UTS Library Getting started with data visualization and infographics

Background

Using data to tell stories is an essential communication skill for researchers. In this beginner's session, the Library will present on the various ways in which you can explore and visualise data, from simple web applications through to complex code driven techniques.

Following the presentation we will explore a simple Excel dataset using Microsoft Power BI, which allows you to build interactive dashboards of graphs, maps and text.

Prework for this class is to <u>download Microsoft Power Bl Desktop</u>, which is free to all enrolled staff and students of UTS. A limited amount of laptops will be brought to the session but if you can BYO laptop then please do.

There is a spreadsheet that we'll use when we play with Power BI in class. Please <u>download the spreadsheet from Sharepoint</u> and then file>save to your computer. You can also find the spreadsheet at Please be aware that currently Power BI is available on PC only.

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Power BI Step by Step Instructions

Power BI Exercise for ResHub

by David Litting (<u>david.litting@uts.edu.au</u> / 95143390) In this exercise we'll use a dataset adapted from Lynda's <u>Learning Microsoft Power</u> <u>BI Desktop course</u>. To make the visualisations even more fun and configurable I've added a couple of fields to it – namely a product these people have purchased and what they paid for it.

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First Name	Last Name	 Phone 	 Street Address 		-	Zipcode 🔹	Req Date 🚽	Purchase	d 💌 Price	Υ.	
Nicholas	Neal	(254) 882-319	4 4290 Mauris Str	eet		75963	30/11/2014	wingnut	\$	77.00	
Charity	Mccarthy	(243) 362-579	1 517 Vineland R	oad		87730	30/11/2014	flasburter	r \$	35.00	
Hilel	Pearson	(320) 933-048	5 5261 Habitant S	it.		99026	30/11/2014	doohicke	y \$	6.00	
David	Miranda	(788) 268-853	8 984 Tincidunt A	ve.		29481	1/12/2014	dealyabo	b \$	217.00	
Colby	Frederick	(132) 867-799	2 5093 Eu Street			87731	1/12/2014	dealyabo	b \$	217.00	
Vanna	Gilliam	(242) 404-858	8 7776 Caesar St.			99790	1/12/2014	fandangle	er \$	112.00	
Allen	Carr	(643) 416-282	5 1695 Sociis Ave			65050	2/12/2014	dealyabo	b \$	217.00	
Ethan	Robinson	(113) 262-458	8 3475 Netus Rd.			53820	3/12/2014	fandangle	er \$	112.00	
) Brent	Black	(167) 468-906	5 353 Risus Stree	t		47993	4/12/2014	fandangle	er \$	112.00	
L Bertha	Pate	(278) 224-135	6 5759 Palladium	Ave.		64457	4/12/2014	wingnut	\$	77.00	
2 Serina	Bonner	(124) 702-098	4 4486 Eunice Av	e.		64459	5/12/2014	doohicke	y \$	6.00	
3 Miriam	Roy	(243) 523-055	0 9687 Faucibus F	Rd.		70513	5/12/2014	doohicke	y \$	6.00	
1 Jin	Fields	(156) 258-973	9 5468 Theodore	Parker Blvd.		20006	5/12/2014	wingnut	\$	77.00	
5 Phyllis	Cox	(565) 141-352	9 160-3783 Sem,	Road		01080	5/12/2014	wingnut	\$	77.00	

Step 1: Download the Widget orders spreadsheet here or at https://bit.ly/2RADs8S

Step 2 – Then, load up Microsoft Power BI Desktop!





Step 3 - In Power BI desktop go to home > get data

Home	View	Μ
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Format Pain	ter Data •	s
ipboard		

Step 4 – Choose Excel from the drop down

Get Data	
	All
All	XI Excel
Eilo	Text/CSV

Step 5 - Upload Widget Orders

Step 6 – When it appears in Power BI tick Requests (or Table 1, they are the same data) from within the spreadsheet...

🖌 🛑 Widget orders.xlsx [2]								
	Table1							
✓ 🖽	Requests							
 and then	press load							
Load	Edit	Cancel						

Step 7 - Once the spreadsheet uploads you'll see the data listed as requests on the right of screen under the Fields heading

FIELDS	>	
𝒫 Search		
Requests		



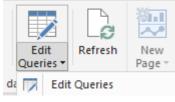
Step 8 – Press the little grid (data) icon on the left of screen. You'll then see the spreadsheet in Power BI

Ш	\times \checkmark							
	First Name 💌	Last Munie 💌	Phone 💌	Street Address	Zipcode 💌	Req Date 💌	Purchased 💌	Price 💌
	Nicholds	Neal	(254) 882-3194	4290 Mauris Street	75963	Sunday, 30 November 2014	wingnut	77
	Charity	Mccarthy	(243) 362-5791	517 Vineland Road	87730	Sunday, 30 November 2014	flasburter	35
⊐⊟	Hilel	Pearson	(320) 933-0485	5261 Habitant St.	99026	Sunday, 30 November 2014	doohickey	6
	David	Miranda	(788) 268-8538	984 Tincidunt Ave.	29481	Monday, 1 December 2014	dealyabob	217

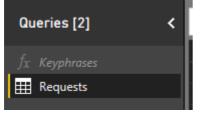
Step 9 – Glancing at the data I can see that first and last names are in different columns. I might want to have that as one field for the purposes of my data viz. So what I'm going to do is edit the data in Power BI. To do this go to home and choose edit queries



Step 10 – And then from the drop down choose edit queries again



Step 11 – Once in edit query you should see that data. If you don't immediately see it click requests under the Queries heading



Step 12 – Using shift-select grab the column titles for first and last name (they'll go yellow)

				25.10
	JA - 100		community per	
	rst Name 📃 👻	A ^B C Last Name	✓ A ^B _C Pł	
1 Nicho	las	Neal	(254) 8	
2 Charit	y	Mccarthy	(243) 3	
3 Hilel		Pearson	(320) 9	
4 David		Miranda	(788)	
5 Colby		Frederick	(132) 8	
C Marrie		0000-00	(242) (
Step 13 – No	w go to transf	orm > merge c	olumns	
Transform Ac	d Column View	Help		
🖆 Transpose	Data Type: Text 🔻	1 → 2 Replace Values	🝷 🏪 Unpivot Columns 🝷	Merge Column
Carl Reverse Rows	📴 Detect Data Ty	pe 😈 Fill 🔻	🔠 Move 🝷	Split Format
¹ ₂ Count Rows	🗐 Rename	🖫 Pivot Column	Convert to List	Column - Column
e		Any Column		Text Column

Step 14 – For the **separator, choose tab**. For the new **column name, choose name**. Then press ok.

Merge Columns

Choose how to merge the selected columns.

Separator	
Tab	Ŧ
New column name (optional)	
Name	

ОК

			P		2 -1 -1	_	-		P		2	
🛛 🗸 🖧 Name	ר א ^י כ א	hone	A ^B _C Street Add	ress 💌	1 ² 3 Zipcode	*	🔛 Req Date	×.	A ^B _C Purchased	~	1 ² 3 Price	~
1 Nicholas Neal	(254)	882-3194	4290 Mauris St	reet		75963	30/11/2	2014	wingnut			77
2 Charity Mcca	arthy (243)	362-5791	517 Vineland R	oad		87730	30/11/2	2014	flasburter			35
3 Hilel Pear	son (320)	933-0485	5261 Habitant S	St.		99026	30/11/2	2014	doohickey			6
4 David Mira	nda (788)	268-8538	984 Tincidunt A	we.		29481	1/12/.	2014	dealyabob			217
5 Colby Fred	erick (132)	867-7992	5093 Eu Street			87731	1/12/.	2014	dealyabob			217
6 Vanna Gillia	m (242)	404-8588	7776 Caesar St.			99790	1/12/.	2014	fandangler			112
7 Allen Carr	(643)	416-2825	1695 Sociis Ave			65050	2/12/.	2014	dealyabob			217
8 Ethan Robi	nson (113)	262-4588	3475 Netus Rd.			53820	3/12/.	2014	fandangler			112
9 Brent Black	(167)	468-9065	353 Risus Stree	t		47993	4/12/2	2014	fandangler			112
10 Bertha Pate	(278)	224-1356	5759 Palladium	Ave.		64457	4/12/2	2014	wingnut			77
11 Serina Bonr	ier (124)	702-0984	4486 Eunice Av	e.		64459	5/12/2	2014	doohickey			6
12 Miriam Rov	(243)	523-0550	9687 Faucibus	Rd		70513	5/12/2	2014	doohickey			6

Step 15 – There's also one thing I notice whilst here. And that is zipcode is being expressed as a number.

Now it looks like this

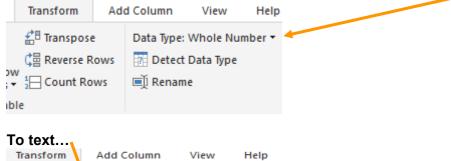


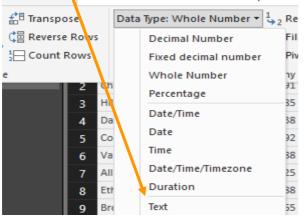


Whilst this sounds good in theory, expressing these digits as a number causes problems when you have a zipcode that begins with a zero – as the zero disappears. And we need that zero for Power BI to recognize zipcode and let the software use it to find locations.

So, we'll need to change the formatting of this column from numbers to text.

Step 16 – Click on the column **zipcode**. It will go yellow. Then, **press the transform tab** and **change the formatting from whole number** ...

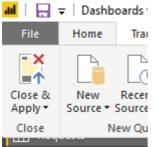




Now it looks like this!

<pre>d Columns",{{"Zipcode", type text}})</pre>									
💌 🗚 C Zipcode	🛛 🛄 Req Date 🛛 💌	A ^B _C Purchased							
75963	30/11/2014	wingnut							
87730	30/11/2014	flasburter							
99026	30/11/2014	doohickey							
20491	1/10/2014	daaluabab							

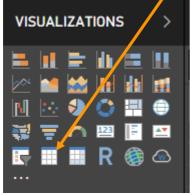
Step 17 – I'm now happy with my data cleaning. So I'm going to choose **Home > Close and apply**



Step 18 – We are now back in the basic Power BI mode. Let's go to the report mode



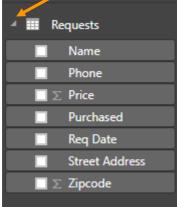
You should now see a big white space. What I'm going to do now is to bring the data onto this space and use it as the basis of my visualisation. To do this **click anywhere** in the big white space, and then go over to the Visualizations area on the right and choose this icon – table



This should put a blank table placeholder on the dashboard.

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L			

Step 19 – Now go over to the right of screen and use the little triangle drop down under requests (beneath the fields heading). It should open up and show you this:



Step 20 – Click on name, price, purchased, request date street address and

zipcode in that order. (Power BI will add data to the table in the order you click it) Leave out phone – it doesn't help our visualisation today.

It should then populate the table on the dashboard until you see something like this:

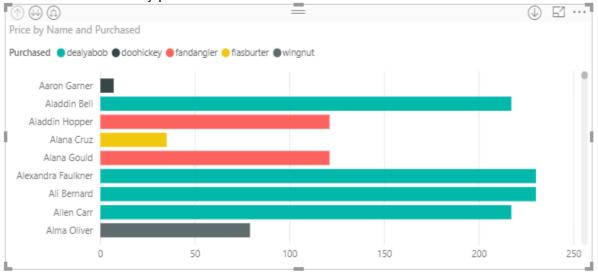
			=	-				63 **
Name	Price	Purchased	Year	Quarter	Month	Day	Zipcode	ļ
Aaron Garner	7	doohickey	2015	Qtr 1	January	6	22211	- 1
Aladdin Bell	217	dealyabob	2014	Qtr 4	December	15	53818	
Aladdin Hopper	121	fandangler	2015	Qtr 1	February	3	64456	
Alana Cruz	35	flasburter	2014	Qtr 4	December	15	55063	
Alana Gould	121	fandangler	2015	Qtr 1	January	27	7843	
Alexandra Faulkner	230	dealyabob	2015	Qtr 1	January	12	64458	
Ali Bernard	230	dealyabob	2015	Qtr 1	February	10	22210	
Allen Carr	217	dealyabob	2014	Qtr 4	December	2	65050	
Alma Oliver	79	wingnut	2015	Qtr 1	February	24	90624	
Amy Head	6	doohickey	2014	Qtr 4	December	13	83301	
Amy Weber	217	dealyabob	2014	Qtr 4	December	11	60151	
Aquila Castro	230	dealyabob	2015	Qtr 1	January	29	98051	
Armando Horne Total	230 23119	dealvabob	2015	Otr 1	February	12	66758	

Step 21: Now lets cycle through some visualisations using the grid of icons on the right.

Whilst the table on the dashboard is still highlighted (eg: has a border around it – if it isn't highlighted click inside the table once) click on the Bar chart option



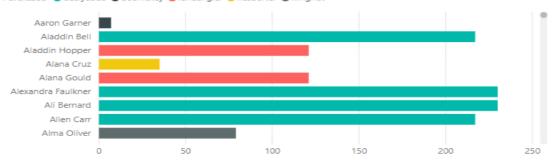
We now see what every person in the table ordered ©



Step 22: Let's try another visualisation. To do that we can **copy this visualisation with ctrl-c and ctrl-v.** When you get the duplicate use the drag bar at the top of the image to pull it away from the old one like this (see overleaf):

Price by Name and Purchased

Purchased 🔵 dealyabob 🌑 doohickey 🛑 fandangler 🔶 flasburter 🜑 wingnut

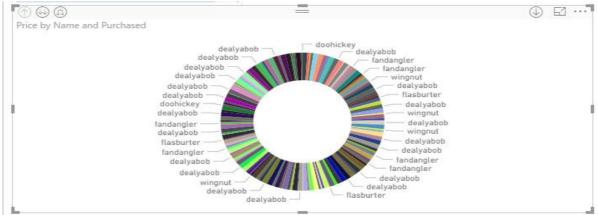


Price by Name and Purchased

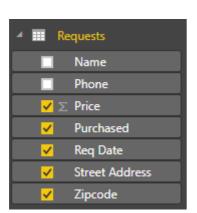


Step 23 – Click on your newest bar chart and then try another visualisation – donut chart

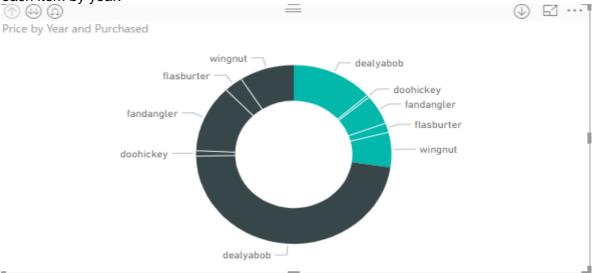
... oh dear this isn't all that great is it? That's because it's filing everything by customer..



Step 24 - So, let's take out name from the table on the right of screen

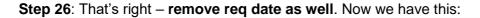


(NB: This should apply only to the highlighted chart and not all – however if you click out of the donut chart and then untick name it will remove it from everything)



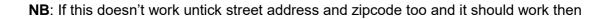
Step 25: Now if we click the donut we can see how much total cash was spent on each item by year.

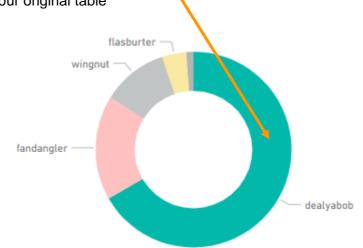
This is a total sales breakdown divided into 2014 and 2015 sales. But what if I wanted to know how much my widgets sold overall? What would I do?



Price by Purchased

fandangler

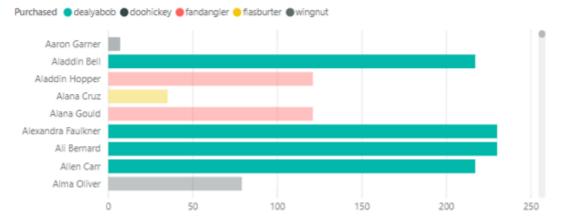




Step 27: Click on dealyabob and it will isolate itself – it will also isolate those orders on our original table

dealyabob

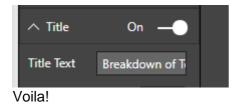
Price by Name and Purchased

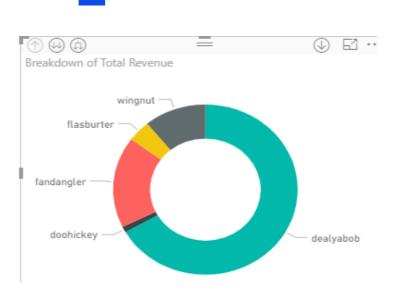


Step 28 – Whilst still selecting the donut go to the format (paint roller) option on the right under the visualisation icons

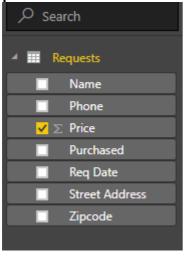


Step 29 – then choose title and open up the menu for Title using the arrow. Using the title text option rename the graph 'Breakdown of Total Revenue'

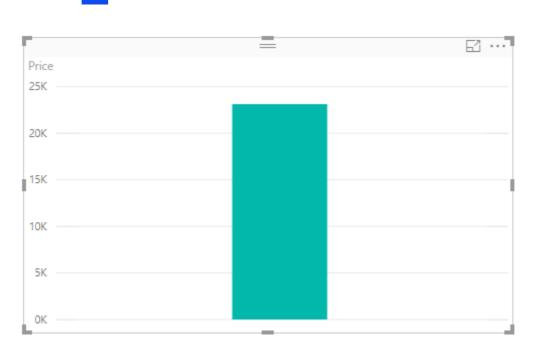




Step 30 – Let's leave that on our dashboard and add another thing. How about we get a figure for the total amount of money we made selling our widgets? Click in the blank space on our dashboard to unselect all current visualisations. Then, click just price



Step 31 – Now we have a bar chart/histograph of the total amount of money we've made selling widgets.



Step 32 – This is cool but we might like to know the exact number. To do this **click the formation again.**



Step 33: Go down to data labels and turn them on



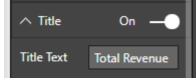
Step 34: We can also change the data colour if we'd like to while we're here

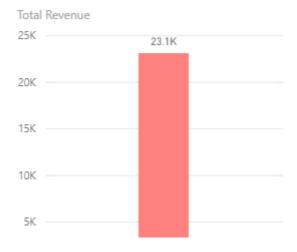


I'll choose salmon coloured. Voila



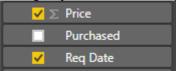
Step 35: Use title to rename it Total Revenue

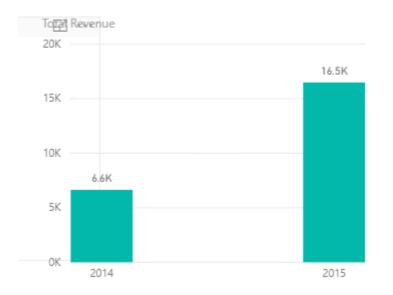




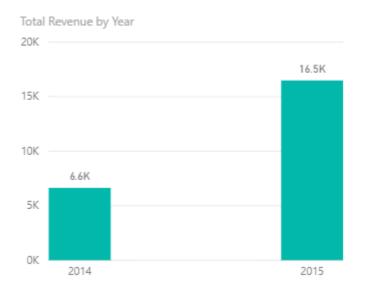


Step 36: If you click request date to split it into two years (you will lose any colour changes you've made sadly)





Step 37: Use the format> title option again to change the title to Revenue by year





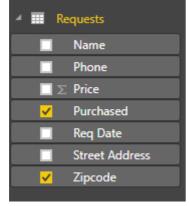
Step 38: Click out on the white space of the dashboard and choose a map viz (middle of the farmost right column. There is a blue 'ArcGIS map' option on the bottom right that will not work unless you have ArcGIS)



Here it is as a blank

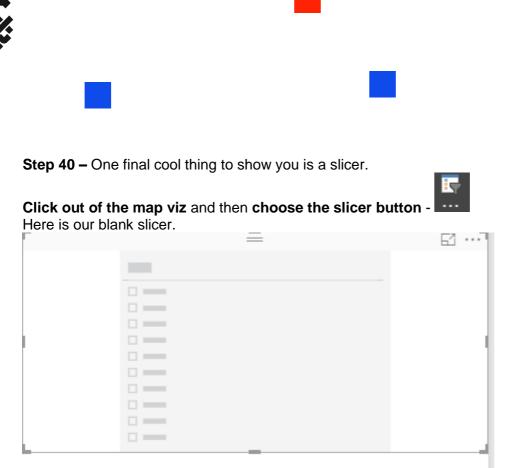


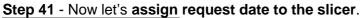
Step 39 - Now click on zipcode and purchased

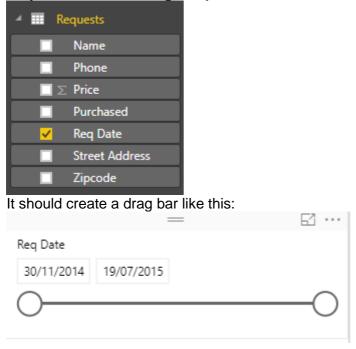


Here are all the places people ordered widgets from. Cool!









25.10.2018

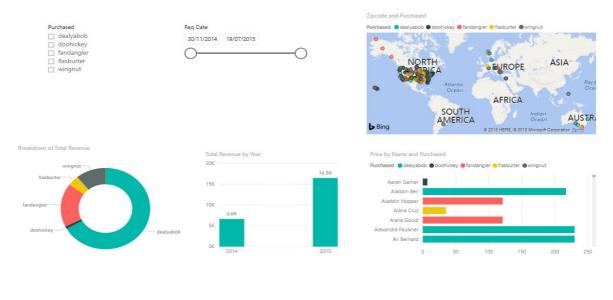


Step 42 – Lets make one more blank slicer. To do this click out in the white space on the dashboard and hit the slicer icon again. Then click on purchased from the right of screen.

🔺 📰 Re	quests	
	Name	
	Phone	
Σ	Price	
✓	Purchased	
	Req Date	
	Street Address	
	Zipcode	
You shou	uld see this:	

		=	63	
Pur	chase	d		
	deal	yabob		
	dooł	hickey		- I.
	fand	angler		
	flasb	urter		
	wing	jnut		- 1

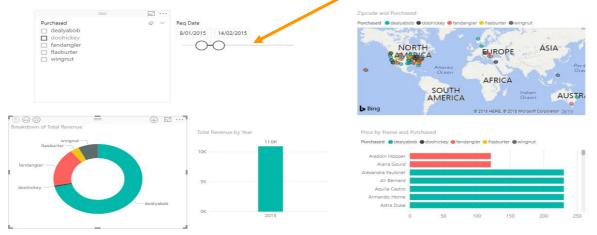
Step 43: Using the drag bars around the images and also the click grab function on the windows, resize them and move them around so that every thing looks nice and in proportion (in this example I've moved my slicers to the top left) See how we are building a dashboard?



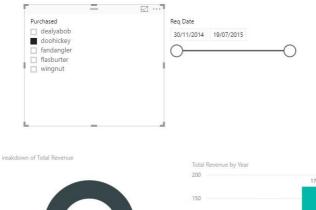


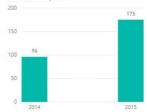


Step 44: Now lets slice by date using the drag bar



Step 45: Or slice by product using the product table. eg: Doohickey





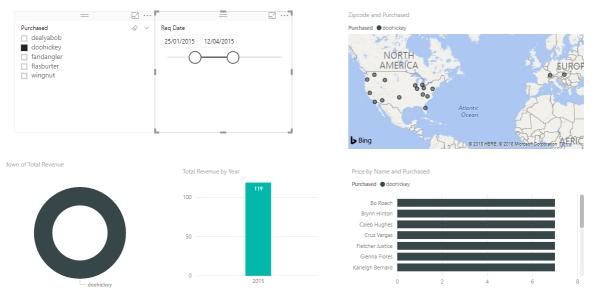




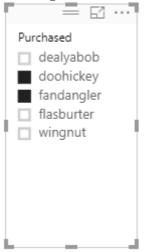
Price by Name and Purchased



Step 46: Or by doohickey and time



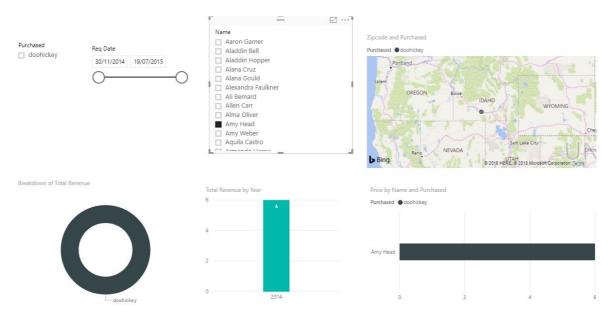
You can select more than one aspect of the checkboxes by holding down CTRL and clicking







Step 47: We can even **make one more slicer for name!** If we slice by name the person who made the purchase will be located on the map.



Step 48:. Let's save our dashboard now using the disc icon in the top right III : S C = I File Home

Step 49: Now that we've saved out project let's publish it. This will allow us to view an interactive version of the project on the internet. First thing – click publish

	reshub test - Power Bl Desktop View Modeling Help					
Cut Copy Copy Software A construction Software A construction Soft	Get Recent Enter Data * Sources * Data	New New Buttons Page + Visual + Constructions	From From Marketplace File	Manage Relationships	in New Measure	Publish
Clipboard	External data	Insert	Custom visuals	Relationships	Calculations	Share

Step 50: If you never completed the signup form when you first opened Power BI desktop you'll have to signup now.

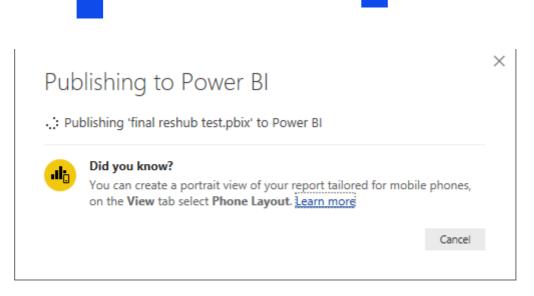
7.5	× Sign up for a Power BI account You don't seem to have an account for Power BI. Please click the button to	
s Dom	sign up. Sign up for Power Bl	
	Get started	
	Enter your work email address This is required. Sign up log	

Step 51: Once you have signed up you should see an option called Publish to Power BI - choose

My Workspace (this is the online version of Power BI)

_			
	Publish t Select a destina	o Power Bl	×
	My workspace		^
	ArtSoc Team		
	DDL Team		

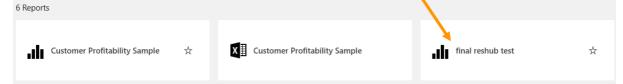
It will then get publishing...



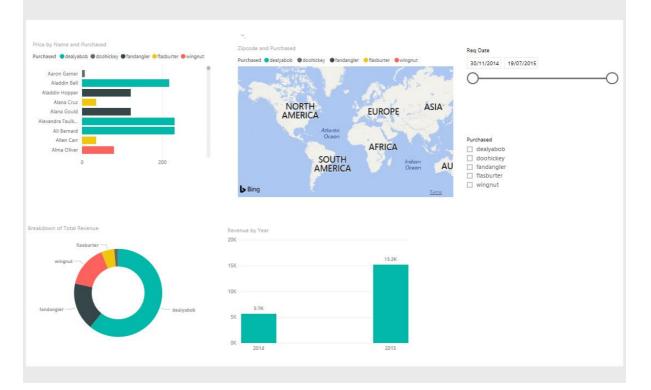
Step 52: When it's finished it looks like this – click 'open final reshub test' or whatnot using the link -

Puk	olishing to Power BI	×
🗸 Su	iccess!	
<u>Open</u>	'final reshub test.pbix' in Power BI	
<u>Get Q</u>	uick Insights	
•	Did you know? You can create a portrait view of your report tailored for mobile phones, on the View tab select Phone Layout. Learn more Got it	

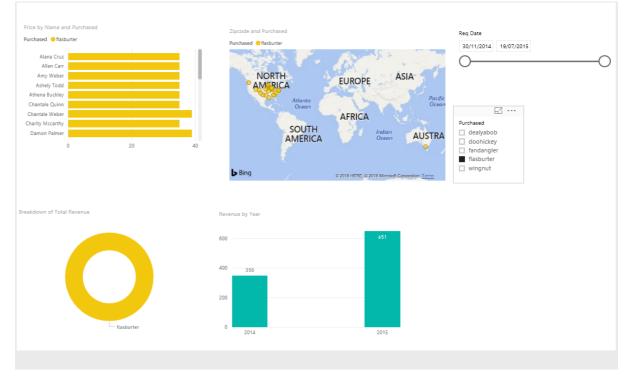
Step 53: After that you should see your published document under reports



Clicking on it brings you this loveliness



The buttons are live!







Step 54: The maximise button will let it go full-screen



If you ever want to go straight back to this web based version of Power BI you can find it via the start window. It looks like this

