

Database Management Systems

Tableau



UNIVERSITY OF
MARYLAND

ROBERT H. SMITH
SCHOOL OF BUSINESS

DR. ADAM LEE

Outline

- Introduction to Tableau
- Tableau Desktop for Smith
- Access SQL Server Off-Campus



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Tableau

- Founded in Mountain View, California in January 2003
- Tableau Desktop / Prep / Server / Online
- Release 2019
- Desktop Database
 - IBM DB2, Microsoft SQL Server, MongoDB, MySQL, Oracle, PostgreSQL, SAP Sybase, etc.
- Cloud/Big-Data Service
 - Apache (Hadoop, Hive, Pig, Spark, etc.), Amazon (AWS, Athena, Aurora, EMR, Redshift, etc.), Cloudera, Google (Analytics, BigQuery, Sheets, etc.), Salesforce, Teradata, etc.



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Tableau

www.tableau.com



Products Solutions Learning Community Support About

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TRY NOW



Upgrade to Tableau 2018.3 for heatmaps, set actions, and more!

Changing the way you think about data

THE TABLEAU PLATFORM

SEE IT IN ACTION

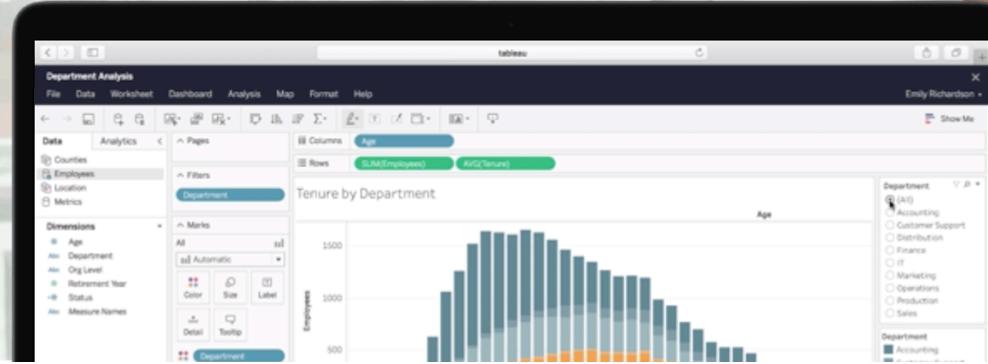


Tableau Products

- Tableau Desktop tableau.com/products/desktop
- Tableau Prep tableau.com/products/prep
- Tableau Server tableau.com/products/server
- Tableau Online tableau.com/products/cloud-bi
- Tableau Mobile tableau.com/products/mobile

- Tableau Public public.tableau.com
- Tableau Developer Program tableau.com/developer
- Embedded Analytics tableau.com/embedded-analytics



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Tableau Academic Programs

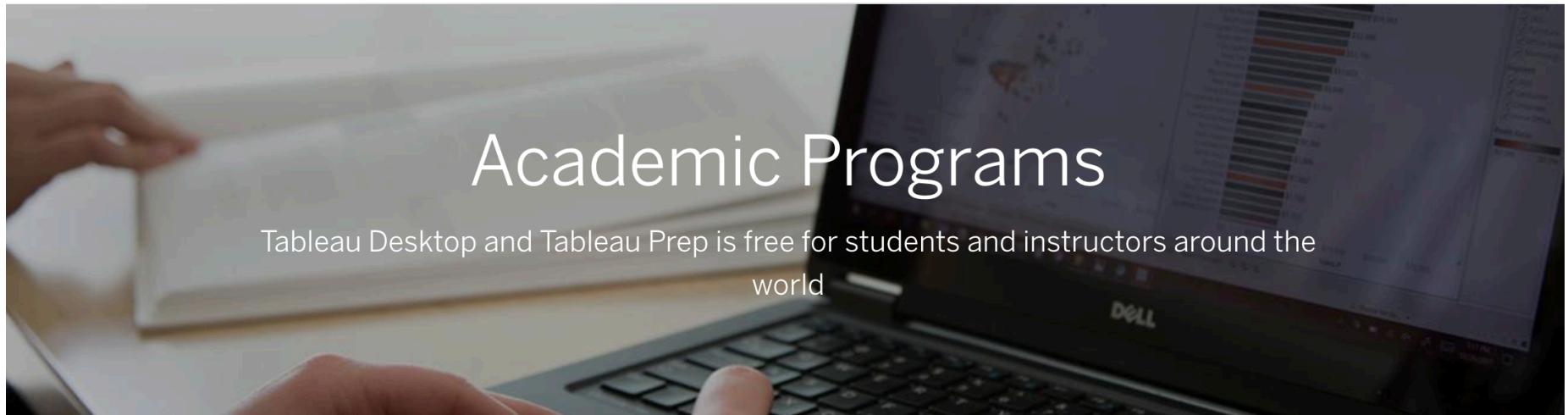
tableau.com/academic



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Academic Programs

Tableau Desktop and Tableau Prep is free for students and instructors around the world



Tableau helps you see and understand your data

Whether you're a student creating scatter plots for a project or an educator instructing an economics course, Tableau will enhance learning and teaching

Tableau for Students

[tableau.com/academic/students](https://www.tableau.com/academic/students)



Products Solutions Learning Community Support About

PRICING SIGN IN

TRY NOW

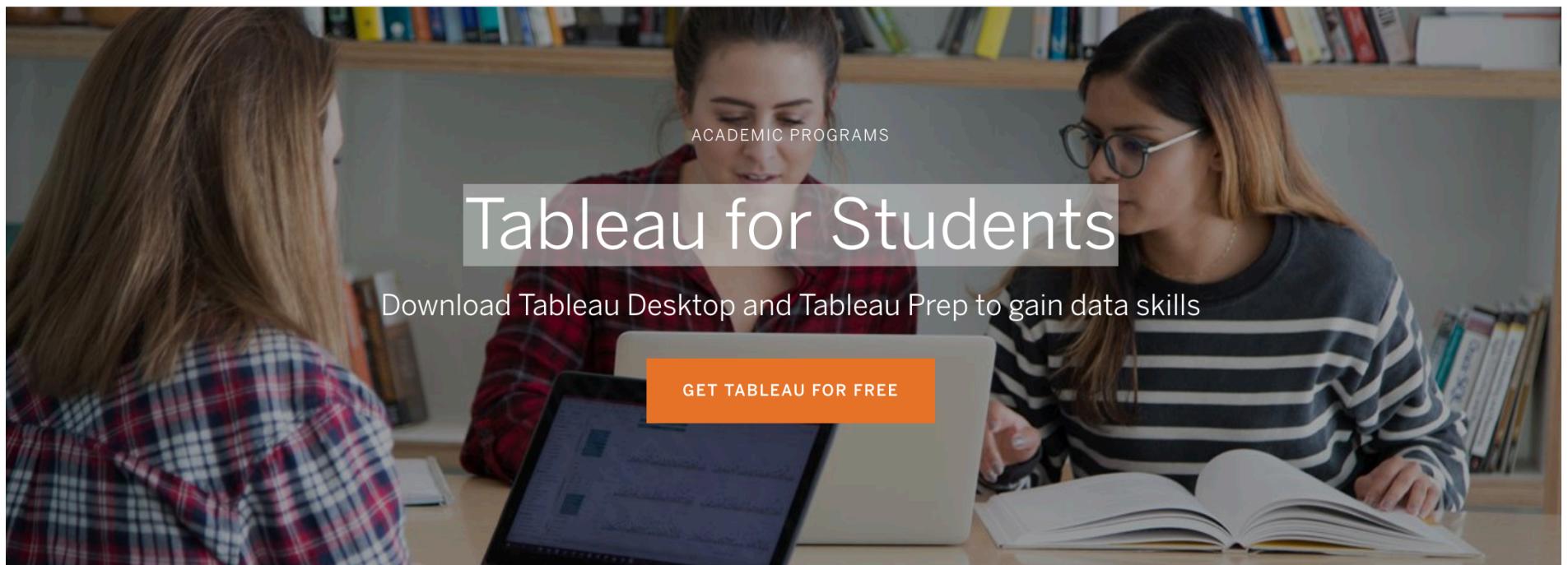


ACADEMIC PROGRAMS

Tableau for Students

Download Tableau Desktop and Tableau Prep to gain data skills

GET TABLEAU FOR FREE



Generation Data

Outline

- Introduction to Tableau
- Tableau Desktop for Smith
- Access SQL Server Off-Campus



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Virtually Smith: vsmith.umd.edu

virtually Smith 

BOOKMARKS **CATALOG** 

 RStudio 	 SDC Platinum V 4.0.4.0 	 Smith IT Website Website  	 SQL Server Management...   
 Student Desktop   	 Tableau Student Desktop Website   	 VBIC - Virtual Business Info... Website  	 Visio 2016   

Starting Tableau 2019 on Student Desktop



Step 1: Logging into Microsoft SQL Server

The screenshot shows the Tableau software interface with a yellow header bar. The main window title is "Tableau - Book1". The menu bar includes "File", "Data", "Server", and "Help". On the left, a sidebar titled "Connect" lists options like "Search for Data", "Tableau Server", "To a File" (with sub-options like "Microsoft Excel", "Text file", "JSON file", "Microsoft Access", "PDF file", "Spatial file", "Statistical file", and "More..."), and "To a Server" (with sub-options like "Microsoft SQL Server" which is highlighted with a red box, "MySQL", "Oracle", "Amazon Redshift", and "More..."). The central area has a title "Open" and a sub-dialog titled "Microsoft SQL Server". This dialog contains fields for "Server" (set to "doitsqlx.rhsmith.umd.edu,9703") and "Database" (set to "BUDT703_DB_Student_000"). Below these are two radio button options: "Use Windows Authentication (preferred)" and "Use a specific username and password" (which is selected and highlighted with a red box). The "Username" field is set to "BUDT703_Student_000" and the "Password" field contains a masked password. At the bottom of the dialog are "Initial SQL..." and "Sign In" buttons. To the right of the dialog, a "Discover" sidebar lists "Training" (with "View all 87 training videos"), "Resources" (with "Get Tableau Prep", "Blog - Read latest post", "The NEW Community Forums", "Sample data for Relationships", and "Find your Learning Path - take the quiz"), and an orange "Update to 2020.3.2 Now" button. The bottom navigation bar includes "Lee-703-Tbl" on the left and "ROBERT H. SMITH SCHOOL OF BUSINESS" on the right.

Step 2: SELECT FROM One Table

The screenshot shows the Tableau Data Source interface. On the left, the 'Table' pane lists various database tables: Customer_T, DoesBusinessIn_T, Employee_T (which is highlighted with a red box), EmployeeSkills_T, Order_T, OrderLine_T, ProducedIn_T, Product_T, ProductLine_T, RawMaterial_T, Salesperson_T, New Custom SQL, and New Union. In the center, the 'BUDT703_DB_Student_049' database is selected. A red box highlights the 'Drag tables here' placeholder area, which contains a small grid icon. At the bottom, there are buttons for Data Source, Sheet1, and other sheet options.

Step 3: SELECT * FROM Table

Tableau - Book1

File Data Server Window Help

Connections Add

doitsqlx.rhs...umd.edu,9703 Microsoft SQL Server

Database BUDT703_DB_Student_049

Table

- Customer_T
- DoesBusinessIn_T
- Employee_T
- EmployeeSkills_T
- Order_T
- OrderLine_T
- ProducedIn_T
- Product_T
- ProductLine_T
- RawMaterial_T
- Salesperson_T
- New Custom SQL
- New Union
- Go to Worksheet

Employee_T

Connection
Live Extract

Filters 0 | Add

Need more data?
Drag tables here to relate them. [Learn more](#)

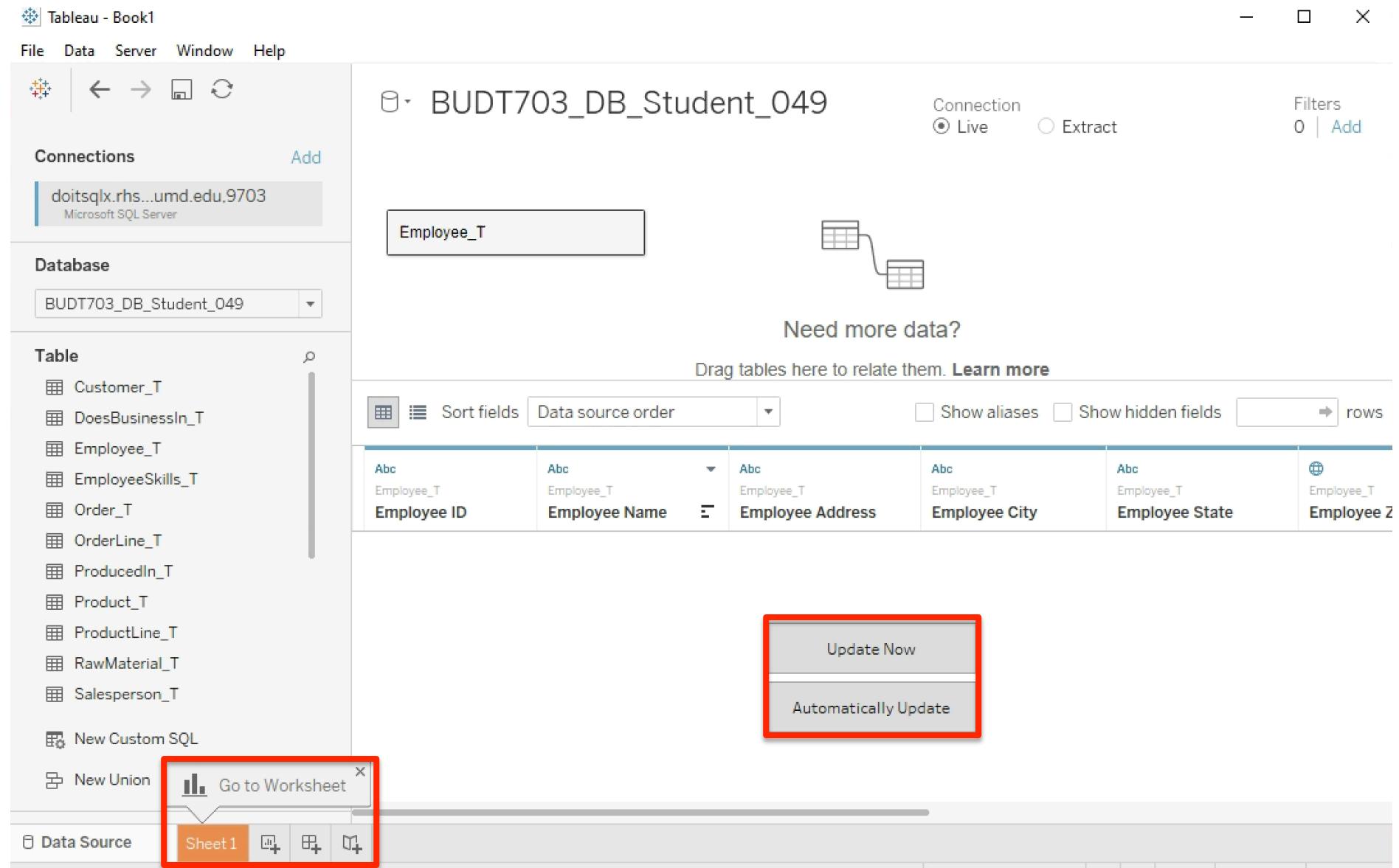
Sort fields Data source order ▾

Show aliases Show hidden fields rows

Abc Employee_T Employee ID	Abc Employee_T Employee Name	Abc Employee_T Employee Address	Abc Employee_T Employee City	Abc Employee_T Employee State	Employee_T Employee Z
----------------------------	------------------------------	---------------------------------	------------------------------	-------------------------------	-----------------------

Update Now
Automatically Update

Data Source Sheet1



Step 4: GROUP BY

Tableau - Book1

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Data Analytics BUDT703_DB_Student...

Search

Tables

- Employee Address
- Employee Birth Date
- Employee City
- Employee Date Hired
- Employee ID
- Employee Name
- Employee State
- Employee Supervisor
- Employee Zip Code
- Measure Names
- # Employee_T (Count)
- # Latitude (generated)
- # Longitude (generated)
- # Measure Values

Pages Columns Employee ID
Rows Employee City

Marks Automatic Color Size Text Detail Tooltip

Sheet 1

Employee ID

Employee C...	000-00-..	123-44-..	334-45-..	454-56-..	559-55-..
Clearwater					Abc
Knoxville					Abc
Nashville					Abc

For text tables try

1 or more Dimensions

1 or more Measures

Data Source Sheet 1

5 marks 3 rows by 5 columns

Lee-703-Tbl

Step 5: SELECT COUNT()

The screenshot shows the Tableau interface with the following details:

- File Menu:** File, Data, Worksheet, Dashboard, Story, Analysis, Map, Format, Server, Window, Help.
- Data Source:** BUDT703_DB_Student...
- Tables:** Employee Address, Employee Birth Date, Employee City, Employee Date Hired, Employee ID, Employee Name, Employee State, Employee Supervisor, Employee Zip Code, Measure Names, Employee_T (Count), Latitude (generated), Longitude (generated), Measure Values.
- Marks:** Automatic, Color, Size, Text, Detail, Tooltip.
- Sheet 1:** Employee C... 000-0, Clearwater, Knoxville, Nashville.
- Employee ID Context Menu (opened by red box):**
 - Filter...
 - Show Filter
 - Show Highlighter
 - Sort...
 - Format...
 - Show Header** (checked)
 - Include in Tooltip** (checked)
 - Edit Aliases...
 - Dimension**
 - Attribute**
 - Measure** (selected)
 - Minimum
 - Maximum
 - Count** (selected)
 - Count (Distinct)
 - Edit in Shelf
 - Remove
- Shelf:** Data Source (selected), Sheet 1, 5 marks, 3 rows by 5 columns.
- Toolbars:** Standard, Show Me.
- Right Panel:** Shows various visualization icons for maps, charts, and tables.

Step 6: Bar Chart and Color

Tableau - Book1

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Data Analytics BUDT703_DB_Student...

Search

Tables

- Employee Address
- Employee Birth Date
- Employee City
- Employee Date Hired
- Employee ID
- Employee Name
- Employee State
- Employee Supervisor
- Employee Zip Code
- Measure Names
- # Employee_T (Count)
- (Latitude (generated))
- (Longitude (generated))
- # Measure Values

Pages Columns CNT(Employee ID)

Rows Employee City

Marks Automatic

Color (highlighted with red box)

Size Label Detail Tooltip

Sheet 1

Employee Ci..

Employee City	Count of Employee ID
Clearwater	1
Knoxville	2
Nashville	1

Count of Employee ID

For horizontal bars try

0 or more Dimensions

1 or more Measures

Data Source Sheet 1

3 marks 3 rows by 1 column SUM of CNT(Employee ID): 5

Lee-703-Tbl

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Step 7: Add New Worksheet

Tableau - Book1

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Data Analytics BUDT703_DB_Student...

Search

Tables

- Employee Address
- Employee Birth Date
- Employee City
- Employee Date Hired
- Employee ID
- Employee Name
- Employee State
- Employee Supervisor
- Employee Zip Code
- Measure Names
- # Employee_T(Count)
- # Latitude (generated)
- # Longitude (generated)
- # Measure Values

Pages Columns CNT(Employee ID)
Rows Employee City

Marks Automatic Color Size Label Detail Tooltip

Sheet 1

Employee Ci..

Employee City	Count of Employee ID
Clearwater	1
Knoxville	2
Nashville	1

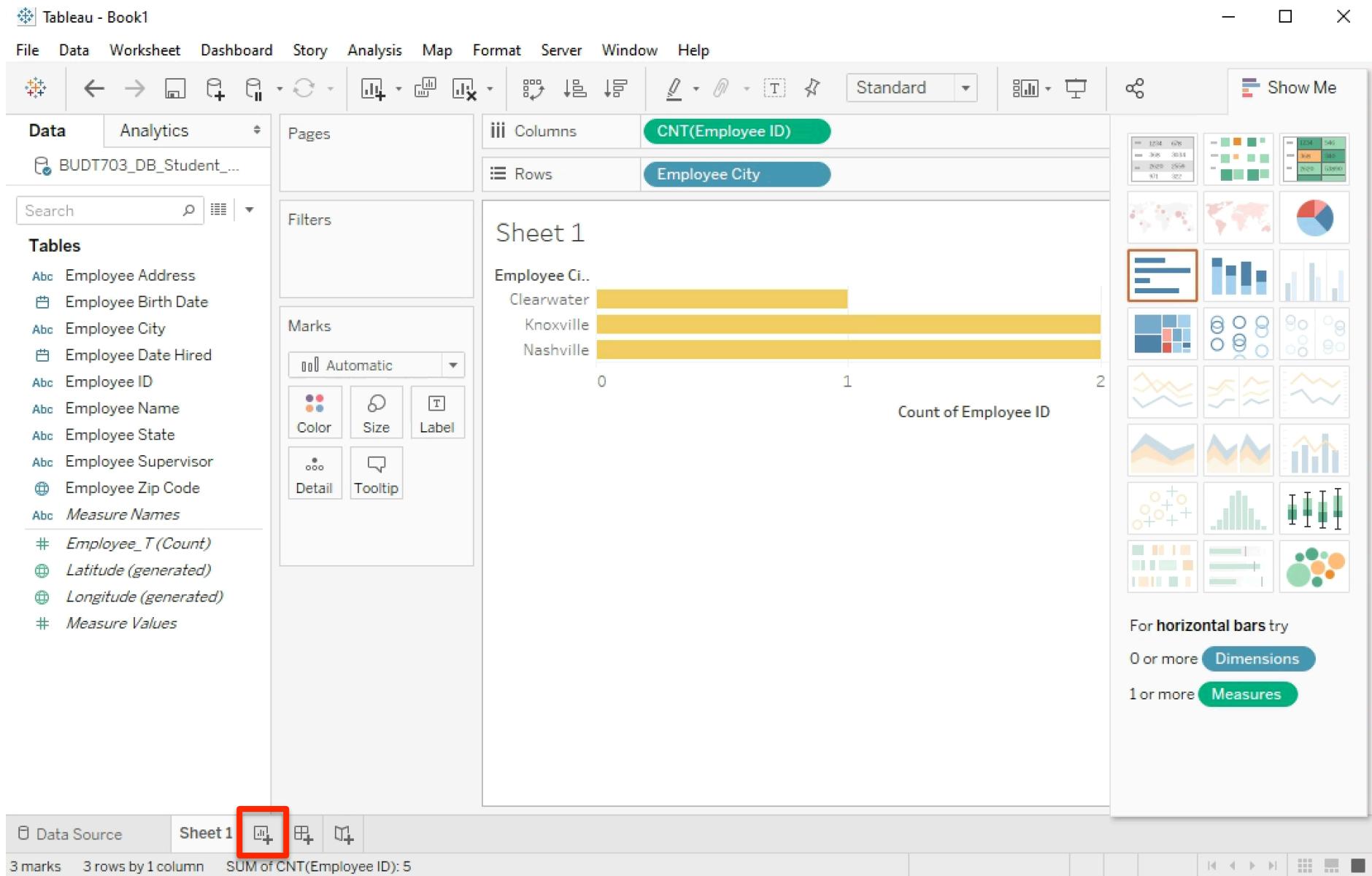
For horizontal bars try

0 or more Dimensions

1 or more Measures

Data Source Sheet 1 

3 marks 3 rows by 1 column SUM of CNT(Employee ID): 5



Step 8: SELECT Multiple Columns

Tableau - Book1

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Data Analytics BUDT703_DB_Student...

Search

Tables

- Employee Address
- Employee Birth Date
- Employee City
- Employee Date Hired
- Employee ID
- Employee Name
- Employee State
- Employee Supervisor
- Employee Zip Code
- Measure Names
- Employee_T(Count)
- Latitude (generated)
- Longitude (generated)
- Measure Values

Pages

Filters

Marks

- Circle
- Color
- Size
- Label
- Detail
- Tooltip

Columns Employee Name

Rows YEAR(Employee B..) YEAR(Employee D..)

Sheet 2

Employee Name

Year of Employee B..	Year of Employee D..	Laura	Lawrence	Mary	Phil	Robert
Null	2000	●				
1957	1999				●	
1963	1999		●			
1964	1998					●
1969	2000			●		

For text tables try

1 or more Dimensions

1 or more Measures

Data Source Sheet 1 Sheet 2

5 marks 5 rows by 5 columns

The screenshot shows a Tableau interface with a scatter plot on 'Sheet 2'. The plot displays the relationship between the year an employee was born ('Year of Employee B.') and the year they were hired ('Year of Employee D.'). The x-axis represents the year of hire, and the y-axis represents the year of birth. Five data points are plotted: one for a birth year of 1957 (hired 1999), one for 1963 (hired 1999), one for 1964 (hired 1998), one for 1969 (hired 2000), and one for a null birth year (hired 2000). The plot area includes a legend for 'Marks' with 'Circle' selected. The top shelf of the data pane shows 'Employee Name' as the column and 'YEAR(Employee B..)' and 'YEAR(Employee D..)' as the rows. The bottom shelf of the data pane shows 'Circle' as the mark type. The right side of the screen features a gallery of various chart types.

Step 9: SELECT Calculated Column

The screenshot shows the Tableau interface with the 'Analysis' menu open. The 'Create Calculated Field...' option is highlighted with a red box. The main workspace displays a scatter plot titled 'Employee Name' with five data points corresponding to employees: Laura, Lawrence, Mary, Phil, and Robert. The plot includes a legend and a color key. To the right of the plot is a gallery of various chart types. The bottom left shows the data source information: 'Lee-703-Tbl' and '5 marks 5 rows by 5 columns'. The bottom right features the page number '18' and the 'ROBERT H. SMITH SCHOOL OF BUSINESS' logo.

Tableau - Book1

File Data Worksheet Dashboard Story **Analysis** Map Format Server Window Help

Show Mark Labels
Aggregate Measures
Stack Marks
View Data...
Explain Data...
Reveal Hidden Data

Percentage Of

Totals

Forecast

Trend Lines

Special Values

Table Layout

Legends

Filters

Highlighters

Parameters

Create Calculated Field...

Edit Calculated Field

Cycle Fields

Swap Rows and Columns Ctrl+W

Employee Name

Employee Name

Laura Lawrence Mary Phil Robert

Ellenburg Haley Smith Morris Lewis

1234 4567
368 3614
2629 2599
91 322

For text tables try

1 or more Dimensions

1 or more Measures

Data Source Sheet 1 Sheet 2
5 marks 5 rows by 5 columns

Step 10: SELECT DATEDIFF()

Tableau - Book1

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Data Analytics BUDT703_DB_Student...

Search

Tables

- Employee Address
- Employee Birth Date
- Employee City
- Employee Date Hired
- Employee ID
- Employee Name
- Employee State
- Employee Supervisor
- Employee Zip Code
- Measure Names
- # Age Hired
- # Employee_I (Count)
- # Latitude (generated)
- # Longitude (generated)
- # Measure Values

Pages Columns Employee Name

Rows YEAR(Employee B..) YEAR(Employee D..)

Filters

Marks

Age Hired

DATEDIFF('year',[Employee Birth Date],[Employee Date Hired])
DATEDIFF(date_part,start_date,end_date,[start_of_week])

The calculation is valid.

Apply OK

Robert Lewis

For lines (discrete) try
1 date □
0 or more Dimensions
1 or more Measures

Data Source Sheet 1 Sheet 2
5 marks 5 rows by 5 columns

Step 11: Filtering and Formatting

The screenshot shows the Tableau interface with the following details:

- Top Bar:** Tableau - Book1, File, Data, Worksheet, Dashboard, Story, Analysis, Map, Format, Server, Window, Help.
- Toolbars:** Standard, Show Me.
- Left Panel (Tables):** Employee Address, Employee Birth Date, Employee City, Employee Date Hired, Employee ID, Employee Name, Employee State, Employee Supervisor, Employee Zip Code, Measure Names, Age Hired, Employee_T (Count), Latitude (generated), Longitude (generated), Measure Values.
- Rows and Columns:** Employee Name (Columns), Age Hired (Rows).
- Marks Card:** Marks type set to Circle, with Color, Size, and Label options. The Color button is highlighted with a red box.
- Edit Colors Dialog:** A modal window titled "Edit Colors [Age Hired]". It shows a palette with various color swatches and names. The "Color" section has an "Edit Colors..." button highlighted with a red box. The "Effects" section includes Border (Automatic) and Halo (None). The "Palette" section lists numerous color and diverging color schemes:
 - Automatic: Green, Red, Purple, Brown, Gray, Gray Warm, Blue-Teal, Orange-Gold, Green-Gold, Red-Gold, Orange-Blue Diverging, Red-Green Diverging, Green-Blue Diverging, Red-Blue Diverging, Red-Black Diverging, Gold-Purple Diverging, Red-Green-Gold Diverging, Sunrise-Sunset Diverging, Orange-Blue-White Diverging, Red-Green-White Diverging, Green-Blue-White Diverging, Red-Blue-White Diverging, Red-Black-White Diverging, Blue Light, Orange Light, Orange-Blue Light Diverging, Blue-Green Sequential, Temperature Diverging.The "Temperature Diverging" option is highlighted with a red box at the bottom of the list.
- Right Panel:** Shows various visualization examples and a note: "For a Gantt view try 1 date □ 1 or more Dimensions 0 to 2 Measures".
- Bottom:** Data Source (selected), Sheet 1, Sheet 2, and other navigation icons. Status bar: 4 marks, 1 row by 4 columns.

Step 12: SELECT FROM Multiple Tables

Tableau - Book1

File Data Server Window Help

Connections Add

doitsqlx.rhs...umd.edu,9703 Microsoft SQL Server

Database BUDT703_DB_Student_049

Table Product_T
ProductLine_T
RawMaterial_T
Salesperson_T
Skill_T
Supplies_T
Territory_T
Uses_T
Vendor_T
WorkCenter_T
Worksln_T
New Custom SQL
New Union

BUDT703_DB_Student_049

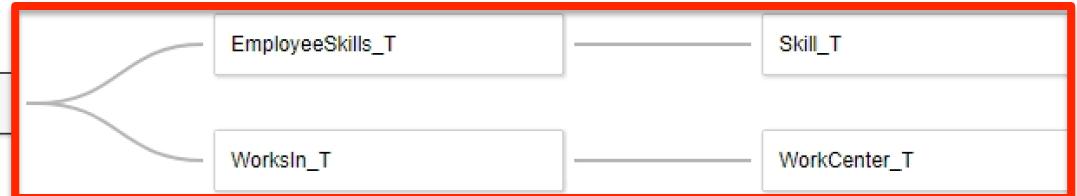
Employee_T EmployeeSkills_T Skill_T
Employee_T Worksln_T WorkCenter_T

Sort fields Data source order ▾ Show aliases Show hidden fields rows

Abc Employee_T Employee ID	Abc Employee_T Employee Name	Abc Employee_T Employee Address	Abc Employee_T Employee City	Abc Employee_T Employee State	Employee_T Employee Z
----------------------------	------------------------------	---------------------------------	------------------------------	-------------------------------	-----------------------

Update Now
Automatically Update

Data Source Sheet 1 Sheet 2 



Step 13: Highlighting Table

Tableau - Book1

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Data Analytics BUDT703_DB_Student...

Search

Tables

- Employee_T
 - Employee Address
 - Employee Birth Date
 - Employee City
 - Employee Date Hired
 - Employee ID
 - Employee Name
 - Employee State
 - Employee Supervisor
 - Employee Zip Code
 - Age Hired
 - # Employee_T(Count)
- EmployeeSkills_T
 - employeeID (EmployeeID)
 - Skill ID
 - # EmployeeSkills_T(Count)
- Skill_T
 - Skill Description
 - skillID (Skill T)
 - # Skill_T(Count)

Pages Columns Rows

Sheet 3

Skill Description

Work Center Location	10in Table	12in Band	Quality Control	Router	Upholster Cutter	Upholst Sewer
Null	1	1	1			1
Main Saw ..		1	1	1	1	
Tampa War..		1	1			1

Marks

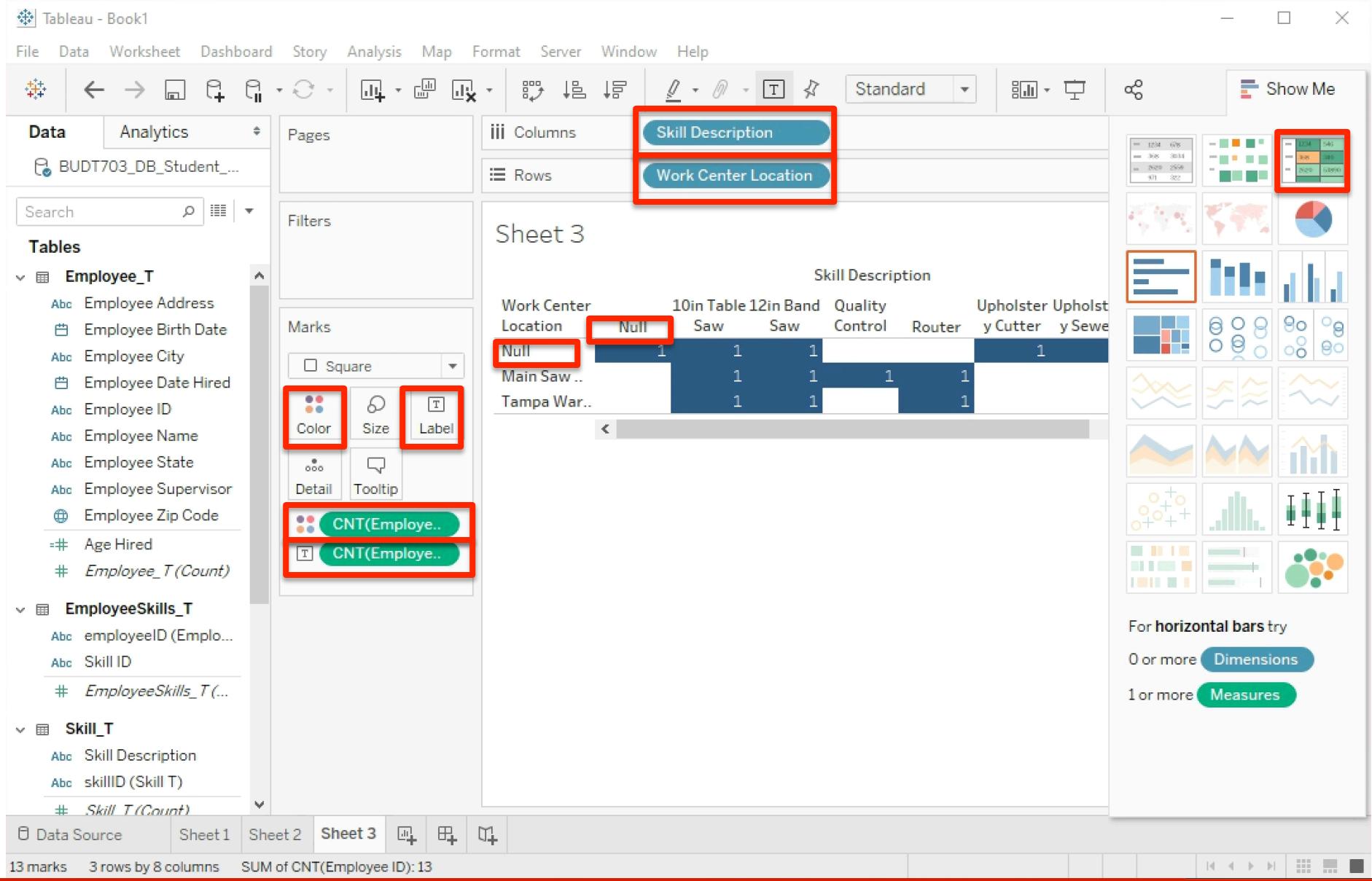
- Square
- Color
- Size
- Label
- Detail
- Tooltip

CNT(EmployeeID)
CNT(EmployeeID)

For horizontal bars try
0 or more Dimensions
1 or more Measures

Data Source Sheet 1 Sheet 2 Sheet 3   

13 marks 3 rows by 8 columns SUM of CNT(Employee ID): 13



The screenshot shows the Tableau desktop interface with a highlighted table visualization. The table has 'Work Center Location' as the primary dimension and various skills as measures. A red box highlights the 'Skill Description' and 'Work Center Location' headers. Another red box highlights the 'Null' value in the first row under 'Work Center Location'. A third red box highlights the 'Color' and 'Label' buttons in the Marks shelf. A fourth red box highlights two entries in the 'Label' dropdown: 'CNT(EmployeeID)' and 'CNT(Employee...)'.

Step 14: SELECT FROM More Tables

The screenshot shows the Tableau Data Source interface. On the left, the 'Connections' pane lists 'doitsqlx.rhs...umd.edu,9703 Microsoft SQL Server'. The 'Database' dropdown is set to 'BUDT703_DB_Student_049'. The 'Table' list on the left includes Customer_T, DoesBusinessIn_T, Employee_T, EmployeeSkills_T, Order_T, OrderLine_T, ProducedIn_T, Product_T, ProductLine_T, RawMaterial_T, Salesperson_T, New Custom SQL, and New Union. The main pane displays the database structure with tables WorkCenter_T, ProducedIn_T, and Product_T connected sequentially. A red box highlights this connection path. Below the tables are buttons for 'Sort fields', 'Data source order', 'Show aliases', 'Show hidden fields', and 'rows'. A preview of the 'ProducedIn_T' table is shown with columns: productID (Product_T), Product Line ID, Product Description, Product Finish, and Product Standard At the bottom, there are 'Update Now' and 'Automatically Update' buttons, and a toolbar with icons for Data Source, Sheet 1, Sheet 2, Sheet 3, and a plus sign.

Step 15: Column Chart

Tableau - Book1

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Data Analytics BUDT703_DB_Student...

Search

Tables

- Employee_T
 - Employee Address
 - Employee Birth Date
 - Employee City
 - Employee Date Hired
 - Employee ID
 - Employee Name
 - Employee State
 - Employee Supervisor
 - Employee Zip Code
 - Age Hired
 - # Employee_T(Count)
- EmployeeSkills_T
 - employeeID (EmployeeID)
 - Skill ID
 - # EmployeeSkills_T(Count)
- ProducedIn_T
 - Product ID
 - workCenterID (workCenterID)
 - # ProducedIn_T(Count)

Pages Columns Rows

Work Center Location / Product Description

Sheet 4

Work Center Location / Product Description

Ma N... in...	Tampa Warehouse	Warehouse and Receiving
3		
1		
0		

Count of Employee ID

4-Drawer Dresser 8-Drawer Dresser 48 Bookcase 96 Bookcase Birch Coffee Tables Cherry End Table Entertainment Center Nightstand Oak Computer Desk Writer's Desk 6' Grandfather Clock 7' Grandfather Clock Armoire High Back Leather Chair Pine End Table

Marks

- Automatic
- Color
- Size
- Label
- Detail
- Tooltip

Color Product Descri..

For horizontal bars try

0 or more Dimensions

1 or more Measures

17 marks 1 row by 17 columns SUM of CNT(Employee ID): 14

Step 16: Add New Dashboard

Tableau - Book1

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Data Analytics BUDT703_DB_Student...

Search

Tables

- Employee_T
 - Employee Address
 - Employee Birth Date
 - Employee City
 - Employee Date Hired
 - Employee ID
 - Employee Name
 - Employee State
 - Employee Supervisor
 - Employee Zip Code
 - Age Hired
 - # Employee_T(Count)
- EmployeeSkills_T
 - employeeID (Emplo...)
 - Skill ID
 - # EmployeeSkills_T(...)
- ProducedIn_T
 - Product ID
 - workCenterID (Prod...)
 - # ProducedIn_T(Cou...

Pages Columns Work Center Location Product Description

Rows CNT(Employee ID)

Marks Automatic Color Size Label Detail Tooltip Product Descri...

Sheet 4

Work Center Location / Product Description

Tampa Warehouse Warehouse and Receiving

Count of Employee ID

Product Description	Count of Employee ID
4-Drawer Dresser	1
6-Drawer Dresser	1
48 Bookcase	1
96 Bookcase	1
Birch Coffee Tables	1
Cherry End Table	1
Entertainment Center	1
Nightstand	1
Oak Computer Desk	1
Writer's Desk	1
6' Grandfather Clock	1
7' Grandfather Clock	1
Armoire	1
High Back Leather Chair	1
Pine End Table	1

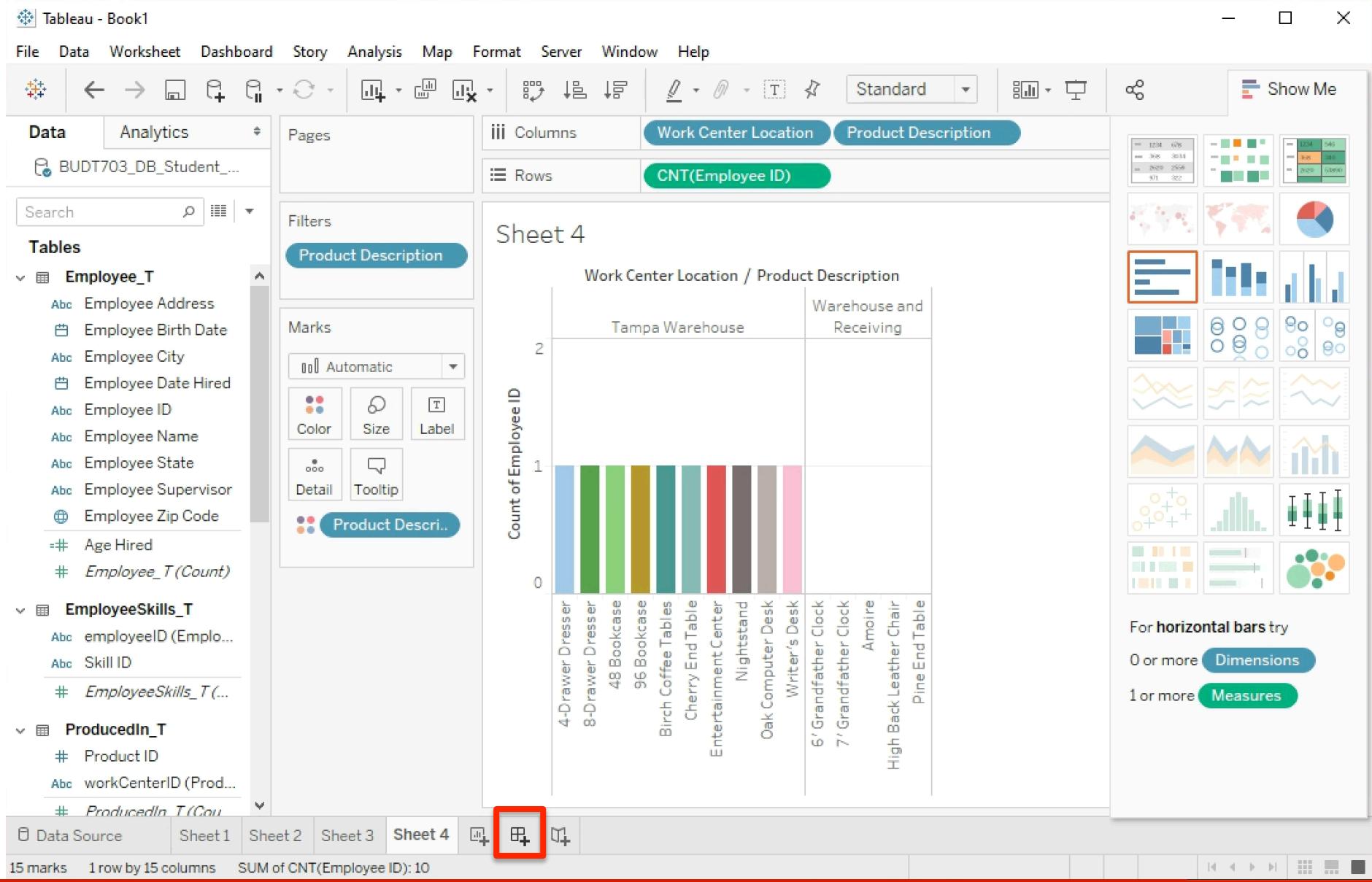
For horizontal bars try

0 or more Dimensions

1 or more Measures

Data Source Sheet 1 Sheet 2 Sheet 3 Sheet 4 

15 marks 1 row by 15 columns SUM of CNT(Employee ID): 10



Step 17: Dashboard from Four Worksheets

Tableau - Book1

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Dashboard Layout

Default Phone Device Preview

Size Custom size (860 x 540)

Sheets

- Sheet 1
- Sheet 2
- Sheet 3
- Sheet 4

Objects

- Horizontal
- Vertical
- Text
- Image
- Web Page

Tiled Floating

Sheet 1

Employee Ci..

City	Count of Employee ID
Clearwater	1
Knoxville	2
Nashville	2

Count of Employee ID

Sheet 2

Employee Name

Age Hired

Sheet 3

Skill Description

Work Center Location	10in Tab..	12in Ban..	Quality C..	Router
Main Saw Mill	1	1	1	1
Tampa Warehouse	1	1		1

Sheet 4

Work Center Location / Product Description

Location	Product Description	Count of Em.
Tampa Warehouse	4-Drawer Dresser	1
Warehouse and R..	6' Grandfather Clock	1
	7' Grandfather Clock	1
	8-Drawer Dresser	1
	48 Bookcase	1
	96 Bookcase	1
	Amoire	1
	Birch Coffee Tables	1
	Cherry End Table	1
	Entertainment Center	1
	High Back Leather Ch..	1
	Nightstand	1
	Oak Computer Desk	1
	Pine End Table	1
	Writer's Desk	1

Age Hired

Count of Employee ID

Product Description

- 4-Drawer Dresser
- 6' Grandfather Clock
- 7' Grandfather Clock
- 8-Drawer Dresser
- 48 Bookcase
- 96 Bookcase
- Amoire
- Birch Coffee Tables
- Cherry End Table
- Entertainment Center
- High Back Leather Ch..
- Nightstand
- Oak Computer Desk
- Pine End Table
- Writer's Desk

Data Source Sheet 1 Sheet 2 Sheet 3 Sheet 4 Dashboard 1

Step 18: Test Dashboard Filter

Tableau - Book1

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Dashboard Layout

Default Phone Device Preview

Size Custom size (860 x 540)

Sheets Sheet 1 Sheet 2 Sheet 3 Sheet 4

Objects Horizontal Blank Vertical Navigation Text Export Image Extension Web Page Tiled Floating

Age Hired 31 42

Count of Employee ID 2 1

Product Description 4-Drawer Dresser 8-Drawer Dresser 48 Bookcase 96 Bookcase Birch Coffee Tables Cherry End Table Entertainment Center Nightstand Oak Computer Desk Writer's Desk

Employee Ci.. Knoxville Count of Employee ID

Sheet 1

Employee Name Skill Description

Work Center Locat.. 10in Tab.. 12in Ban.. Router

Tampa Warehouse 1 1 1

Sheet 2

Age Hired

Employee Name

Work Center Location / Product Description

Tampa Warehouse

Count of Employee ID

Sheet 3

Sheet 4

Robert Lewis

Lee-703-Tbl

ROBERT H. SMITH SCHOOL OF BUSINESS

27

Step 19: Name Worksheets and Titles

Tableau Act8_Last_First

File Data Worksheet Dashboard Story Map Format Server Window Help

Show Me

Dashboard Layout

Default Phone Device Preview

Size Custom size (860 x 540)

Sheets

- Each City
- Age Hired
- Skill at Work ...
- Product at W...

Objects

- Horizontal
- Vertical
- Text
- Image
- Web Page
- Blank
- Navigation
- Export
- Extension

Tiled Floating

How many employees in each city?

Employee Ci..

City	Count of Employee ID
Clearwater	1
Knoxville	2
Nashville	2

Count of Employee ID

What are the employee name and age when each employee was hired?

Employee Name

Age Hired

Employee Name

Employee Name	Age Hired
Lawrence Haley	35
Mary Smith	30
Phil Morris	42
Robert Lewis	32

How many employees apply each skill at each work center?

Skill Description

Work Center Location / Product Description	10in Tab..	12in Ban..	Quality C.	Router
Main Saw Mill	1	1	1	1
Tampa Warehouse	1	1	1	1

How many employees work on each product produced at each work center?

Work Center Location / Product Description

Work Center Location / Product Description	Tampa Warehouse	Warehouse and R..
4-D...	1	0
8-D...	1	0
48 ..	1	0
96 ..	1	0
Bir...	1	0
Ch...	1	0
Ent...	1	0
Nig...	1	0
Oak ..	1	0
Wri...	1	0
6' ..	0	1
7' ..	0	1
Am ..	0	1
High...	0	1
Pine ..	0	1

Data Source

- Each City
- Age Hired
- Skill at Work Center
- Product at Work Center
- Employee Dashboard

How many employees in each city?

```
SELECT employeeCity, COUNT(employeeId) AS 'Number of  
Employees'  
FROM Employee_T  
GROUP BY employeeCity
```

	employeeCity	Number of Employees
1	Cleanwater	1
2	Knoxville	2
3	Nashville	2



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How many employees in each city?

Tableau - Book1

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Data Analytics BUDT703_DB_Student...

Search

Tables

- Employee_T
 - Employee Address
 - Employee Birth Date
 - Employee City
 - Employee Date Hired
 - Employee ID
 - Employee Name
 - Employee State
 - Employee Supervisor
 - Employee Zip Code
 - =# Age Hired
 - # Employee_T(Count)
- EmployeeSkills_T
 - employeeID (Emplo...)
 - Skill ID
 - # EmployeeSkills_T(...)
- ProducedIn_T
 - # Product ID
 - workCenterID (Prod...)
 - # ProducedIn(...)

Pages Columns CNT(Employee ID)

Rows Employee City

Filters

Marks Automatic Color Size Label Detail Tooltip

How many employees in each city?

Employee Ci..

Employee City	Count of Employee ID
Clearwater	1
Knoxville	2
Nashville	2

Count of Employee ID

Data Source Each City Sheet 2 Sheet 3 Sheet 4 Dashboard 1

3 marks 3 rows by 1 column SUM of CNT(Employee ID): 5



What are the employee name and age when each employee was hired?

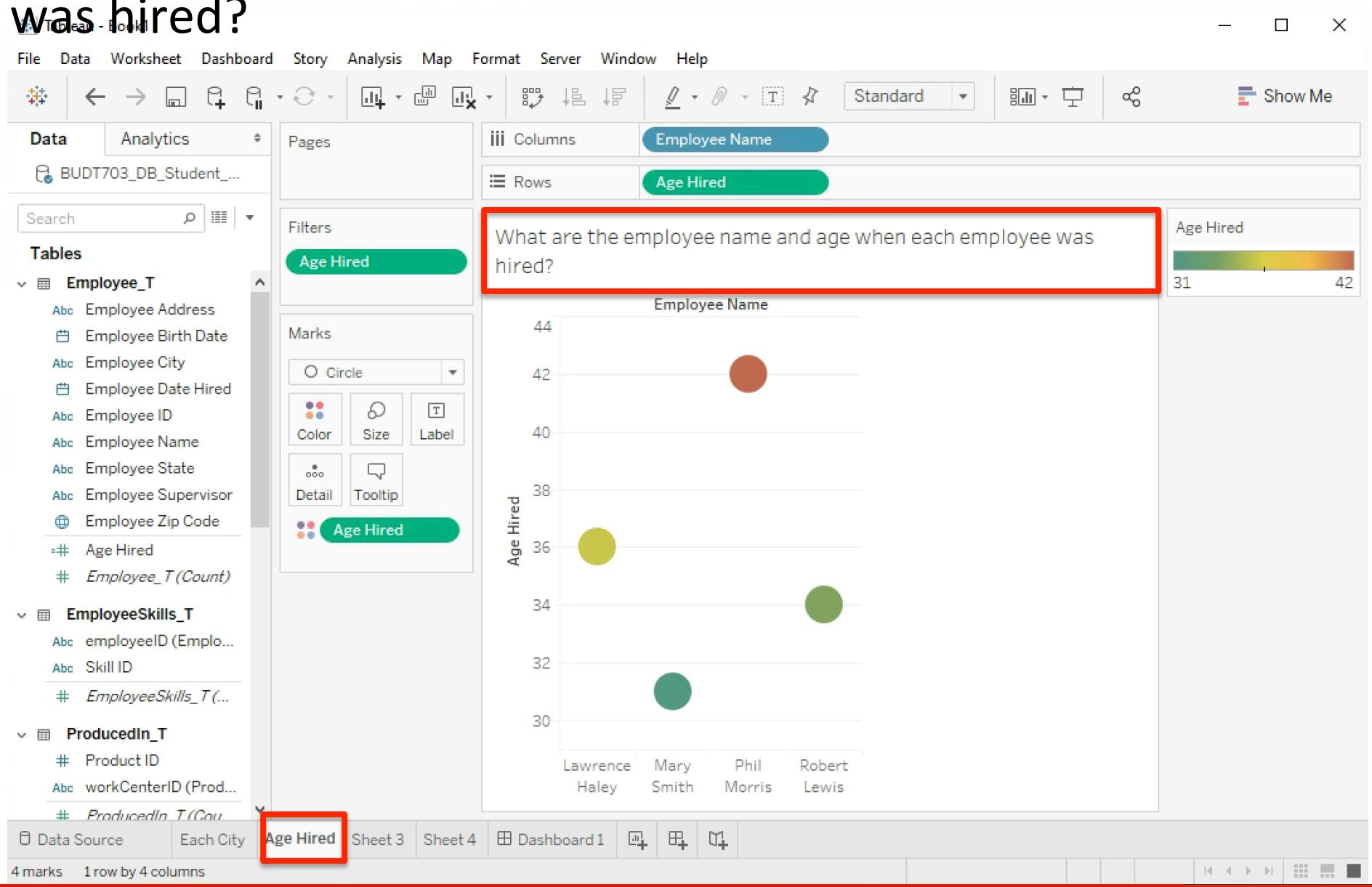
```
SELECT employeeName, DATEDIFF(YEAR,  
employeeBirthDate, employeeDateHired) AS 'Age Hired'  
FROM Employee_T  
WHERE employeeBirthDate IS NOT NULL
```

	employeeName	Age Hired
1	Phil Morris	42
2	Lawrence Haley	36
3	Robert Lewis	34
4	Mary Smith	31



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What are the employee name and age when each employee was hired?



How many employees apply each skill at each work center?

```
SELECT s.skillDescription, c.workCenterLocation,  
COUNT(DISTINCT e.employeeId) AS 'Number Of Employee'  
FROM Employee_T e, EmployeeSkills_T k, Skill_T s,  
WorksIn_T w, WorkCenter_T c  
WHERE e.employeeId = k.employeeId AND k.skillId = s.skillId  
AND e.employeeId = k.employeeId AND e.employeeId =  
w.employeeId AND w.workCenterId = c.workCenterId  
GROUP BY s.skillDescription, c.workCenterLocation
```

	skillDescription	workCenterLocation	Number Of Employee
1	10in Table Saw	Main Saw Mill	1
2	12in Band Saw	Main Saw Mill	1
3	Quality Control	Main Saw Mill	1
4	Router	Main Saw Mill	1
5	10in Table Saw	Tampa Warehouse	1
6	12in Band Saw	Tampa Warehouse	1
7	Router	Tampa Warehouse	1



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How many employees apply each skill at each work center?

The screenshot shows a Tableau interface with the following components:

- Top Bar:** File, Data, Worksheet, Dashboard, Story, Analysis, Map, Format, Server, Window, Help.
- Toolbars:** Standard, Show Me.
- Left Panel (Tables):**
 - Employee_T:** Employee Address, Employee Birth Date, Employee City, Employee Date Hired, Employee ID, Employee Name, Employee State, Employee Supervisor, Employee Zip Code, Age Hired, Employee_T(Count).
 - EmployeeSkills_T:** employeeID, Skill ID, EmployeeSkills_T(Count).
 - ProducedIn_T:** Product ID, workCenterID, ProducedIn_T(Count).
- Central View:**
 - Columns:** Skill Description (highlighted with a red box).
 - Rows:** Work Center Location (highlighted with a red box).
 - Text:** How many employees apply each skill at each work center? (highlighted with a red box).
 - Table:** A heatmap showing the count of employees applying skills at work centers. The columns are Work Center Location (Main Saw Mill, Tampa Warehouse) and Skill Description (10in Table, 12in Band, Quality, Router). The rows are Saw, Saw, Control, Router. The values are 1, 1, 1, 1 for Main Saw Mill; and 1, 1, 1, 1 for Tampa Warehouse.
 - Marks:** Square, Color, Size, Label, Detail, Tooltip.
 - Legend:** CNT(Employee ID), CNT(Employee ID).
- Bottom Navigation:** Data Source, Each City, Age Hired, Skill at Work Center (highlighted with a red box), Sheet 4, Dashboard 1, etc.
- Status Bar:** 7 marks, 2 rows by 4 columns, SUM of CNT(Employee ID): 7.

How many employees work on each product produced at each work center?

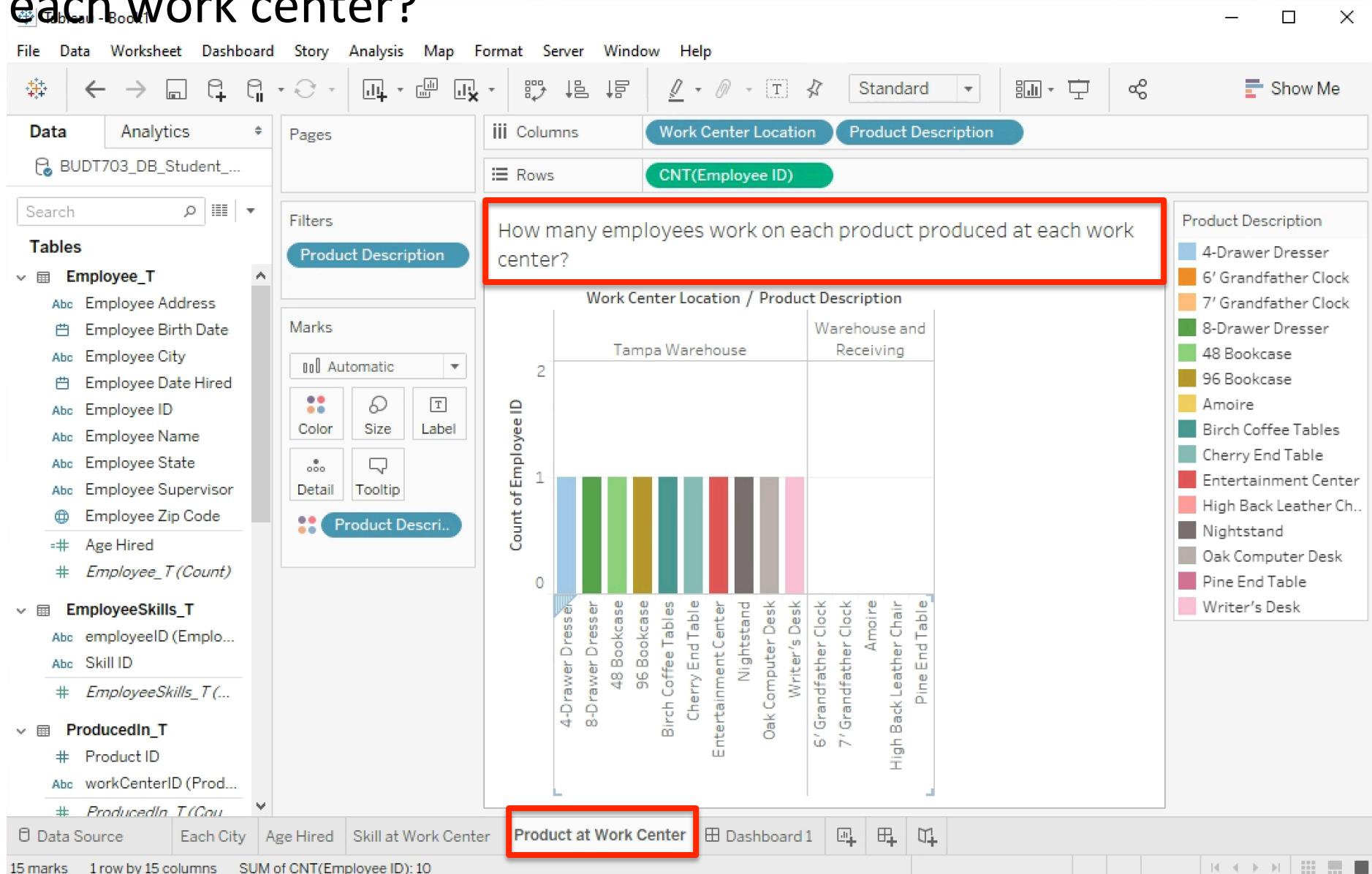
```
SELECT c.workCenterLocation, p.productDescription,  
COUNT(DISTINCT e.employeeId) AS 'Number Of Employee'  
FROM Employee_T e, WorksIn_T w, WorkCenter_T c,  
ProducedIn_T i, Product_T p  
WHERE e.employeeId = w.employeeId AND w.workCenterId  
= c.workCenterId AND c.workCenterId = i.workCenterId AND  
i.productId = p.productId  
GROUP BY c.workCenterLocation, p.productDescription
```

	workCenterLocation	productDescription	Number Of Employee
1	Tampa Warehouse	4-Drawer Dresser	1
2	Tampa Warehouse	48 Bookcase	1
3	Tampa Warehouse	8-Drawer Dresser	1
4	Tampa Warehouse	96 Bookcase	1
5	Tampa Warehouse	Birch Coffee Tables	1
6	Tampa Warehouse	Cherry End Table	1
7	Tampa Warehouse	Entertainment Center	1
8	Tampa Warehouse	Nightstand	1
9	Tampa Warehouse	Oak Computer Desk	1
10	Tampa Warehouse	Writer's Desk	1



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How many employees work on each product produced at each work center?



Outline

- Introduction to Tableau
- Tableau Desktop for Smith
- Access SQL Server Off-Campus



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Virtual Private Network (VPN)

- To access `doitsqlx.rhsmith.umd.edu`,`9703` from off-campus locations, your computer has to obtain a campus IP by using the University VPN.
- terpware.umd.edu
 - Select Network
 - Install Virtual Private Networking (VPN) client software



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