MIS771 Descriptive Analytics and Visualisation

Topic 9 Tutorial - Dashboard Sample

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Introduction

This week's tutorial provides an introduction to basic Dashboard development. Using the Tableau Data Visualisation tool the tutorial will explain, how to setup individual worksheets, how to add and arrange worksheets on a dashboard, and how to enhance dashboard interaction by applying filters. You will also practice adding a Hyperlink to an external website.

Specifically, the aims of this tutorial are to:

- understand the basic elements of a dashboard
- understand the role of filers (local and global)
- apply basic design principles (unity, variety, hierarchy)

1. Scenario

This week we will explore a Hollywood movie data set, which was developed as part of the 2012 Information is Beautiful challenge.

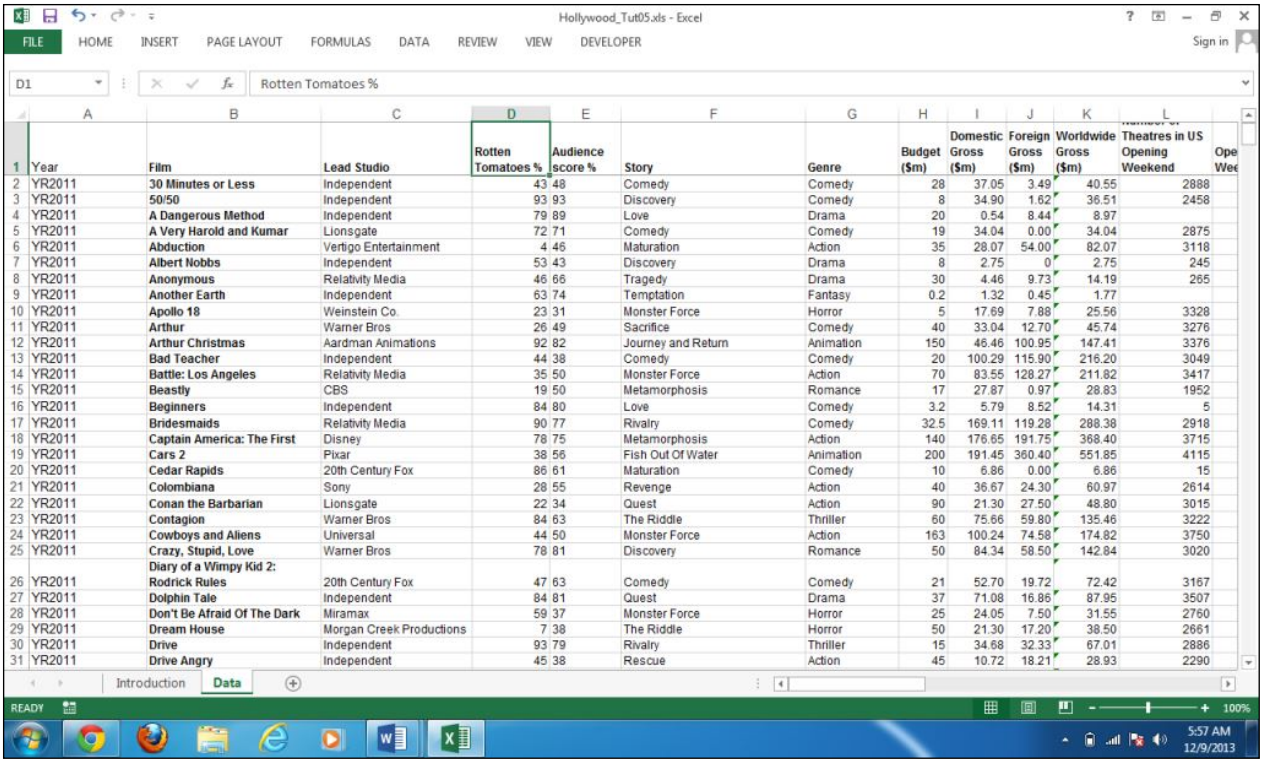
The Hollywood movie data set provides details on nearly 700 movies that were release in the US between the years of 2007 and 2011. Each record in the data set relates to a specific movie and consists of 17 attributes ranging from, the year the movie was released, the movie's genre, the movie's Rotten Tomato popularity score, and a number of facts about the movie's cost and box office earnings. The data set was put together by David McCandless, with the assistance of Miriam Quick, Marley Whiteside, Dan Hampson, Pearl Doughty-White, Matt Hanock, Alexia Wdoswki.

The main aim of today's tutorial is to see how combining a series of simple charts in to an interactive dashboard can quickly establish a fun and useful tool for exploring a data set.

2. Open the data file in Excel

First we need to download our sample data set for this Tutorial and open the data in Excel.

a) Download the file Hollywood_Tut02.xls from the Unit Resources on Cloud Deakin. Save it to your hard drive (or your working disk if working on one of the Deakin lab computers).
b) Open the Hollywood_Tut02.xls file in Excel.



	A	B	C	D	E	F	G	H	I	J	K	L	
1	Year	Film	Lead Studio	Rotten Tomatoes %	Audience score %	Story	Genre	Budget ($m)	Domestic Gross ($m)	Foreign Gross ($m)	Worldwide Gross ($m)	Theatres in US Opening Weekend	Ope Wee
2	YR2011	30 Minutes or Less	Independent	43	48	Comedy	Comedy	28	37.05	3.49	40.55	2888	
3	YR2011	50/50	Independent	93	93	Discovery	Comedy	8	34.90	1.62	36.51	2458	
4	YR2011	A Dangerous Method	Independent	79	89	Love	Drama	20	0.54	8.44	8.97		
5	YR2011	A Very Harold and Kumar	Lionsgate	72	71	Comedy	Comedy	19	34.04	0.00	34.04	2875	
6	YR2011	Abduction	Vertigo Entertainment	4	46	Maturation	Action	35	28.07	54.00	82.07	3118	
7	YR2011	Albert Nobbs	Independent	53	43	Discovery	Drama	8	2.75	0	2.75	245	
8	YR2011	Anonymous	Relativity Media	46	66	Tragedy	Drama	30	4.46	9.73	14.19	265	
9	YR2011	Another Earth	Independent	63	74	Temptation	Fantasy	0.2	1.32	0.45	1.77		
10	YR2011	Apollo 18	Weinstein Co.	23	31	Monster Force	Horror	5	17.69	7.88	25.56	3328	
11	YR2011	Arthur	Warner Bros	26	49	Sacrifice	Comedy	40	33.04	12.70	45.74	3276	
12	YR2011	Arthur Christmas	Aardman Animations	92	82	Journey and Return	Animation	150	46.46	100.95	147.41	3376	
13	YR2011	Bad Teacher	Independent	44	38	Comedy	Comedy	20	100.29	115.90	216.20	3049	
14	YR2011	Battle: Los Angeles	Relativity Media	35	50	Monster Force	Action	70	83.55	128.27	211.82	3417	
15	YR2011	Beastly	CBS	19	50	Metamorphosis	Romance	17	27.87	0.97	28.83	1952	
16	YR2011	Beginners	Independent	84	80	Love	Comedy	3.2	5.79	8.52	14.31	5	
17	YR2011	Bridesmaids	Relativity Media	90	77	Rivalry	Comedy	32.5	169.11	119.28	288.38	2918	
18	YR2011	Captain America: The First	Disney	78	75	Metamorphosis	Action	140	176.65	191.75	368.40	3715	
19	YR2011	Cars 2	Pixar	38	56	Fish Out Of Water	Animation	200	191.45	360.40	551.85	4115	
20	YR2011	Cedar Rapids	20th Century Fox	86	61	Maturation	Comedy	10	6.86	0.00	6.86	15	
21	YR2011	Colombiana	Sony	28	55	Revenge	Action	40	36.67	24.30	60.97	2614	
22	YR2011	Conan the Barbarian	Lionsgate	22	34	Quest	Action	90	21.30	27.50	48.80	3015	
23	YR2011	Contagion	Warner Bros	84	63	The Riddle	Thriller	60	75.66	59.80	135.46	3222	
24	YR2011	Cowboys and Aliens	Universal	44	50	Monster Force	Action	163	100.24	74.58	174.82	3750	
25	YR2011	Crazy, Stupid, Love	Warner Bros	78	81	Discovery	Romance	50	84.34	58.50	142.84	3020	
26	YR2011	Diary of a Wimpy Kid 2: Rodrick Rules	20th Century Fox	47	63	Comedy	Comedy	21	52.70	19.72	72.42	3167	
27	YR2011	Dolphin Tale	Independent	84	81	Quest	Drama	37	71.08	16.86	87.95	3507	
28	YR2011	Don't Be Afraid Of The Dark	Miramax	59	37	Monster Force	Horror	25	24.05	7.50	31.55	2760	
29	YR2011	Dream House	Morgan Creek Productions	7	38	The Riddle	Horror	50	21.30	17.20	38.50	2661	
30	YR2011	Drive	Independent	93	79	Rivalry	Thriller	15	34.68	32.33	67.01	2886	
31	YR2011	Drive Angry	Independent	45	38	Rescue	Action	45	10.72	18.21	28.93	2290	

Figure 1: The Hollywood_Tut02.xls file, opened in Excel

3. What structure can you see in that data?

As we did in our previous tutorial, before we can begin any type of analysis on the Hollywood movie data we first need to understand the basic structure of the data and understand how the data is organised.

In previous tutorials you have been shown the difference between Categorical and Continuous data. In this step we will first identify the different types of Categorical and Continuous data available in the tutorial data set.

a) What different groups of data are there in the Data Set, and what are the labels/names for each of the Categorical data?
b) What are the labels/names for the Continuous data?
c) How many records are there in the Data Set?
d) Can you seen any of your favourite movies in the list?

Categorical Data usually can take on one of a limited, and usually fixed, number of possible values, and is typically used to describe or group related data. Continuous data is usually Numeric and many take on any value with a range.

4. Who is your audience?

Before we launch the Tableau software and build our dashboard, we should first define who we think will be the audience for the dashboard and what information they are looking to explore and what insights they would like to gain.

In this exercise we will define an example Persona by filling out the 'Persona Profile' worksheet in the Hollywood_Tut02.xls Excel file (see Figure 2 for an example).

In Data Visualisation and user-centered design, personas are fictional characters created to represent the different user types within a targeted demographic, attitude and/or behaviour set that might use a Dashboard or other Data Visualisation.

- Who are they?
- What is their skill level using Data Visualisations?
- What questions would they like to answer?
- What action are you supporting?
- What experience would you like to give them (Fun, Professional, Scientific)

By defining one or more Personas before you begin your dashboard design, you'll be able to focus on building functionality that best supports your audience by putting the user at the centre of your experience. The Personas will also provide the basis for Testing and Design Critique after you are done with your first iteration of your design.

Figure 2: Simplified Persona Profile

5. Launch Tableau and connect to our data.

In these basic steps we will start Tableau and connect to the Hollywood data set using the Tableau Software. These are the same basic steps you took at the beginning of the last Tutorial, only this time we will connect to the Hollywood_Tut02.xls file.

a) First start the Tableau software, just like any other software (access from the Windows Start menu)… Note: If you haven't already you can download a trail version of Tableau from http://www.tableau.com/ and use the Product Activation Key provided on Cloud Deakin.

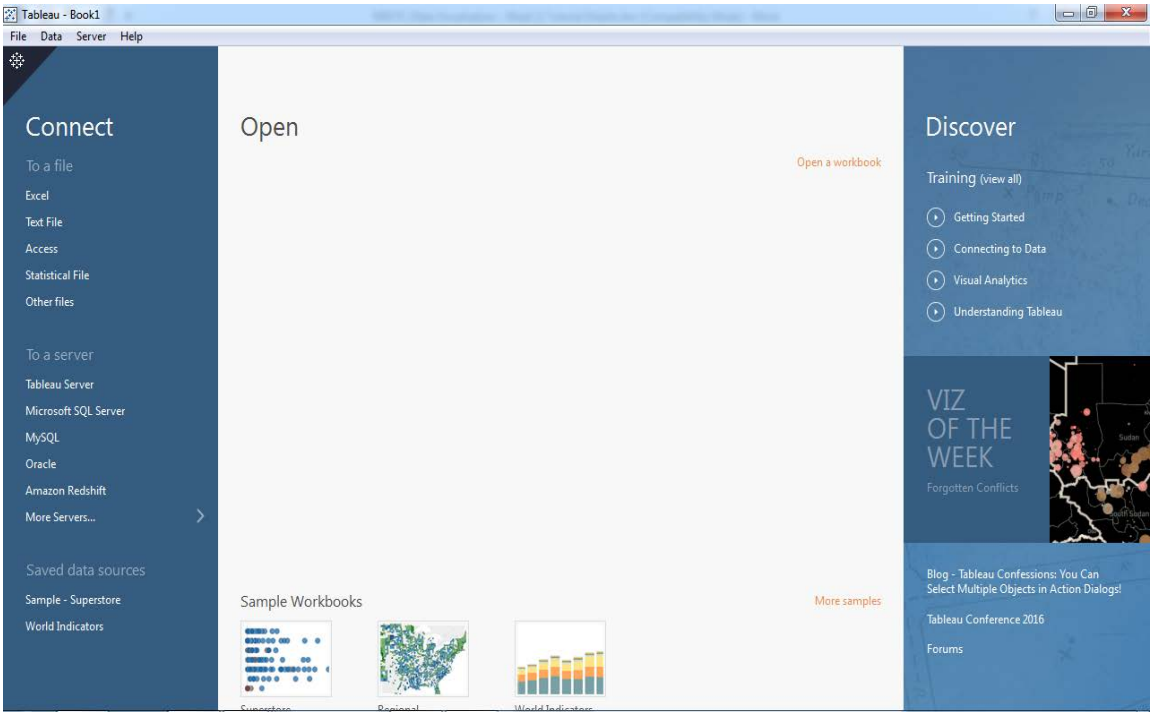


Figure 3: The Tableau software opening screen (version 9.3 shown)

If you are using the Deakin Lab computers the Tableau software will already be installed. If you are working through the tutorial on your personal computer you will need to first install the Tableau using the instructions and software key provided in the MIS771 discussion forum.

b) Next use the 'Connect' feature in the left panel to open the Hollywood_Tut02.xls in Tableau.

Step 1. 'Select Excel'

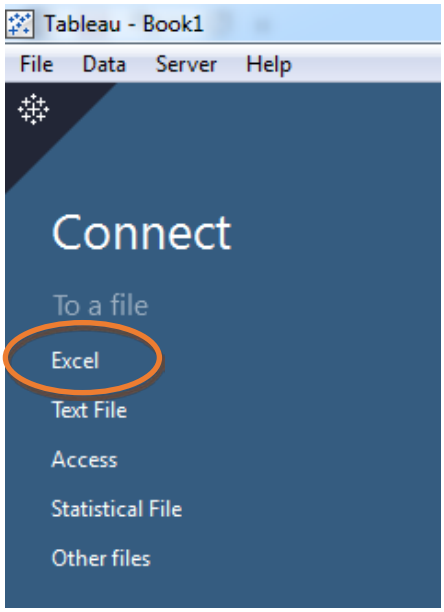


Figure 4: Tableau Connect to Data

Step 2. Locate and Select 'Hollywood_Tut02.xls' and click 'Open'

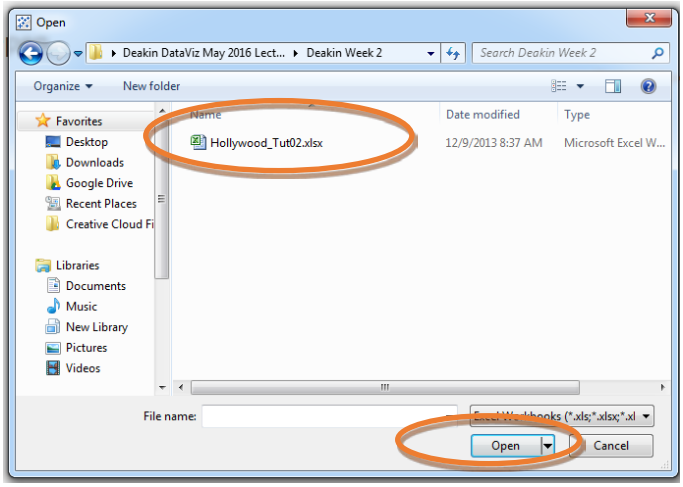


Figure 5: Select the Hollywood Tutorial file

Step 3. 'Connect live'. Ensure the 'Live' Connection option is selected, and drag the 'Data' worksheet in to the Preview (so that the data is shown), then click the 'Sheet 1' tab at the bottom of the screen.

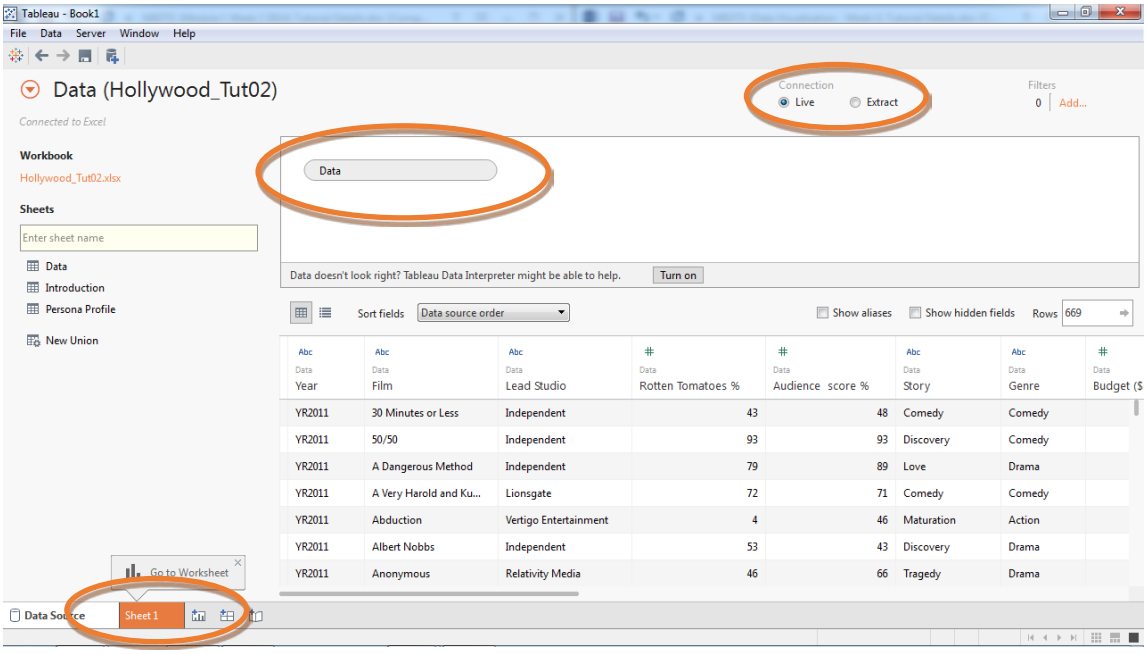


Figure 6: Tableau Connect live to the Excel file

c) Can you identify the labels for the Categorical data and the Continuous data?

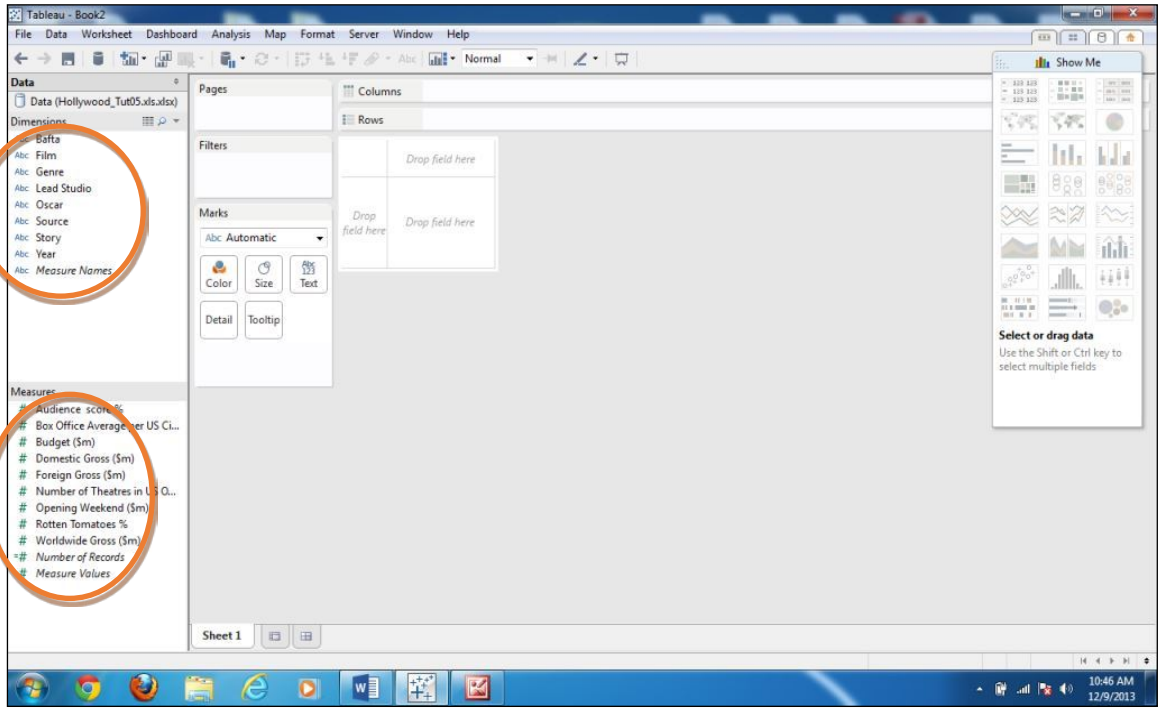


Figure 9: Tableau Work Sheet

As we have seen before with Tableau, Categorical data is referred to as 'Dimensions', and Continuous data is referred to as 'Measures'.

Figure 10: Dimensions/Categorical Data

Figure 11: Measures/Continuous Data

6. Configuring a set of Tableau Workspaces.

In this section we will configure 3 Tableau workspaces in preparation for placing them on to a Dashboard.

1. Popularity – A scatter plot showing the Comparison of Rotten Tomatoes' popularity ratings
2. Genre – A bar chart showing totals by the Movie Genre type
3. Details – A table chart showing the details for each movie

a) Using the drop-and-drag techniques you learnt in the previous Tableau tutorial, configure the Popularity Workspace shown in Figure 12 (see Hints below). Note: Make sure you rename the workspace to 'Popularity'.

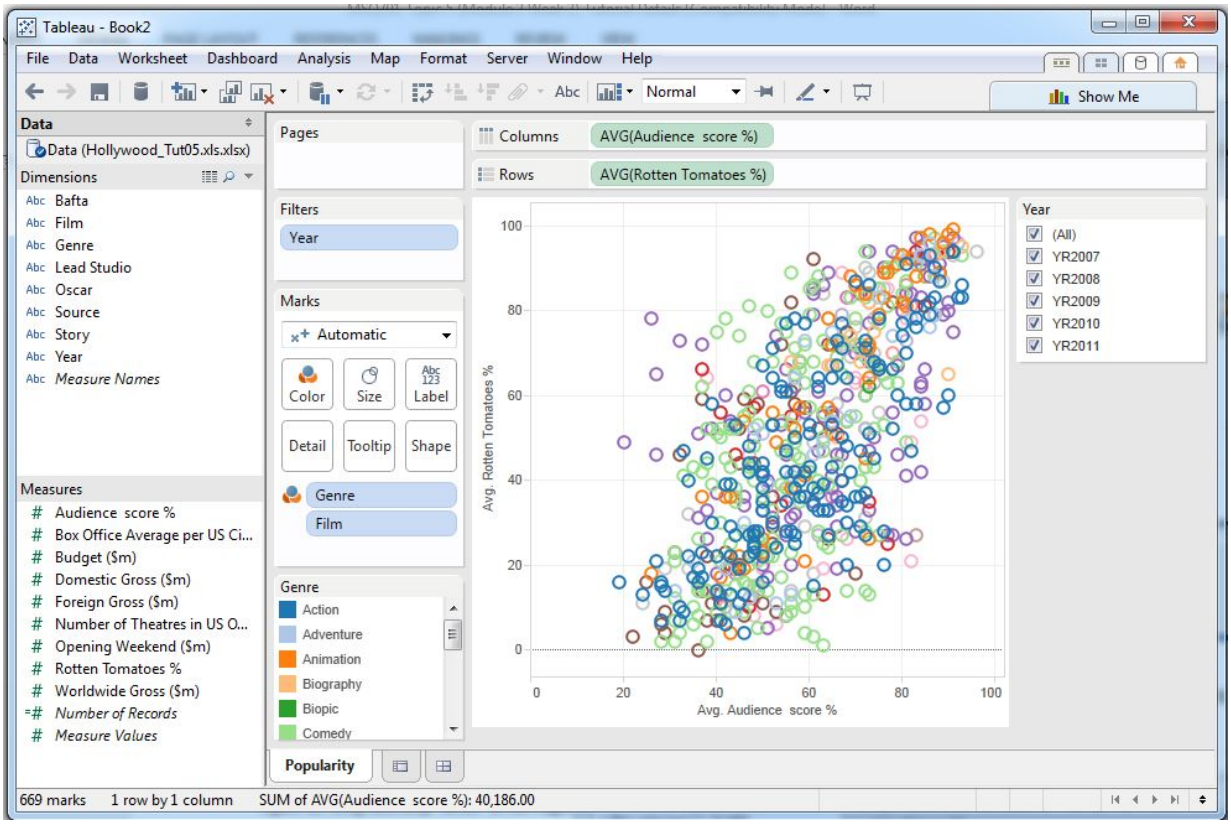


Figure 12: Drag-and-drop the 'Dimensions' and 'Measures' to the various Workspace Panels

1. You can create the selectable 'Year' panel, by 'Right-clicking' on the 'Year' in the Dimensions panel and selecting the 'Show Quick Filter' option.
2. Dropping-and-dragging the 'Film' Dimension on top of the 'Detail' panel will make the chart show a data point/dot for every Movie.
3. You can change the 'SUM' functions to 'AVG' functions for the Measures on the Columns and Rows panel, by 'Right-clicking' on the Measure (once you have dragged it in to place) and selecting the 'Measure' menu item, then the 'Average' function.

b) Next, click on the 'Add New Workspace' icon  at the bottom of the screen and add a new workspace. Then configure the new workspace as shown in Figure 13 (see Hints below). Note: Make sure you rename the workspace to 'Genre'.

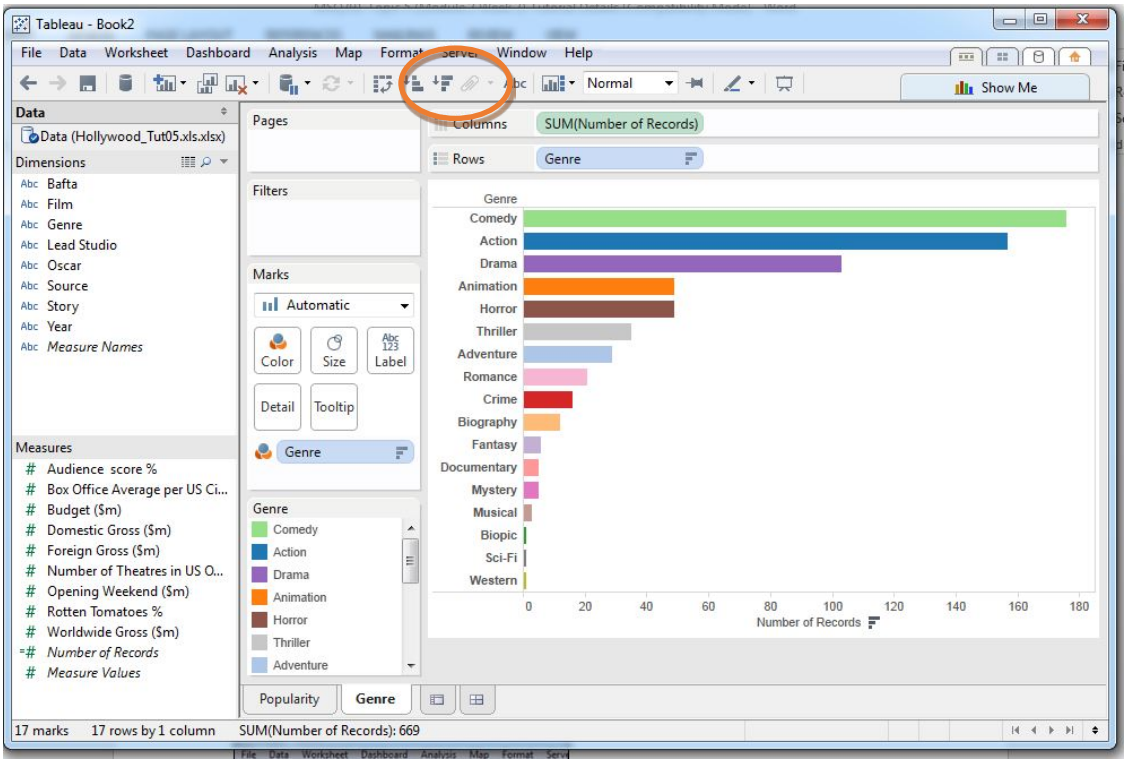


Figure 13: Drag-and-drop the 'Dimensions' and 'Measures' to the various Workspace Panels

You can sort the chart by selecting  the icon from the Menu Bar on the top of the workspace.

c) Next, click on the 'Add New Workspace' icon at the bottom of the screen and add a new workspace. Then configure the new workspace as shown in Figure 13 (see Hints below). Note: Make sure you rename the workspace to 'Detail'.

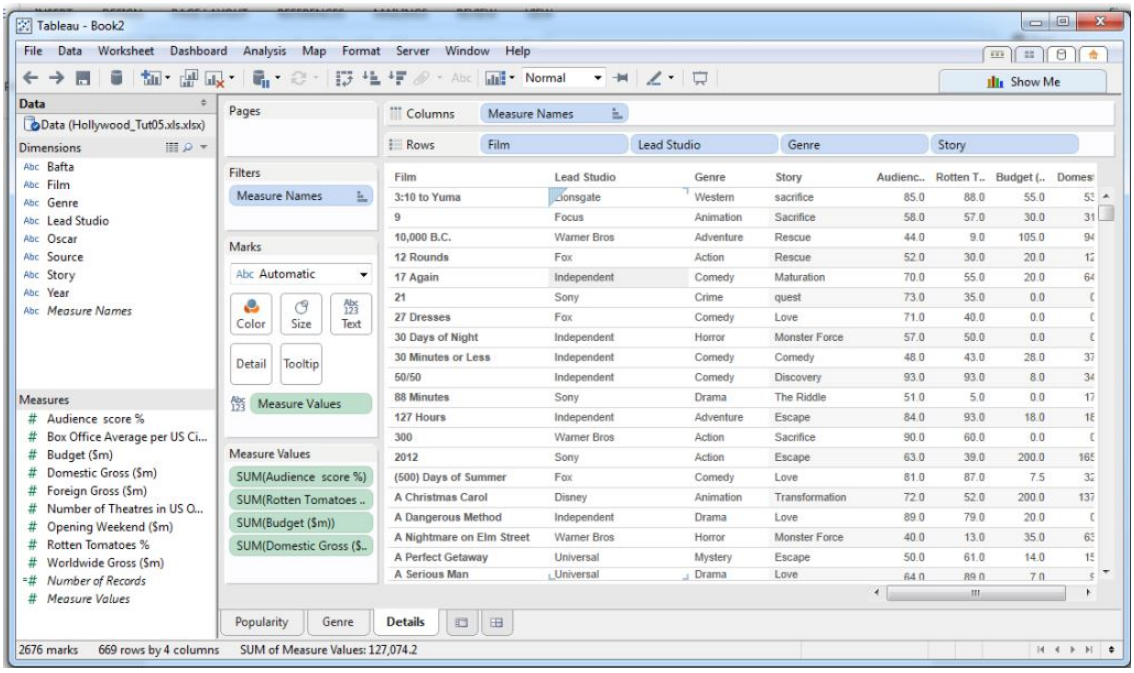


Figure 14: Drag-and-drop the 'Dimensions' and 'Measures' to the various Workspace Panels

You can select more than one Measure at a time by holding down the 'Ctrl' key and then selecting each of the Measures you need.

7. Configuring a Tableau Dashboard.

a) Click on the 'Add New Dashboard' icon  at the bottom of the screen and add a new Dashboard. Note: Make sure you rename the workspace to 'Movie Explorer' and set the Dashboard Size to 'Laptop'.

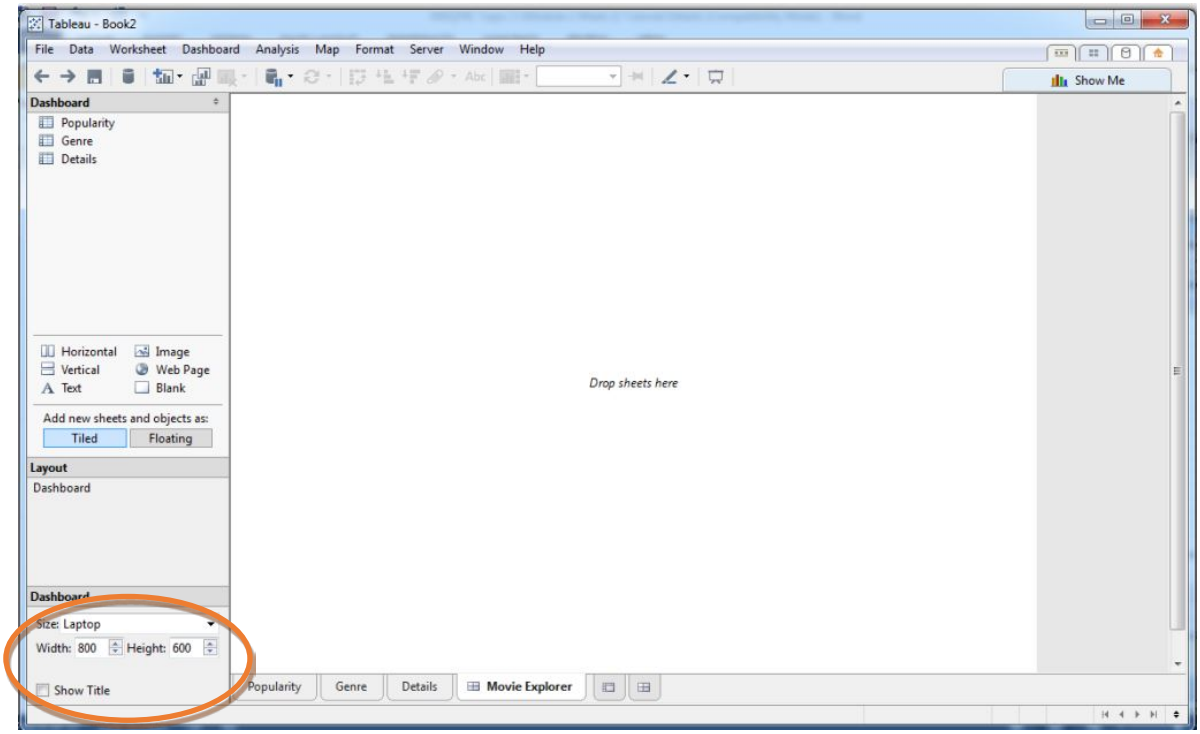


Figure 15: Add a new Dashboard

b) Next, drop-and-drag the 'Details' worksheet on to the Dashboard workspace (that is, where is says 'Drop sheets here').

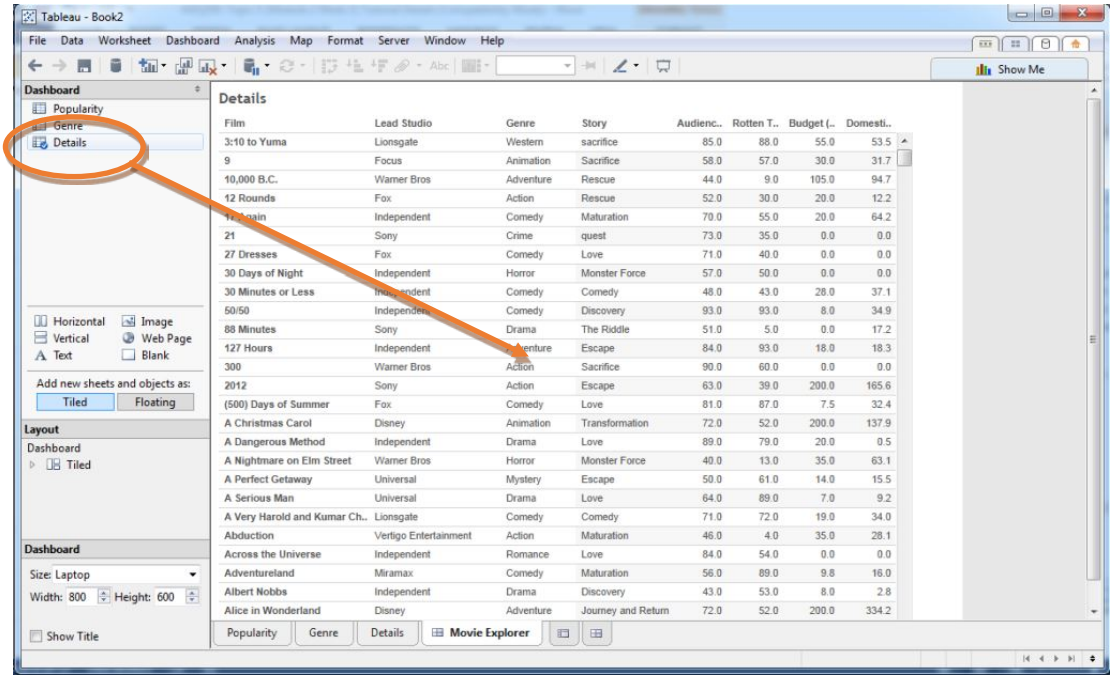


Figure 16: Place the 'Details' workspace on the Dashboard

c) Next, drop-and-drag the 'Genre' worksheet on to the Dashboard workspace above the 'Details' workspace. As you drop-and-drag the 'Genre' worksheet over the Dashboard, a grey box will appear indicating where the workspace will be positioned.

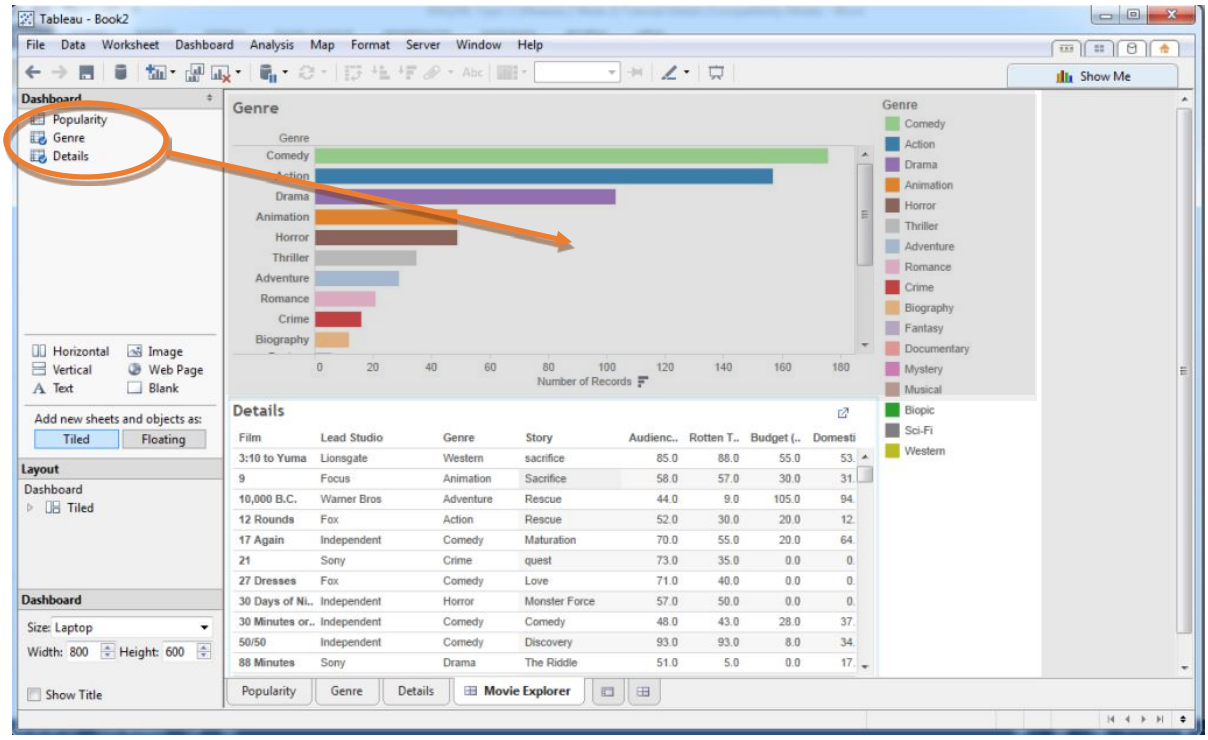


Figure 17: Place the 'Genre' workspace on the Dashboard

d) Next, drop-and-drag the 'Popularity' worksheet on to the Dashboard workspace to the left of the 'Genre' workspace. As you drop-and-drag the 'Popularity' worksheet over the Dashboard, a grey box will appear indicating where the workspace will be positioned.

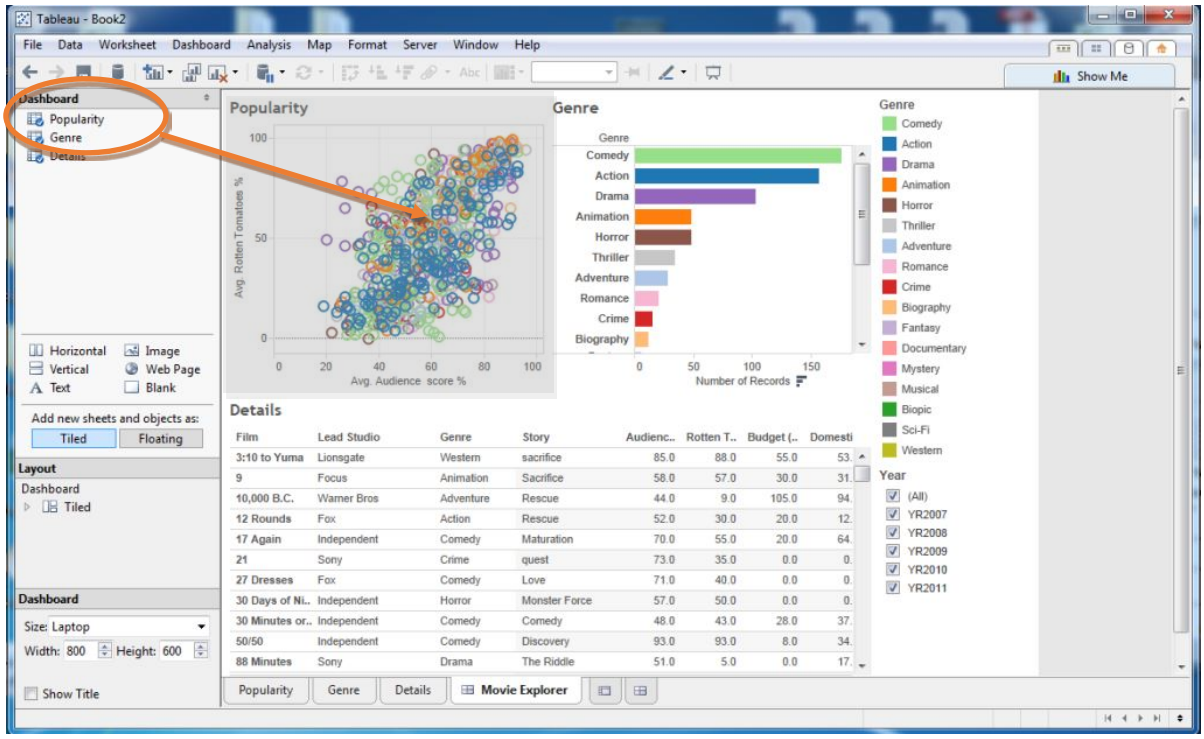


Figure 18: Place the 'Popularity' workspace on the Dashboard

e) Next, remove the 'Genre' colour legend from the right-hand side of the dashboard, and re-position the 'Year' filter to the top left-hand corner of the dashboard.

You can remove a Legend by selecting the Legend and clicking on the 'X' symbol at the top, and you can set a Filter to 'Floating' by selecting the Filter and using the 'v' system at the top.

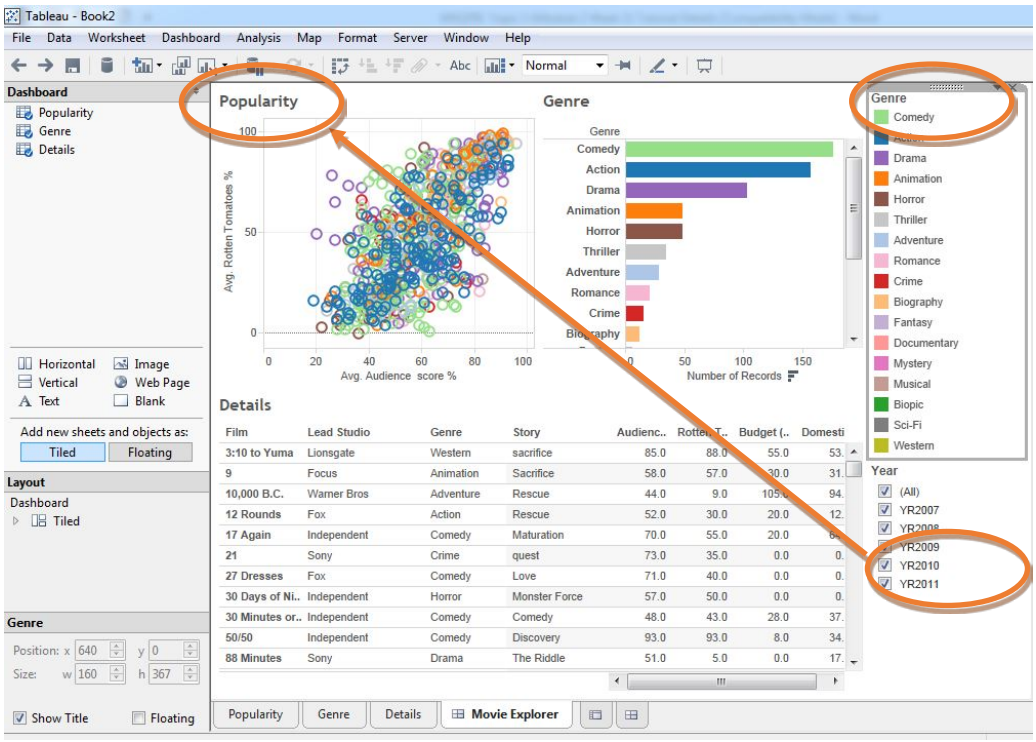


Figure 19: Remove the Genre colour legend and re-position the Year filter

f) Finally, re-size the Dashboard worksheets to high-light the importance of the information.

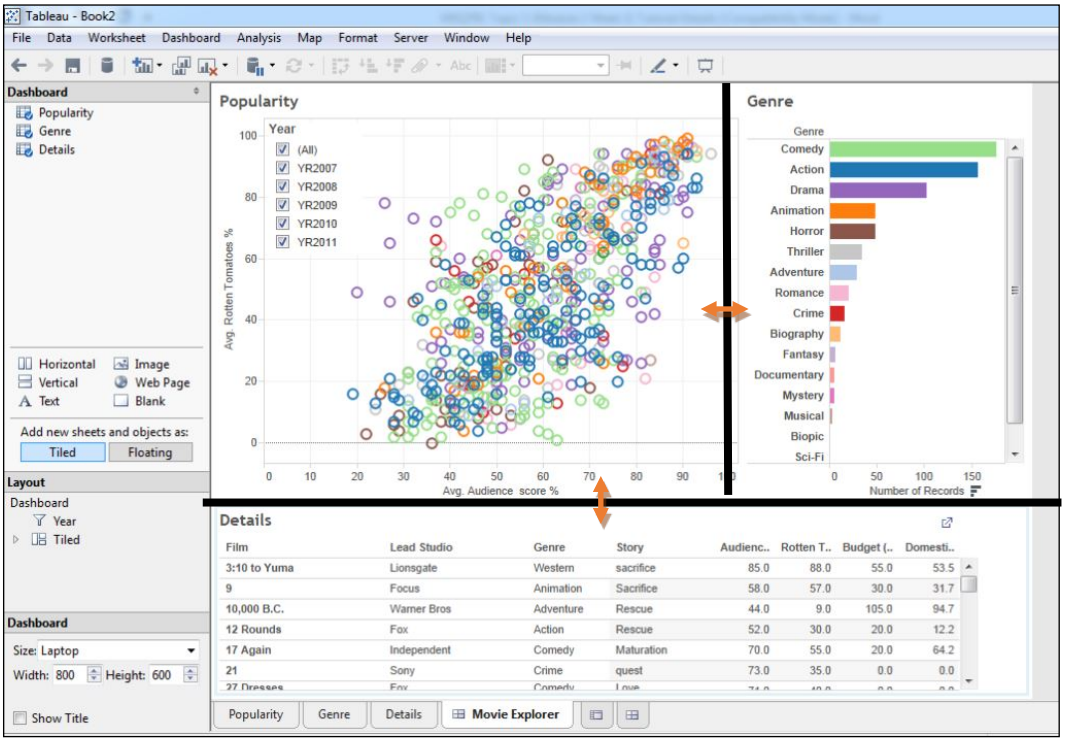


Figure 20: Re-size the Dashboard workspaces to emphasis importance

8. Adding Interactive Filters

The final staging in building out the Dashboard is to define and configure the methods of interacting with the Data Visualisation.

a) First, we will select a 'Use as Filter' function on then for both the 'Popularity' and 'Genre' workspaces (on the Dashboard).

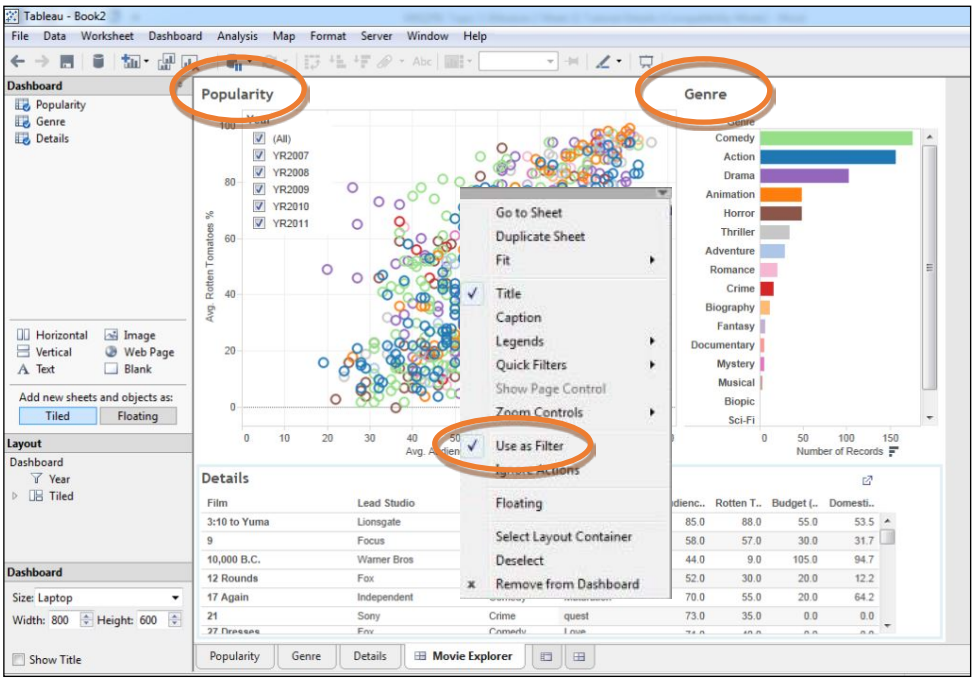


Figure 21: Set the 'Use as Filter' feature on the Popularity and Genre workspaces

b) And finally, we are going to add an Action to the Details workspace, so that when we select a specific movie a Browser window will open up with the details of the movie. To do this we will add a URL action to the sheet.

Step 1. From the Dashboard menu, select 'Actions….'

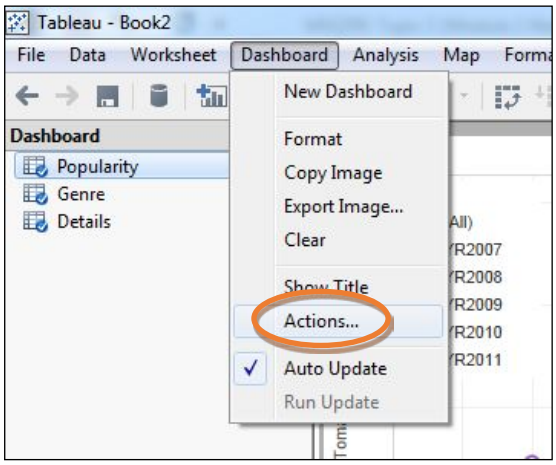


Figure 22: Select 'Actions….' From the Dashboard menu

Step 2. Select 'Add Action', and 'URL'

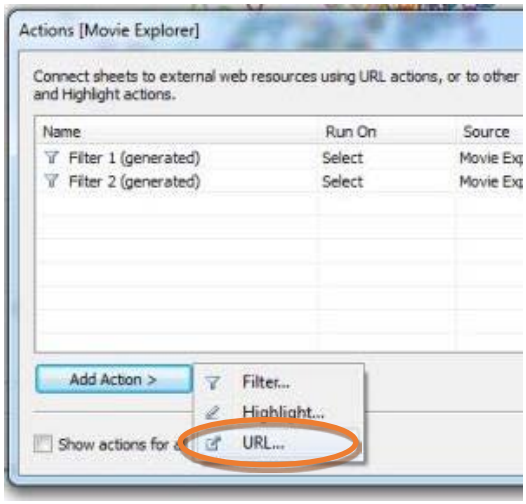


Figure 23: Select Add Action, then URL

Step 3. Add the URL, Select on the 'Details' sheet, and select the 'Run action on: Select' option. Then press Ok, and save the Action.

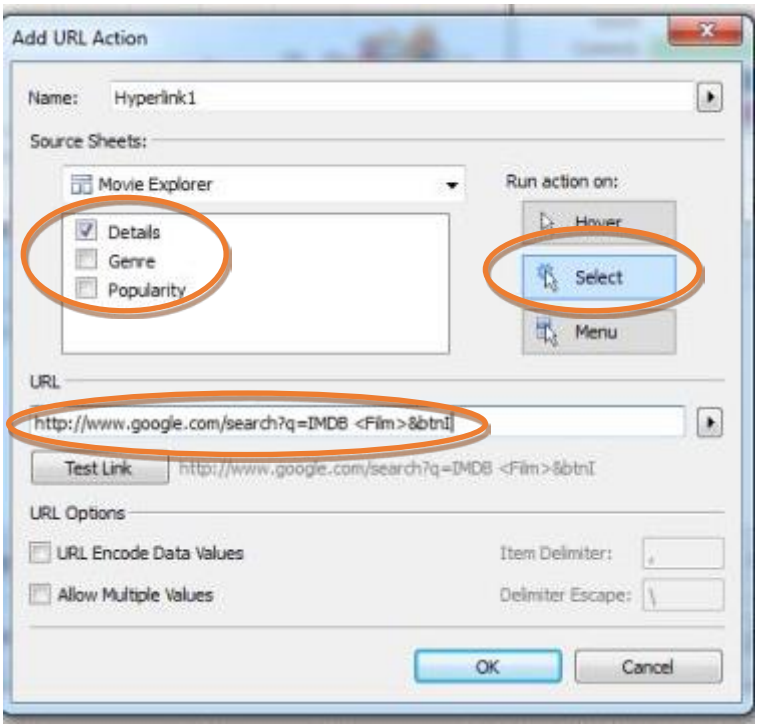


Figure 24: Add a URL to the Details workspace, and Run Action on Select

Hint:

The URL is a Google quick search for the IMDB site, and the name of the selected Film using a Tableau parameter/variable (that is, <Film>)…
http://www.google.com/search?q=IMDB <Film>&btnI

9. Now you're ready to begin exploring the Dashboard

Try selecting a Genre (clicking on the Bar Chart), then select 1 or more movies from the Popularity chart (you can click-and-drag to select a range of movies), then select one of the movies in the Details workspace and watch as a Browser window opens with additional details.

When using the Dashboard try to think about the Persona we defined at the beginning of the Tutorial, have we support the user's ability to answer their key questions?

The Questions they'd like to answer were:

Question 1: What are people's favourite Romantic movies?
Question 2: What movies might my kids enjoy?
Question 3: What movies should I avoid?

Have we helped the user achieve their outcomes?

Outcome 1: Pick 3 movies for my kids to watch over summer
Outcome 2: Pick 3 movies for me to watch over summer

Have we made the experience 'Fun'?

10. Changing the Link, and Exporting an Image

a) Next, try substituting 'RottenTomatoes' in place of 'IMDB' and checking to see if the URL will then go to the Rotten Tomatoes site instead.
b) Finally, using the 'Export Image…' option on the Tableau 'Dashboard' menu, save your Dashboard image out of Tableau and import them in to a Microsoft PowerPoint presentation. Also try annotating your PowerPoint slide with some explanations about the Dashboard layout and design.

References

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1. Source of data: http://www.informationisbeautiful.net/2012/hollywood-budgets-a-data-viz-challenge/
2. (with some manipulation)
3. Tool: Tableau Version 8.1 http://www.tableausoftware.com/
4. IMDB site: http://www.imdb.com/
5. Rotten Tomatoes: http://www.rottentomatoes.com/