# Vis Exercise 03 Introduction to Tableau II

Temporal Data, Interactive Timelines, and Parameters

CS5044 – Information Visualization



### loading the data

- Load the migration data from StudRes/Tutorials – Tableau/data/migration\_withCode\_all\_noTotal.csv
- Open Tableau and load the data as "Text File"



Microsoft SQL Server MySQL Amazon Redshift More.

Sample - Superstore World Indicators

#### Open



Superstore

#### Sample Workbooks



Superstore



#### what we will cover

- Building a simple timeline
  - Manipulating data to work in a temporal way
- Creating an interactive slider to filter the timeline
- Working with Dashboard Actions
- Working with parameters for more interactivity

building a simple timeline

### manipulating the data

• Note this data contains temporal data, but the values are in a strange format.

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## manipulating the data

- We want to treat the data as temporal data.
- So we change the data type to "Date".
- This format now looks more like a familiar time format.



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# building a timeline

- Drag the "Year" attribute (ordered) into the Columns pane.
- Drag the "Value" attribute (quantitative) into the Rows pane.
- Tableau will automatically generate a line chart.

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# building a timeline

- Note that Tableau recognizes the Year attribute as hierarchical – it can be split into ĭ / ▼ Ø → T ⊀
  - Quarter
  - Month
  - Day
- Just press the + button





MONTH(Time)



• The disconnected lines in the line graph are because the temporal attributes are treated as discrete data.





- We can fix this, by making "Year" a continuous dimension.
- Remove the discrete "Year" and "Month" attributes from the Columns pane and rebuild your line graph.



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### stylizing x-axis

- Change labels and their alignment on the x-axis.
  - Right-click the x-axis and select "Format"
  - Change alignment to vertical alignment
  - You can also add ticks to the timeline for better readibility

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#### timeline



linking timeline to map

#### some geographic data

- Build another worksheet with a geographic map that shows the total number of immigrants into Europe.
- If you don't know how to do this, check Tableau tutorial 01.
- Here, we have applied transparency to the circles on the map, to better deal with potential overlaps.





#### create a dashboard

- Create a dashboard juxtaposing the timeline and map.
- If you don't know how to do this, check Tableau tutorial 01.
- Note that you can set the size of the dashboard by in the left panel under "size"
- Make sure that the views are aligned and sized so that important. features are visible. E.g., the timeline should not be too flat as trends will not be visible.





- Let's make the timeline interactive to allow "zooming" into particular years.
- One option would be to apply a filter by year.
- Go to the timeline worksheet and create such a filter.
- If you don't know how to do this, check Tableau tutorial 01.
- This would give you a check-box filter where individual years can be selected.

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 We can also create a continuous filter, by treating year, as an attribute with continuous values.

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- Go back to the dashboard and connect the time slider filter (which will only apply to the timeline) also to the map.
- If you don't know how to do this, check Tableau tutorial 01.
- You will find the slider difficult to use, as it is relatively small and it is hard to select time ranges accurately.





- Arranging the filter below the timeline, provides more space for interaction and, at the same time, the timeline can act as an reference to values connected to the selected time range.
- Outer padding can be applied to the timeline worksheet in order to align the timeline axis and the timeline filter





- The current timeline slider can only select years. To make it more fine-grained, you can change its option in the timeline worksheet.
- Update the filter in your dashboard.



#### Map









D November 2015

customizing dashboard interactivity

# dashboard actions

- Right now, clicking on countries in your map changes the timeline.
- Let's change this to a hover interaction.







### dashboard actions

- In the menu click on "Dashboard" and then "Actions".
- The "Action" settings will come up.
- We already have one filter action here that connects the map to the timeline.



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### dashboard actions

- Click "Edit" to modify this filter.
- Currently the filtering works upon mouseclick "Select".
- Let's change this to a "Hover" and click "ok".

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parameters in Tableau

#### parameters in Tableau

- Allow for more customised interactivity in your visualisations
  - Help implement if-then scenarios, e.g., to allow the user to flip between views of different attributes.
- Important points to remember
  - Parameters should be used as part of calculations to be useful
  - The parameter control should be displayed so that the user can interact with it.
- Useful information
  - https://onlinehelp.tableau.com/current/pro/desktop/en-us/changing-views-using-parameters.htm
  - https://www.tableau.com/learn/tutorials/on-demand/parameters

#### example use of parameters

- In the data set we have two interesting attributes
  - Destination countries of immigrants
  - Immigrants' countries of origin
- Let's create a parameter and corresponding calculated field to allow the user to flip between the two.

#### creating a parameter

- Go to your map visualisation worksheet
- Above the "Dimensions" pane, select the drop-down menu to create a "Create Parameters..."



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#### creating a parameter

- Give the parameter a meaningful name that matches its purpose, for example:
  - "origin or destination"
- Let's configure the parameter.
- We leave the data type at "float"
- We want to manipulate the list of allowable values, so we select "List"
- Here we set parameter options
  - 1 for "Country of Origin"
  - 2 for "Country of Destination"
- Click "ok"



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#### creating a parameter

- Our new parameter is now visible to the left under "Dimensions" and "Measures"
- We can now use this parameter for simple "if" statement:

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#### using parameters in calculated fields

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#### using parameters in calculated fields

- Give the calculated field a meaningful name such as "p. Choice of map attribute".
- We use "p." here to indicate that the calculated field makes use of parameters.
- The calculated field will contain a simple if statement to switch between the "GEO" (destination) and "Citizen" (origin) attributes upon user interaction.
- Click "ok"



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# using parameters in calculated fields

- We now see our new calculated filed in the "Dimensions" pane.
- Delete the "GEO" attribute from the Marks pane and insert the new parameter-based calculated field.

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#### not there yet

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   see any results yet, as the map
   requires a geographic data type
- p. Choice of map attribute is currently a "String"
- Covert the calculated field into a geographic attribute (see next slide)



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## convert calculated field to geographic data type



## with country of origin selected...



## with country of destination selected...



### make sure the title of the map changes with the parameter option

- Double click the title of the worksheet
- Select "Insert"
- Select the parameter
- Click apply
- The title of your worksheet should now change with the selection of the parameter radio button.

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# insert the new parameter-based map into your dashboard

- Style the parameter option element as you like.
  - Radio button
  - Drop-down menu



#### activities

- Apply the "origin or destination" parameter to change the colour of circles in the map depending on the selected option.
- For "origin" the circles should be blue
- For "destination" the circles should be orange
- Bring comparisons of gender ("SEX") into your visualisation dashboard
  - Experiment with area charts
- Try and support a side-by-side comparison of destination countries and countries of origin.

#### more resources on timelines in Tableau

How to make a timeline in Tableau, Ryan Sleeper 



- https://www.ryansleeper.com/how-to-make-a-timeline-in-tableau/
- Making timeline charts in Tablea step-by-step
  - https://umarthejourno.com/2017/03/02/making-timeline-charts-in-tableau-step-by-step/



- Creating a Gantt Chart
  - http://onlinehelp.tableau.com/current/pro/desktop/en-us/buildexamples\_gantt.html

Binders	First Class
	Same Day
	Second Class
	Standard Class



