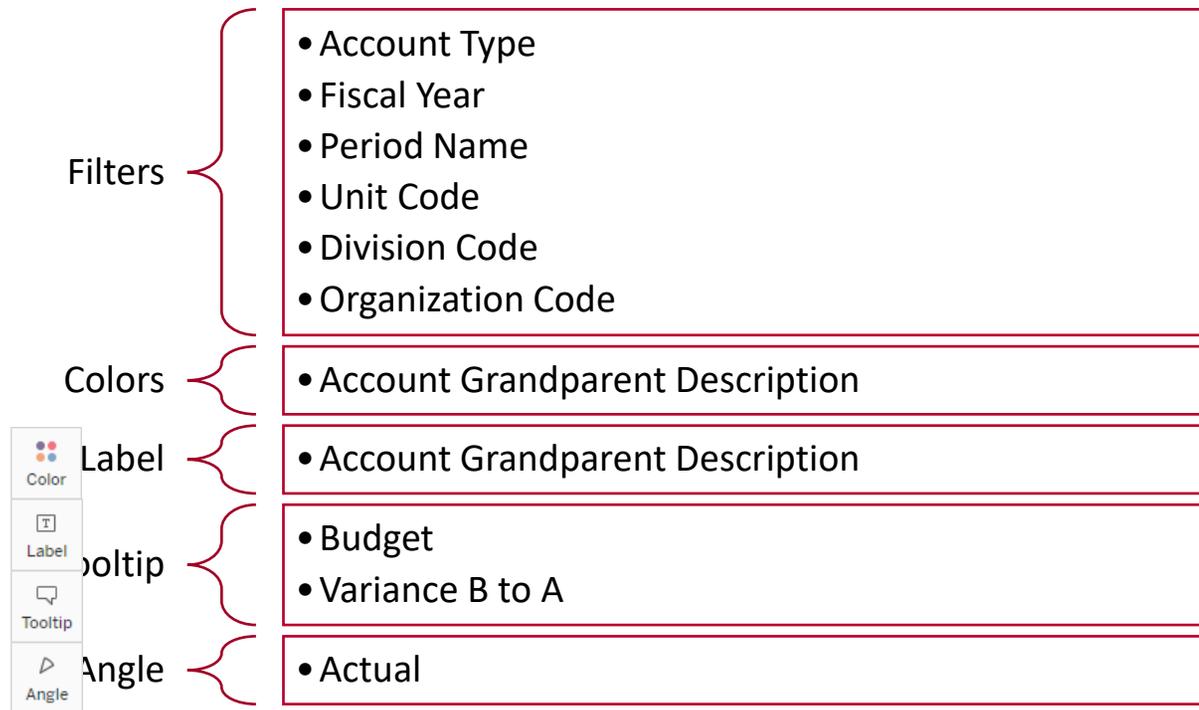
INSTRUCTIONS

1. Create a new worksheet by hitting the  icon at the bottom of the screen.
2. Drag column, row, and filter dimensions to their respective shelves. If you followed the directions for setting the filters in the previous view, they will appear after dragging your first dimension or measure onto the view. **Measure Names** will appear automatically after dragging multiple measures from the **Measures** pane to the view.

EXPENSES BY EXPENDITURE CATEGORY PIE CHART

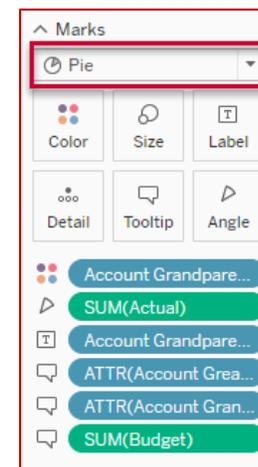


This view shows expenses broken down by Expenditure Category (GP Account) in the Account Hierarchy in a pie chart.



INSTRUCTIONS

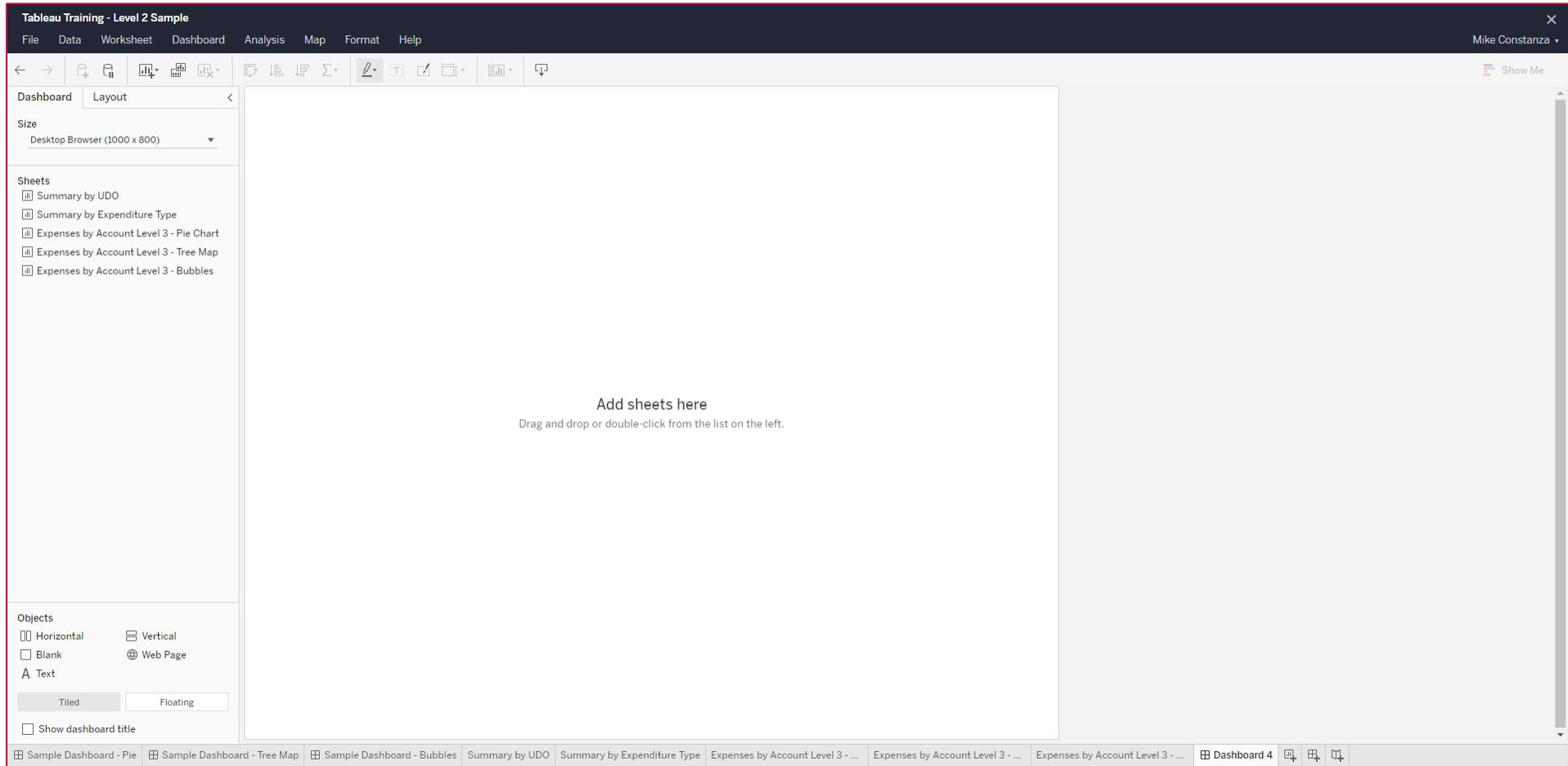
1. Create a new worksheet by hitting the  icon at the bottom of the screen.
2. In the **Marks** pane, set the mark type to **Pie**.
3. Drag the dimensions and measures to the relevant mark icons based on the reference above.
4. Click the  icon and select **Entire View** to resize the pie chart to fill the entire worksheet.



CREATING THE DASHBOARD

LAYOUT

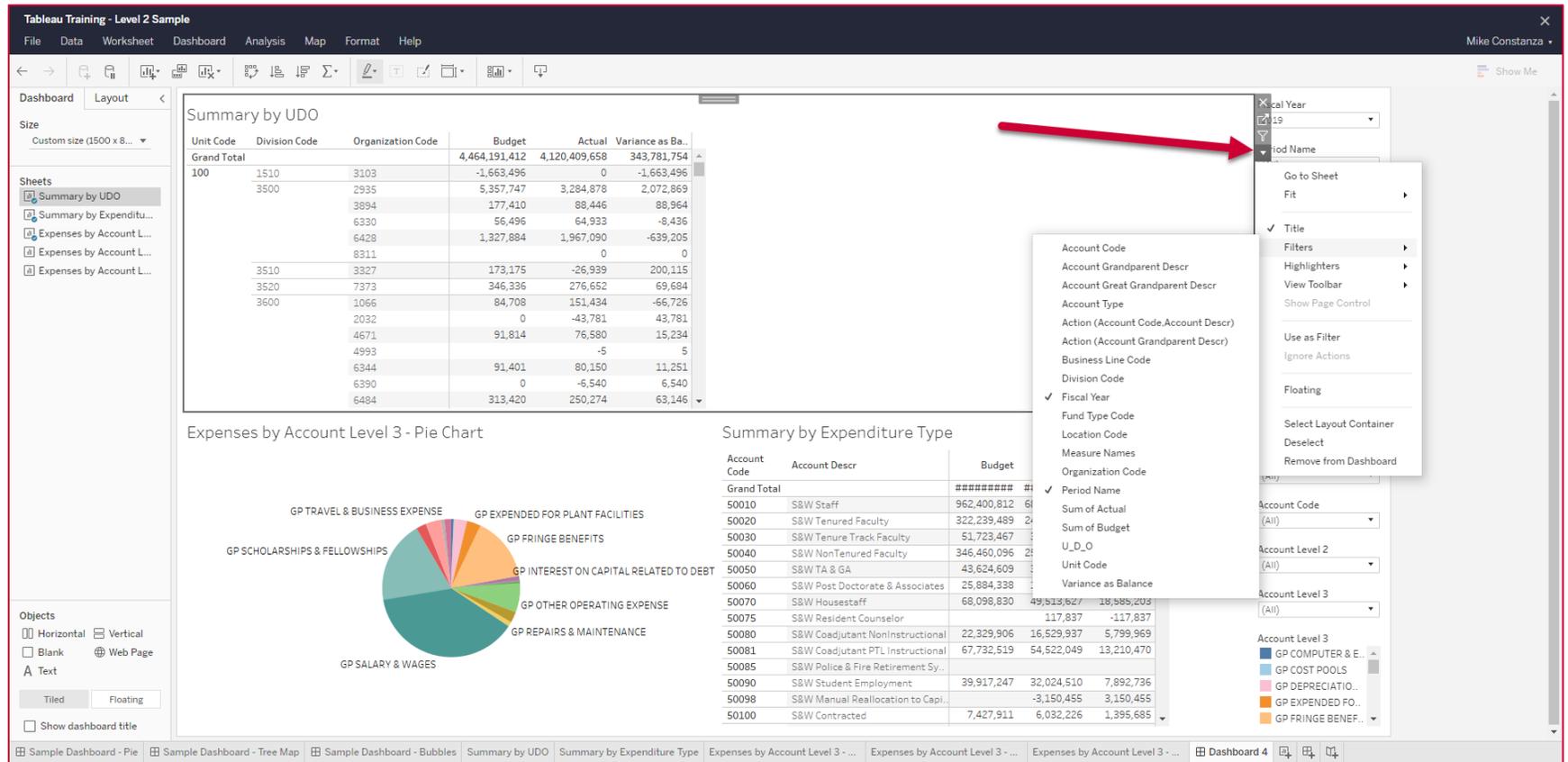
1. Click the  icon at the bottom of the screen to create a new dashboard.



2. Drag the sheets from the **Sheets Pane** on the left-hand side to the canvas in the following pattern:

Summary by UDO	
Summary by Expenditure Category	Summary by Expenditure Type

3. Any filters that were visible in the worksheets will be visible in the dashboard. For the rest that remain, you can add them by selecting a view and clicking the  icon to access the view's menu. Alternatively, you can select the view, click on the  (Show/Hide Cards) icon and add filters from that menu.



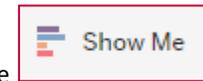
The screenshot shows a Tableau dashboard with three main views: a table titled 'Summary by UDO', a pie chart titled 'Expenses by Account Level 3 - Pie Chart', and another table titled 'Summary by Expenditure Type'. The 'Summary by UDO' table has columns for Unit Code, Division Code, Organization Code, Budget, Actual, and Variance as Balance. The pie chart shows various expense categories like 'GP SALARY & WAGES' and 'GP TRAVEL & BUSINESS EXPENSE'. The 'Summary by Expenditure Type' table lists account codes and descriptions with budget and actual values. A red arrow points to the 'More Options' menu for the 'Summary by UDO' view, which is open, showing a list of filters and actions that can be applied to that view.

4. You can modify filters by clicking on the **More Options** triangle and selecting a filter type. The recommended types are **Multiple Choice Dropdown** and **Multiple Choice Custom List**.

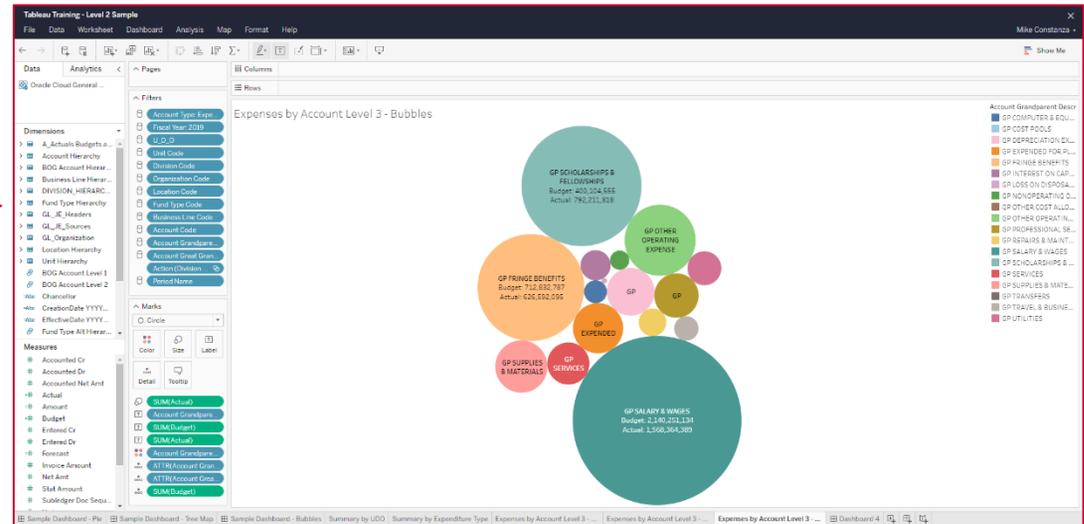
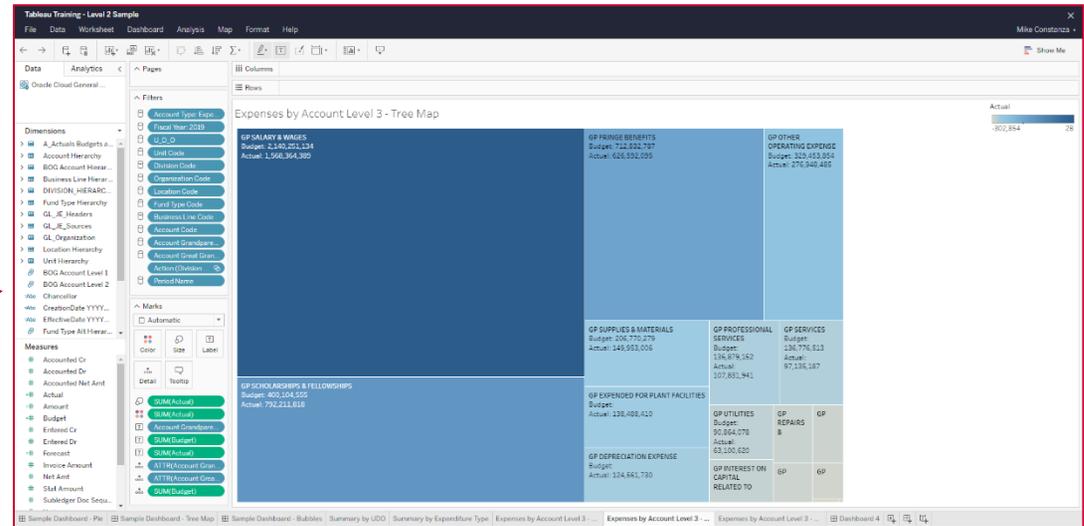
5. Resize the top view (Summary by UDO) by selecting it, clicking the  (Fit) icon, and selecting **Fit Width**. Repeat this for the other views as necessary depending on your layout.

ALTERNATIVE VISUALIZATIONS

If a pie chart is not your ideal visualization for breaking down the expenditure categories, you can experiment with alternative visualizations. The recommended approach is to



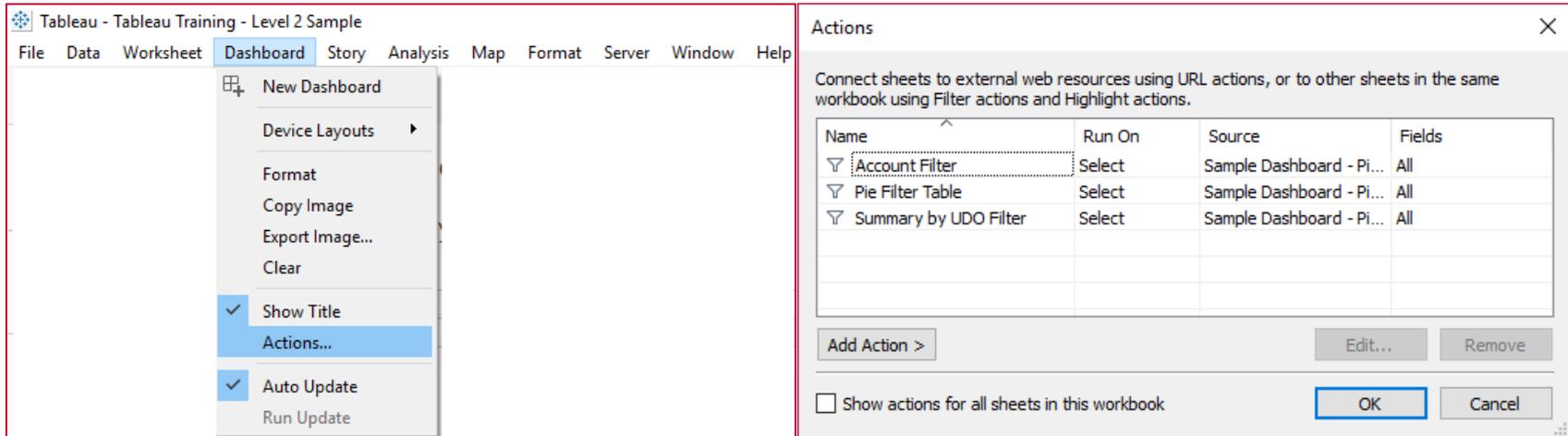
duplicate your current visualization (right-click the worksheet tab at the bottom and select **Duplicate**) and then use the **Show Me** button to have Tableau try to convert your current visualization to another. The sample training workbook has examples of a Tree Map and a Bubble Chart made this way.



ACTIONS (DEVELOPED IN TABLEAU DESKTOP ONLY)

Actions are interactions between different views within a dashboard. They can only be created in **Tableau Desktop**, but once the workbook is published to Tableau Enterprise the actions can be utilized by all users. This section will show you how to create a basic action that can replace many of your dashboard's filters.

1. The actions menu can be accessed via the main menu: **Dashboard** (or Worksheet if creating worksheet actions) > **Actions**
2. Click **Add Action** > and select **Filter**



3. You can now control what views are clickable (**Source Sheets**), what views are affected (**Target Sheets**), whether the action is run on **Hover**, **Select**, or as a **Menu** option (**Run action on**), and what fields should be filtered, **All Fields** or **Selected Fields**. Since this particular dashboard shares all filters between all worksheets, you can select all as sources and targets and filter by **All Fields**.

You can now click on each of the views to filter the others.

Add Filter Action

Name: Filter 1

Source Sheets:

Sample Dashboard - Pie

Run action on:

Hover

Select

Menu

Run on single select only

Target Sheets:

Sample Dashboard - Pie

Clearing the selection will:

Leave the filter

Show all values

Exclude all values

Target Filters:

Selected Fields

All Fields

Source Field	Target Field	Target Data Source

Add Filter... Edit... Remove

OK Cancel

Training Workbook - <https://bireporting.rutgers.edu/#/workbooks/529/views>

Rutgers UCO Tableau Page - <https://uco.rutgers.edu/tableau-reporting>

Tableau Training - <https://www.tableau.com/learn/training>