Quiz Questions

Hands-on Quiz 1

1. For items shipped in July of 2012, what percent of sales were sent in a Large Box?
2. Find the top product subcategories by Sales within each delivery method. The second highest subcategory for Regular Air sales is ranked #______ for Express Air.

3. In the furniture category, which unprofitable state is surrounded by only profitable states?

Hands-on Quiz 2
1) If 2013 Sales numbers were expected to increase by 10% in the following year in all customer segments, what would be the total estimated sales for Home Office in 2014?

2) Which product has the highest ship cost to sales ratio?

3) Find the customer with the highest profit. What is his or her average shipping cost per order?
[Hint: to calculate the shipping cost per order you will need to calculate the number of orders using the count distinct function]

Hands-on Quiz 3

1) Which product category has the largest interquartile range for sales?
- Furniture
- Office Supplies
- Technology

2) Which product sub-category has total sales which is $81,960 below the average sales per sub-category?

(First calculate the average sales per subcategory, then subtract this value from the sales broken out by sub-category)
- Paper
- Chairs & Chairmats
- Tables
- Office Furnishings

3) The top 5 customers by sales represent ____ of the total profits.
- 2.63%
- .55%
- 1.65%

Knowledge-based Quiz 1

1) A dimension is a field that typically holds
- numerical data
- discrete qualitative data

2) Dates are typically treated as
3) What word describes the area highlighted in light blue under the mouse cursor in the image below?

- group
- set
- hierarchy
- parameter
- measure

4) The icon next to a field means that field is

- numerical
- qualitative
- geographic
- date or time

**Knowledge Based Quiz 2**

1) Which of the following charts types always includes bars sorted in descending order?

- Gantt Chart
- Pareto Chart
- Combo Chart
- Bar in Bar

2) Which of the following charts uses binned data?
Pie Chart
Box Plot
Histogram
Bullet Graphs

3) If a field has a blue background, that means the field is
- continuous
- discrete
- dimension
- measure

4) When might you want to use a context filter?
- When you want to FIRST apply a filter and THEN show the Top N or Bottom N elements
- When you want to filter on a range of values rather than a single value
- When you want to FIRST show the Top N and Bottom N and THEN apply a filter
- When you want to filter on you data based on a secondary data source

5) This type level of detail expression computes total sales for the region, regardless of what dimensions are shown in the view.
- {SUM([Sales])}
- { FIXED [Region] : SUM([Sales]) }
- { ONLY [Region] : SUM([Sales]) }
- { EXACT [Region] : SUM([Sales]) }

**Forecasting**

1) Answer this question using the [Australia Labor Force data](#). Using Tableau's default monthly forecast, what is the predicted value for April 2014?
- 12,329
- 12,297
- 12,308
- 12,372

2) Answer this question using the [Australia Labor Force data](#). Using Tableau's default monthly forecast, what is the upper value for the 99% prediction interval for the April 2014 forecast?
Trendlines

1) Create a trend line for profit as a linear function of sales. What is the R^2 value?
   - 0.0738416
   - 0.138074
   - 0.147809

2) Create a trend line for profit as a linear function of sales. According to the trend line, how much does profit increase for each dollar of sales?
   - 0.142809
   - 0.966844
   - 155.864
   - 0.261169

3) Create a trend line for profit as a function of sales. Based on the R^2 value, which model type results in the best fit?
   - Linear
   - Exponential
   - Logarithmic
   - Polynomial with degree two

Data Manipulation Quiz

1) Find the total sales value for 2010 orders shipped with "Low" priority
   - 445,010
   - 310,095
   - 379,127

2) Which product has the highest total sales?
   - Hewlett Packard Laserjet 3310 Copier
3) There are four customer segments in the Superstore data set. What percent of the total profits are associated with the Small Business segment?

- 24.11%
- 21.63%
- 38.51%
- 15.74%

4) The row and column shelves contain these

- Grand Totals
- Pills
- Filters

5) Adding a dimension to the row or column shelf will filter your data.

- True
- False

6) Suppose that your data has a dimension called "Product Category," which has the values "Furniture," "Office Supplies," and "Technology." Which of the following should you use to combine Furniture and Office Supplies into a single category?

- Hierarchy
- Group
- Filter

**Calculations**

1) Find the total profit for the South region for items ordered in 2011.

- 52,889
- 54,889
- 55,335
- 11,775

2) Which product subcategory has the highest ratio of profit to sales?
3) Find the total number of Small Business customers placing orders from the superstore.

- 615
- 1,111
- 734
- 672

4) What is wrong with this If Statement

```sql
If [Sales] > 100 and "Delivery Truck" then 0 else [Shipping Cost] End
```

- Nothing, the syntax is correct
- Instead of "Delivery Truck" it should be [Shipping Mode] = "Delivery Truck"
- Instead of "Delivery Truck" it should be [Delivery Truck]

5) What will the function Left(3,"Tableau") return?

- Tab
- eau
- An error

**Joins and Blends**

1) Find the sale value for items ordered in 2012. Exclude the value of items which were returned.

- 2,158,725
- 72,006
- 1,843,186
- 8,630,660

2) All rows from both tables are returned in an INNER JOIN.
3) LEFT JOIN returns all rows from the left table, with the matching rows in the right table.

4) A LEFT JOIN or INNER JOIN creates a row each time the join criteria is satisfied, which can result in duplicate rows. One way to avoid this is to use data blending instead.

**Level of Detail**

1) What % of Customers ordering items in 2011 also ordered items in 2012? (use the customer ID to identify the customer)

- 49.289%
- 50.711%
- 59.71%
- 43.69%
- None of the above

2) How many customers (as identified by customer id) made 8 or 9 separate orders?

- 590
- 121
- 26
- 8
- 7

3) How much greater were the sales for the East region than for the South region?

- 1,597,346
- 942,995
- 825,458
- 794,093
- None of the above
None of the above

**Answers and Solutions**

**Hands-on Quiz 1**

1) For items shipped in July of 2012, what percent of sales were sent in a Large Box?

- [ ] 13.27%
- [ ] 11.46%
- [ ] 11.95%

Double-click on “Product Container” and “Sales” to add these to the view:

Filter on Ship Date = July 2012 by first drag “Ship Date” to the Filters card:
Select Month/Year, then select July 2012:

Once you do this you’ll see the sales for items shipped in July 2012 for each type of product container:

<table>
<thead>
<tr>
<th>Product Containers</th>
<th>Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jumbo Box</td>
<td>23.601</td>
</tr>
<tr>
<td>Jumbo Drum</td>
<td>66.161</td>
</tr>
<tr>
<td>Large Box</td>
<td>19.405</td>
</tr>
<tr>
<td>Medium Box</td>
<td>9.948</td>
</tr>
<tr>
<td>Small Box</td>
<td>36.540</td>
</tr>
<tr>
<td>Small Pack</td>
<td>5.240</td>
</tr>
<tr>
<td>Wrap Bag</td>
<td>1.450</td>
</tr>
</tbody>
</table>
Almost there – we just need to see percentages rather than the absolute sales. Click Sales, then Quick Table Calculation, and finally Percent of Total.

Once this is done we see 11.95% for Large Box:
2) Find the top product subcategories by Sales within each delivery method. The second highest subcategory for Regular Air sales is ranked #______ for Express Air.

Add Ship Mode, Product Sub-Category, and Sales to the view:

Now click on Sales in the Marks area, select “Quick Table Calculation” and then “Rank”
Finally, switch from Compute using Table (Accross) to Compute using Table (Down).

The #2 category for Regular Air is “Binders and Accessories.” This is #5 for Express Air.
3) In the furniture category, which unprofitable state is surrounded by only profitable states?

- Vermont
- Iowa
- Utah

Double click on “State or Province” and “Profit” to add to the view:

Filter on the Furniture product category:

Now drag “SUM(Profit)” to the color area on the Marks card:
In the furniture category, Vermont is surrounded by three profitable states: New York, Massachusetts, and New Hampshire.

**Hands-on Quiz 2**

1) If 2013 Sales numbers were expected to increase by 10% in the following year in all customer segments, what would be the total estimated sales for Home Office in 2014?

- 617,498
- 679,248
- 2,385,847

Create a new calculated field called 110% of Sales:
Drag Sales into the view and filter on Home Office:

Filter on Year of Order Date = 2013

Your view should looks like this:
Double-click the new field “110% of Sales” to add it to the view:

So we found the total sales for the Home Office segment in 2013 ($617,498) and then increased this value by 10% to get the 2014 projection.
2) Which product has the highest ship cost to sales ratio?

- Hoover® Commercial Lightweight Upright Vacuum
- Accohide Poly Flexible Ring Binders
- Kensington 7 Outlet MasterPiece Power Center with Fax/Phone Line Protection
- Lexmark 4227 Plus Dot Matrix Printer

Create a calculated field for ship cost to sales ratio.

```
sum([Shipping Cost])/sum([Sales])
```

The sums in the numerator and denominator ensure that we will calculate the total shipping cost divided by the total sales for the specified level of granularity in our view, rather than just calculating the shipping cost to sales ratio for each row in our data and then aggregating the result.

Add the new field and the “Product Name” field to the view:

Sort: Product Name descending by Ship Cost to Sales Ratio
We can now see the product with the highest ship cost to sales ratio:

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Ship Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hoover® Commercial Lightweight Upright Vacuum</td>
<td>1.782</td>
</tr>
<tr>
<td>Bravo II™ Megaboss® 12-Air Power Clean</td>
<td>0.347</td>
</tr>
<tr>
<td>Hoover Portapower™ Portable LITE</td>
<td>0.326</td>
</tr>
</tbody>
</table>

3) Find the customer with the highest profit. What is his or her average shipping cost per order?

[Hint: to calculate the shipping cost per order you will need to calculate the number of orders using the count distinct function]

☐ 66.72
☐ 10.49
☐ 12.59
☐ 12.18

Add Customer Name and Shipping Cost to the view, then sort by Shipping cost to see the customer with the highest profit:
Calculate the shipping cost per order by dividing the total shipping cost by the number of orders. The number of orders can be calculated using the count of the distinct order ids:

\[
\text{sum([Shipping Cost]) / countd([Order ID])}
\]

The calculation is valid.

Add this new field to the view:

**Hands-on Quiz 3**

1) Which product category has the largest interquartile range for sales?

- [ ] Furniture
- [ ] Office Supplies
- [ ] Technology

Add product category and sales to the view:
Switch to a box plot:

You are now a box and whisker plot based on the aggregated data:
Remove aggregation:

Mouse over to see the 1st and 3rd Quartiles:

IQR for Furniture = 1,804 – 167 = 1,637
IQR for Office Supplies = 283 – 39 = 244

IQR for technology = 1,505 – 207 = 1,298
2) Which product sub-category has total sales which is $81,960 below the average sales per sub-category?

(First calculate the average sales per subcategory, then subtract this value from the sales broken out by sub-category)

☐ Paper
☐ Chairs & Chairmats
☐ Tables
☒ Office Furnishings

Add subcategory and sales to the view.

Calculate the average total sales per subcategory by dividing the total sales by the total number of subcategories.

\[
\text{Avg Sales Per Sub-Category} = \frac{\text{total}(\text{sum}([Sales]))}{\text{total}(\text{count}([Product Sub-Category]))}
\]

The calculation is valid.
Add a calculation for the difference from the average sales per subcategory:

\[ \text{sum}([\text{Sales}]) - [\text{Avg Sales Per Sub-Category}] \]

The calculation is valid.

Sales for office furnishings are $81,960
3) The top 5 customers by sales represent ____ of the total profits.

- 2.63%
- .55%
- 1.65%

Create a set with the top 5 customers

Add the set to the view (by double-clicking) and then add profit to the view:
Click on Sum(Profit), then click Quick table calculation, and finally Percent of Total:

You should now see at the top 5 customers are responsible for 2.63% of total profit.

Knowledge-based Quiz 1

1) A dimension is a field that typically holds
   - numerical data
   - discrete qualitative data

When you first connect to a data source, Tableau assigns any fields that contain discrete categorical information (for example, fields where the values are strings or Boolean values) to the Dimensions area in the Data pane.
2) Dates are typically treated as
- dimensions
- measures

Dates and times are automatically placed in the **Dimensions** area of the Data pane.

3) What word describes the area highlighted in light blue under the mouse cursor in the image below?

- group
- set
- hierarchy
- parameter
- measure

![Image of Tableau interface](image_url)

- Is the symbol for a relational hierarchy

Click here for a page showing the meanings of the Tableau icons

Click here to see more on creating a hierarchy

4) The icon next to a field means that field is
- numerical
- qualitative
The icon indicates that the field contains geographical data and has been assigned a geographic role.

**Knowledge Based Quiz 2**

1) Which of the following charts types always includes bars sorted in descending order?
   - [ ] Gantt Chart
   - [ ] Pareto Chart
   - [ ] Combo Chart
   - [ ] Bar in Bar

A Pareto chart contains both bars and a line graph, where individual values are represented in descending order by bars, and the cumulative total is represented by the line. (definition from Wikipedia)

See Pareto charts in Tableau here.

2) Which of the following charts uses binned data?
   - [ ] Pie Chart
   - [ ] Box Plot
   - [ ] Histogram
   - [ ] Bullet Graphs

To construct a histogram, the first step is to "bin" the range of values—that is, divide the entire range of values into a series of intervals—and then count how many values fall into each interval. The bins are usually specified as consecutive, non-overlapping intervals of a variable. (source: Wikipedia)

Pie charts, box plots, and bullet graphs do not use binned data.

If you haven’t created a histogram in Tableau, check out this link to see how.

3) If a field has a blue background, that means the field is
   - [ ] continuous
   - [ ] discrete
   - [ ] dimension
If a field is continuous, the background color is green; if it is discrete, the background color is blue. Background color does not indicate dimension vs. measure—it indicates continuous vs. discrete.

This page discusses continuous and discrete field types.

4) When might you want to use a context filter?
- When you want to FIRST apply a filter and THEN show the Top N or Bottom N elements
- When you want to filter on a range of values rather than a single value
- When you want to FIRST show the Top N and Bottom N and THEN apply a filter
- When you want to filter on you data based on a secondary data source

This example shows how you can use a context filter first, and then find the Top N results for the filtered data.

5) This type level of detail expression computes total sales for the region, regardless of what dimensions are shown in the view.

- \{\text{SUM([Sales])}\}
- \{ \text{FIXED [Region]} : \text{SUM([Sales])} \}
- \{ \text{ONLY [Region]} : \text{SUM([Sales])} \}
- \{ \text{EXACT [Region]} : \text{SUM([Sales])} \}

FIXED level of detail expressions compute a value using the specified dimensions, without reference to the dimensions in the view.
So in this case, \{ \text{FIXED [Region]} : \text{SUM([Sales])} \} will find the sum of sales for the region, regardless of the view level of detail.

See this link for an explanation of FIXED level of detail expressions.

Also, see this link to understand how level of detail expressions interact with the view level of detail.

Forecasting

1) Answer this question using the Australia Labor Force data. Using Tableau's default monthly forecast, what is the predicted value for April 2014?
- 12,329
Add year and value to the view:

Switch from YEAR(Date) to the month / year view:

Switch to line graph:
Switch to the analytics tab and double-click forecast:

Mouse over to see the forecast:
2) Answer this question using the Australia Labor Force data. Using Tableau's default monthly forecast, what is the upper value for the 99% prediction interval for the April 2014 forecast?

- 12,221.9
- 12,297
- 12,372.9
- 12,354.8

Right-click on Forecast then select Forecast Options:

Change to the 99% prediction interval:

Add value to the marks card:
Click on Sum, then Forecast Result, then Upper Prediction Interval

Mouse over April 2014 and you’ll now see the upper value for the 99% prediction interval

**Trendlines**

1) Create a trend line for profit as a linear function of sales. What is the \( R^2 \) value?

\[ 0.0738416 \]
Double click on profit and sales to add both to your view:

Disaggregate:

One “Aggregate measures” is unchecked, the graph should now look like this:
Right-click on the graph, select Trendlines and then Show Trend Line:

Mouse over the trend line to see the R-squared value.
2) Create a trend line for profit as a linear function of sales. According to the trend line, how much does profit increase for each dollar of sales?

- 0.142809
- 0.966844
- 155.864
- 0.261169

Looking at the screenshot above, we see the formula for the trendline is:

\[
\text{Profit} = 0.142809 \times \text{Sales} + 3.60978
\]

This means that for every one dollar of sales, profit increases by 0.142809 dollars (in other words, about 15 cents).

3) Create a trend line for profit as a function of sales. Based on the R^2 value, which model type results in the best fit?

- Linear
- Exponential
- Logarithmic
- Polynomial with degree two

Right click and select Edit Trendline to change the model type.
Switch from a Linear to Logarithmic, Exponential, and Polynomial Degree 2.

Logarithmic has an R-squared value of .0738416:

Polynomial degree 2 has an R-squared of .156299. This is the highest R-squared, hence the this model can be considered the best fit.
Data Manipulation Quiz

1) Find the total sales value for 2010 orders shipped with "Low" priority

- 445,010
- 310,095
- 379,127

Add sales to the view and filter on order date = 2010:

Select Years
Select 2010:

Drag Order Priority to the Columns shelf:
Mouse over Low to find the total Sales for 2010 orders with Low Priority:

2) Which product has the highest total sales?
   - Hewlett Packard Laserjet 3310 Copier
   - Canon PC940 Copier
   - Global Troy Executive Leather Executive Low-Back Tilter
   - Luxo Professional Fluorescent Magnifier Lamp with Clamp-Base Mount

Add Sales and Product Name to the view:
Switch to a table view:

Sort descending by sales:

Highest total sales for the Global Troy Executive Leather Low-Back Tilter
3) There are four customer segments in the Superstore data set. What percent of the total profits are associated with the Small Business segment?

- 24.11%
- 21.63%
- 38.51%
- 15.74%

Double-click customer segment and sales to add them to the view:

Click on SUM(Profit), then Quick table calculation, then Percent of Total

4) The row and column shelves contain these
When you drag a dimension or measure to the row or column shelves, headers or axes are added to the view. Dimensions appear as a blue pill on the column shelf, while measures appear as green pills.

More here: https://www.interworks.com/blog/skennedy/2014/05/01/tableau-terminology-101-pills-shelves-and-dashboards-oh-my

5) Adding a dimension to the row or column shelf will filter your data.

- True
- False

Adding a dimension to the row or column shelf will increase the granularity of your view, but it will not filter. To filter, drag a dimension or measure to the filter shelf.


6) Suppose that your data has a dimension called "Product Category," which has the values "Furniture," "Office Supplies," and "Technology." Which of the following should you use to combine Furniture and Office Supplies into a single category?

- Hierarchy
- Group
- Filter

A group is a combination of dimension members that make higher level categories. For example, “Office Supplies” and “Furniture” are both members of “Product Category,” so we can use a group to combine them to make “Office Supplies and Furniture.”

Step 1: Create Group
Step 2: Highlight Office Supplies and Technology. Then Click Group.

Step 3: Click Apply
Step 4: Add Product Category (group) to the view:

Calculations

1) Find the total profit for the South region for items ordered in 2011.

- 52,889
- 54,889
- 55,335
- 11,775

Add Profit, Region, and Order Date to the view:
2) Which product subcategory has the highest ratio of profit to sales?

- Binders and Binder Accessories
- Envelopes
- Labels
- Pens & Art Supplies
- None of the Above

Create a calculated field called Profit to Sales Ratio:

```
Profit to Sales Ratio

sum([Profit])/sum([Sales])
```

Notice we are dividing the sum of the profit by the sum of the sales. If we did simply [Profit]/[Sales] we would calculate the profit to sales ratio for each row of data, but each row would be weighted equally when we aggregate. We don’t want that, rather we’d like to divide the total profit by the total sales for each product category.
Add the product sub-category and the new calculated field to the view:

![Product Sub-Category](image)

Sort or just visually inspect to see that Labels have the best sales to profit ratio.

3) Find the total number of Small Business customers placing orders from the superstore.

- 615
- 1,111
- 734
- 672

Create a calculated field for distinct customers

```plaintext
Customer Count
COUNTID([Customer ID])
```

The calculation is valid.

Double click on the new field and Customer Segment to add both to the view:
4) What is wrong with this If Statement

If \([\text{Sales}] > 100\) and "Delivery Truck" then 0 else [Shipping Cost] End

- Nothing, the syntax is correct
- Instead of "Delivery Truck" it should be \([\text{Shipping Mode}] = \text{"Delivery Truck"}\)
- Instead of "Delivery Truck" it should be [Delivery Truck]

5) What will the function \(\text{Left}(3, \text{"Tableau"})\) return?

- Tab
- eau
- An error

The function \(\text{Left}\) has the following syntax: \(\text{Left}(\text{string, num\_chars})\). So it should be \(\text{Left}(\text{"Tableau"}, 3)\) rather than \(\text{Left}(3, \text{"Tableau"})\)

**Joins and Blends**

1) Find the sale value for items ordered in 2012. Exclude the value of items which were returned.

- 2,158,725
Drag the Returns data into the data join area:
Select Left to do a left join. This will include all values from the Orders table and all Order ID matches with the right table.

Scroll right in the data preview area. You should see that Order ID (Returns) is generally null, meaning there is no record for the order in the returns data set. In these cases the order was not returned. When the Order ID (Returns) is populated you will see the Status = Returned.

Add Sales and Order Date to the view:

Filter on Status=Null to filter out the Returned items.
Mouse over 2012 to see the sales for that year:

2) All rows from both tables are returned in an INNER JOIN.
   - True
   - False

   An inner join includes only values with matches in both tables. A full outer join will include all rows in both tables.

3) LEFT JOIN returns all rows from the left table, with the matching rows in the right table.
   - True
   - False

   The description of a left join is shown here:

4) A LEFT JOIN or INNER JOIN creates a row each time the join criteria is satisfied, which can result in duplicate rows. One way to avoid this is to use data blending instead.
   - True
   - False
For a detailed explanation of how joins produce duplicate rows and how blending can be used to avoid duplication, please take a look at the following article:


**Level of Detail**

1. What % of Customers ordering items in 2011 also ordered items in 2012? (use the customer ID to identify the customer)

   A. 49.289%
   B. 50.711%
   C. 59.71%
   **D. 43.69%**
   E. None of the above

Use a LOD expression to determine whether the customer ordered in 2012:

Filter on 2011 orders:
Add a count distinct calculation for the number of customers:

```
Number of customers
```

\( \text{countd}([\text{Customer ID}]) \)

The calculation is valid.

Now we have the customers ordering in 2011, and whether or not they ordered in 2012:
2. How many customers (as identified by customer id) made 8 or 9 separate orders?
   A. 590
Add a formula to

\{\text{Fixed} \ [\text{Customer ID}] : \text{COUNTD}(\text{[Order ID]})\}

The calculation is valid.

Add this to the view and change to a histogram:

Check the bin size:
Look at the 8 – 10 bin:

3. How much greater were the sales for the East region than for the South region?
   A. 1,597,346
   B. 942,995
   C. **825,458**
   D. 794,093
   E. None of the above
Add Region, Sales and Sales for South to the view:

\{\text{sum(\text{if [Region]="South" then [Sales] else 0 end})}\}

This is almost what we need. Let’s just take the difference of Sales and Sales for South:
Add this to the view:

**Sheet 11**

<table>
<thead>
<tr>
<th>Region</th>
<th>Sales</th>
<th>Sales for South</th>
<th>Sales - Sales for South</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>2,540,242</td>
<td>1,597,346</td>
<td>942,996</td>
</tr>
<tr>
<td>East</td>
<td>2,422,868</td>
<td>1,597,346</td>
<td>825,522</td>
</tr>
<tr>
<td>South</td>
<td>1,597,346</td>
<td>1,597,346</td>
<td>0</td>
</tr>
<tr>
<td>West</td>
<td>2,391,439</td>
<td>1,597,346</td>
<td>794,093</td>
</tr>
</tbody>
</table>

The calculation is valid.