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 **download Microsoft Power BI Desktop**, 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 **download the spreadsheet from Sharepoint** and then file>save to your computer. You can also find the spreadsheet at
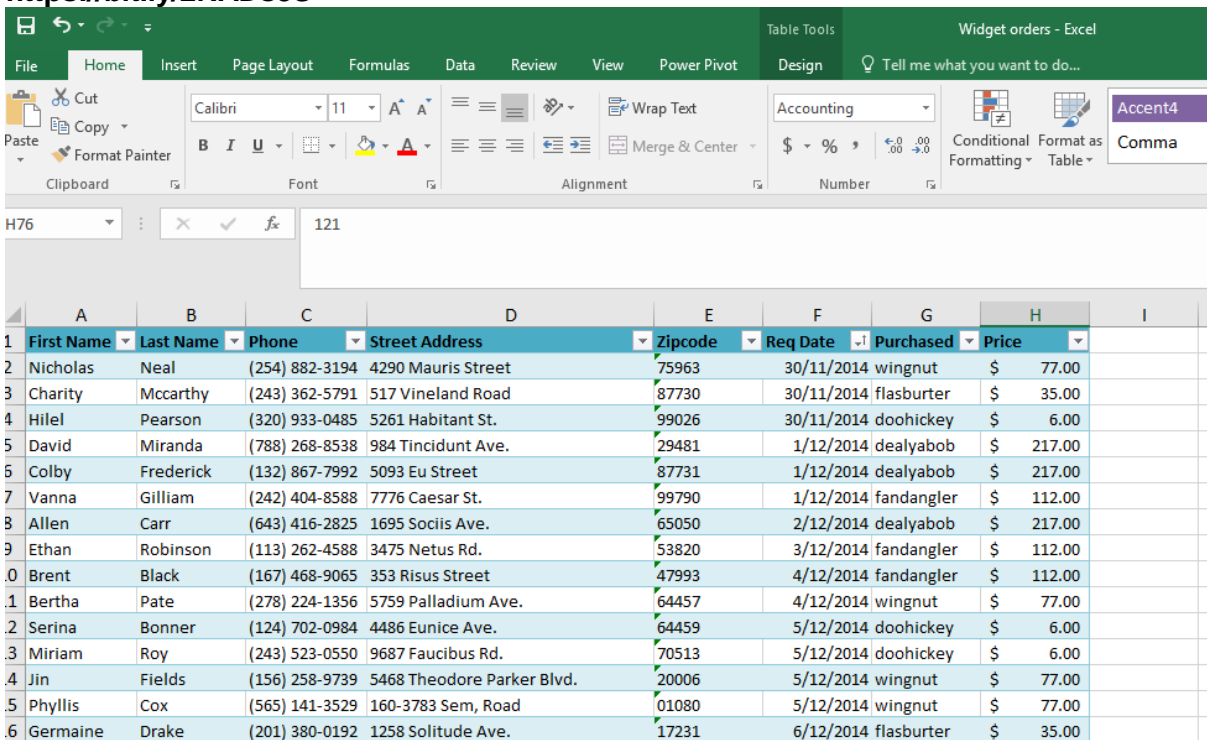**Please be aware that currently Power BI is available on PC only.**

Power BI Step by Step Instructions

Power BI Exercise for ResHub
by David Litting (david.litting@uts.edu.au / 95143390)

In this exercise we'll use a dataset adapted from Lynda's **Learning Microsoft Power BI Desktop course** . 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.
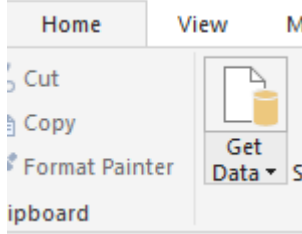
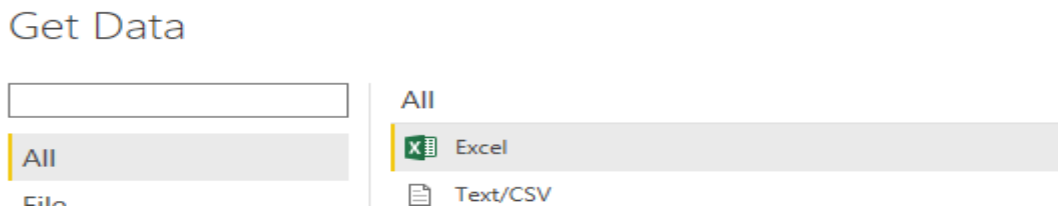**Step 1:** **Download the Widget orders spreadsheet here** or at **https://bit.ly/2RADs8S**

	First Name	Last Name	Phone	Street Address	Zipcode	Req Date	Purchased	Price
1	First Name	Last Name	Phone	Street Address	Zipcode	Req Date	Purchased	Price
2	Nicholas	Neal	(254) 882-3194	4290 Mauris Street	75963	30/11/2014	wingnut	$ 77.00
3	Charity	Mccarthy	(243) 362-5791	517 Vineland Road	87730	30/11/2014	flasburter	$ 35.00
4	Hilel	Pearson	(320) 933-0485	5261 Habitant St.	99026	30/11/2014	doohickey	$ 6.00
5	David	Miranda	(788) 268-8538	984 Tincidunt Ave.	29481	1/12/2014	dealyabob	$ 217.00
6	Colby	Frederick	(132) 867-7992	5093 Eu Street	87731	1/12/2014	dealyabob	$ 217.00
7	Vanna	Gilliam	(242) 404-8588	7776 Caesar St.	99790	1/12/2014	fandangler	$ 112.00
8	Allen	Carr	(643) 416-2825	1695 Sociis Ave.	65050	2/12/2014	dealyabob	$ 217.00
9	Ethan	Robinson	(113) 262-4588	3475 Netus Rd.	53820	3/12/2014	fandangler	$ 112.00
10	Brent	Black	(167) 468-9065	353 Risus Street	47993	4/12/2014	fandangler	$ 112.00
11	Bertha	Pate	(278) 224-1356	5759 Palladium Ave.	64457	4/12/2014	wingnut	$ 77.00
12	Serina	Bonner	(124) 702-0984	4486 Eunice Ave.	64459	5/12/2014	doohickey	$ 6.00
13	Miriam	Roy	(243) 523-0550	9687 Faucibus Rd.	70513	5/12/2014	doohickey	$ 6.00
14	Jin	Fields	(156) 258-9739	5468 Theodore Parker Blvd.	20006	5/12/2014	wingnut	$ 77.00
15	Phyllis	Cox	(565) 141-3529	160-3783 Sem, Road	01080	5/12/2014	wingnut	$ 77.00
16	Germaine	Drake	(201) 380-0192	1258 Solitude Ave.	17231	6/12/2014	flasburter	$ 35.00

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

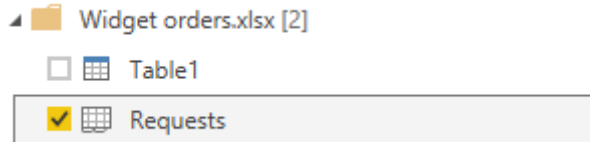**Step 3** – In Power BI desktop go to home > get data
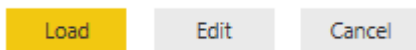

Step 4 – Choose Excel from the drop down

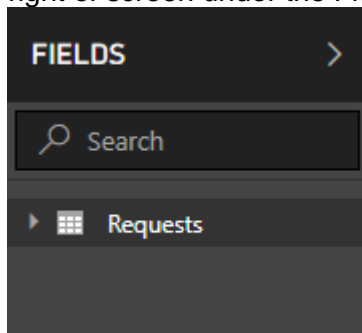**Step 5 –** Upload Widget Orders

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


… and then press load

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

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

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**
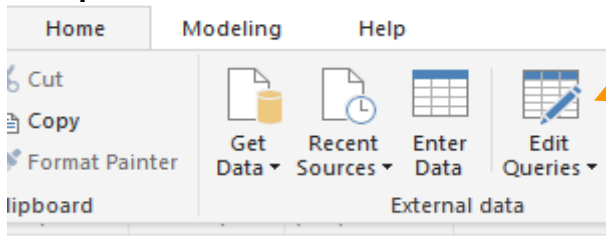
Step 10 – And then from the drop down choose **edit queries** again
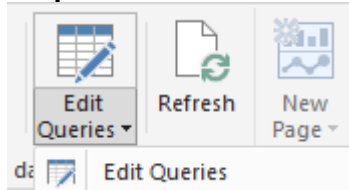
Step 11 – Once in edit query you should see that data. If you don't immediately see it click requests under the Queries heading
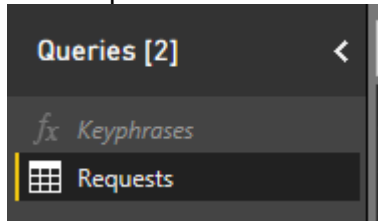
Step 12 – Using **shift-select grab the column titles for first and last name** (they'll go yellow)

Step 13 – Now go to **transform > merge columns**
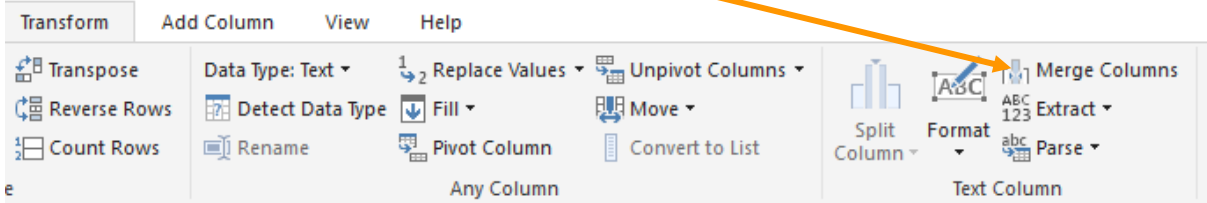
Step 14 – For the **separator, choose tab**. For the new **column name, choose name**. Then press ok.

Merge Columns

Choose how to merge the selected columns.

Separator

| Tab |

New column name (optional)

| Name |

OK

Now it looks like this

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

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** …
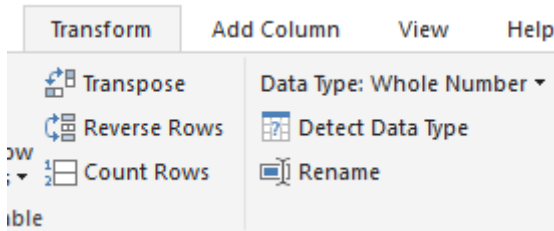
To text…
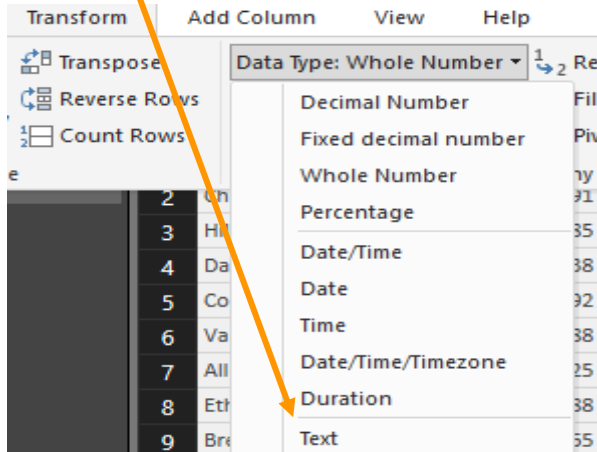
Now it looks like this!

Step 17 – I'm now happy with my data cleaning. So I'm going to choose **Home > Close and apply**
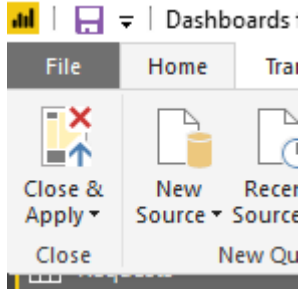
Step 18 – We are now back in the basic Power BI mode. Let's go to the report mode

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**
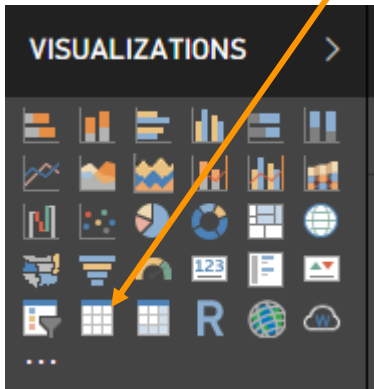
This should put a blank table placeholder on the dashboard.

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:
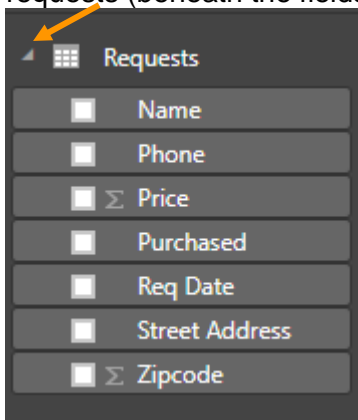
Step 20 – Click on **name, price, purchased, request date street address and zipcode** in that order. (Power BI will add data to the table in the order you click it) Leave out phone – it doesn't help our visualisation today.
It should then populate the table on the dashboard until you see something like this:

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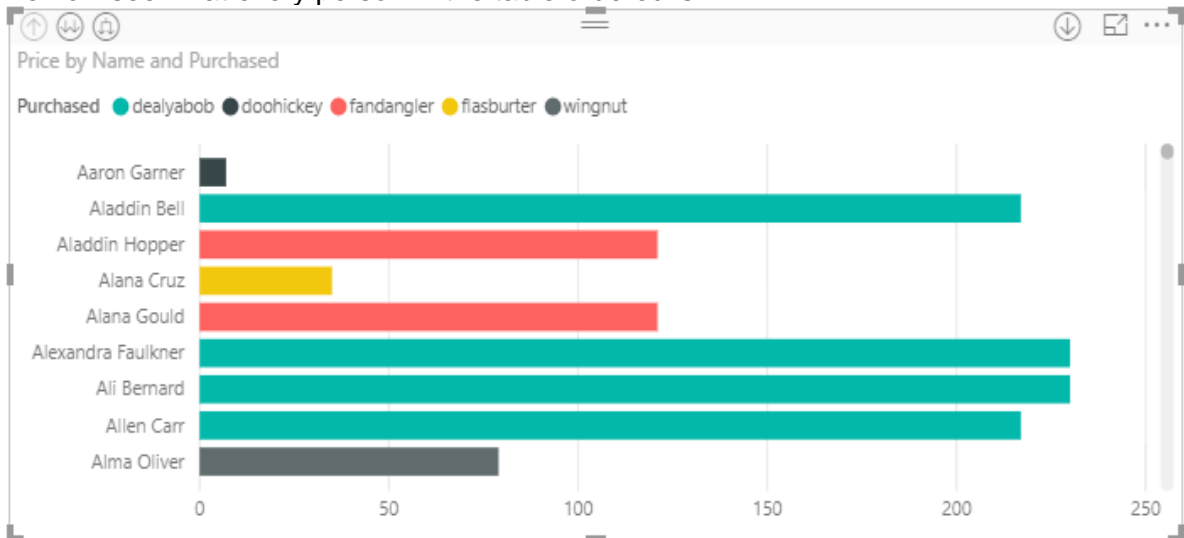
Step 22: Let's try another visualisation. To do that we can **copy this visualisation with ctrl-c and ctrl-v.** When you get the duplicate use the drag bar at the top of the image to pull it away from the old one like this (see overleaf):

Price by Name and Purchased

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..

Price by Name and Purchased
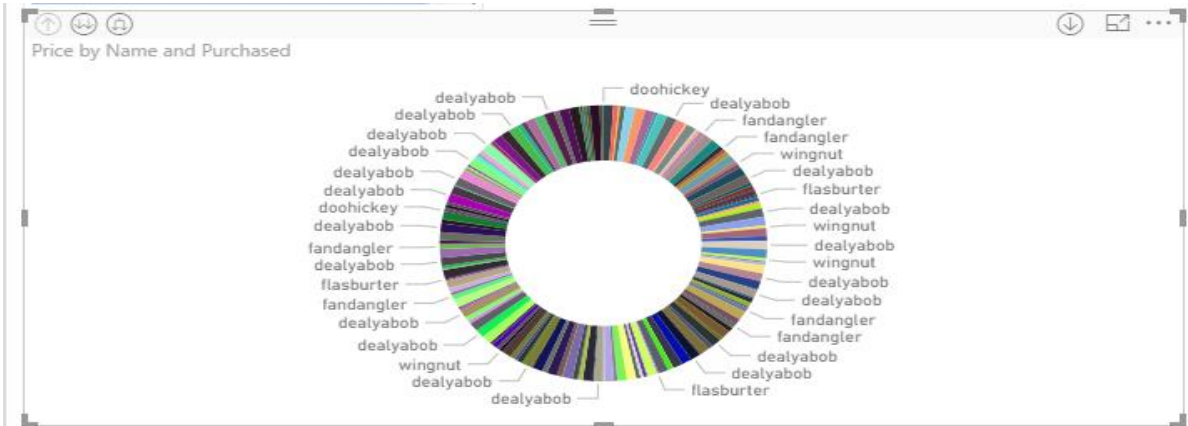
Step 24 - So, let's take out name from the table on the right of screen

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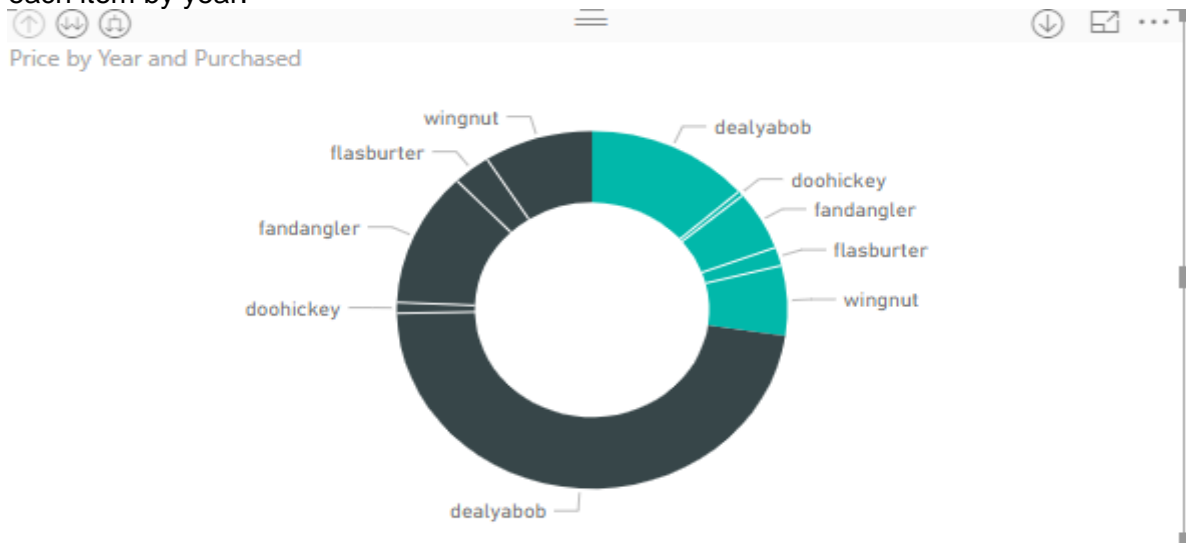
This is a total sales breakdown divided into 2014 and 2015 sales. But what if I wanted to know how much my widgets sold overall? What would I do?

Step 26: That's right – **remove req date as well**. Now we have this:

Price by Purchased
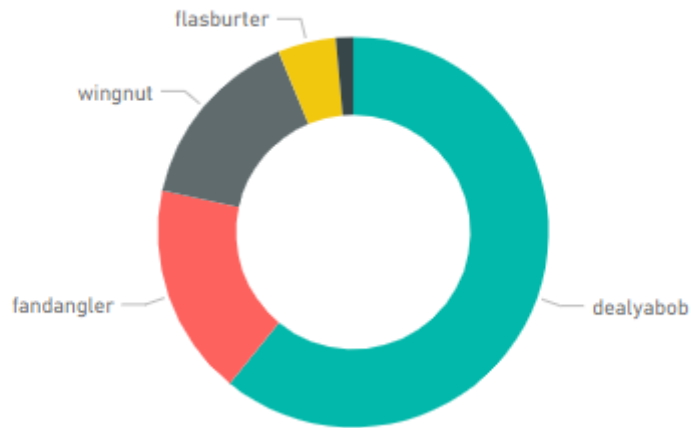
NB: If this doesn't work untick street address and zipcode too and it should work then

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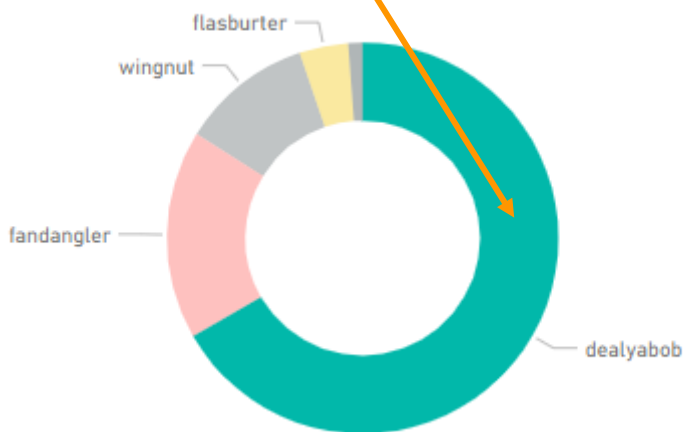
Price by Name and Purchased

Purchased ● dealyabob ● doohickey ● fandangler ● flasburter ● wingnut
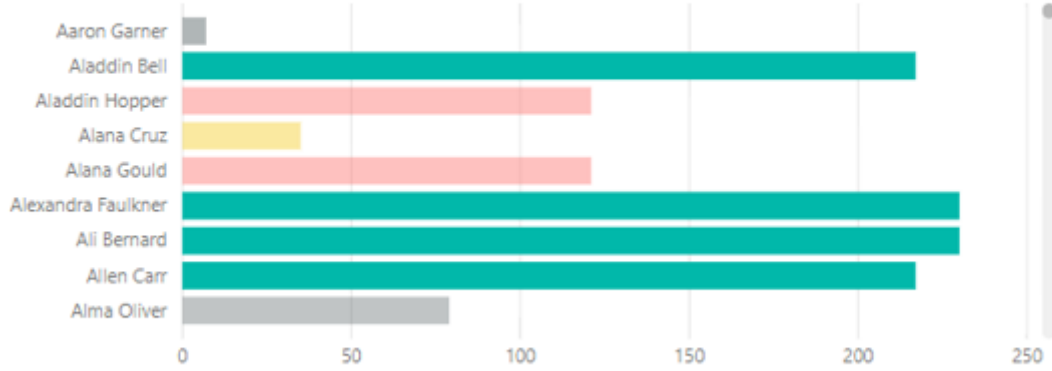
Step 28 –**Whilst still selecting the donut go to the format (paint roller) option** on the right under the visualisation icons

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'**


Voila!

Breakdown of Total Revenue
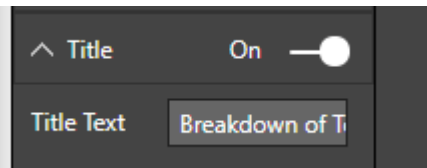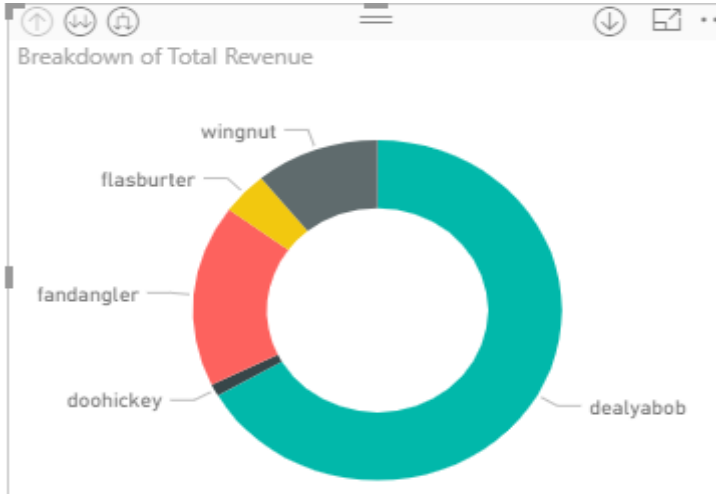
Step 30 – Let's leave that on our dashboard and add another thing. How about we get a figure for the total amount of money we made selling our widgets? **Click in the blank space on our dashboard to unselect all current visualisations. Then, click just price**
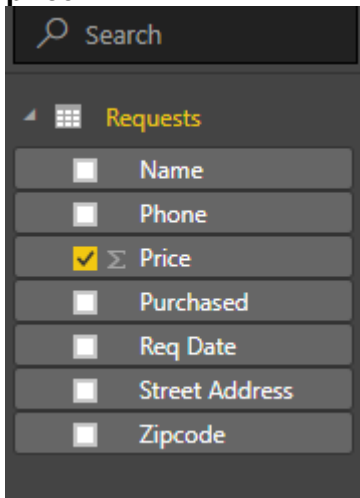
Step 31 – Now we have a bar chart/histograph of the total amount of money we've made selling widgets.
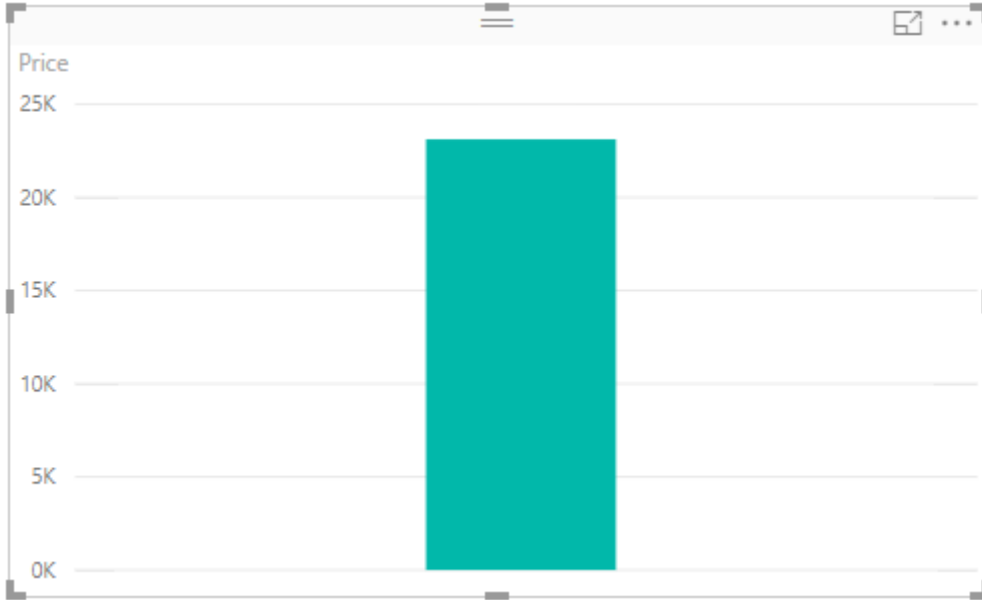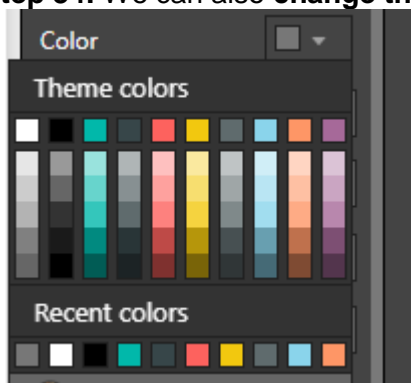
Step 32 – This is cool but we might like to know the exact number. To do this **click the format icon again.**

Step 33: Go down to data labels and turn them on
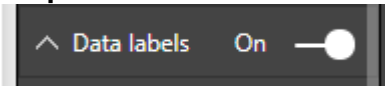
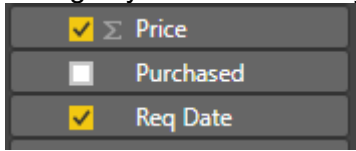**Step 34:** We can also **change the data colour** if we'd like to while we're here
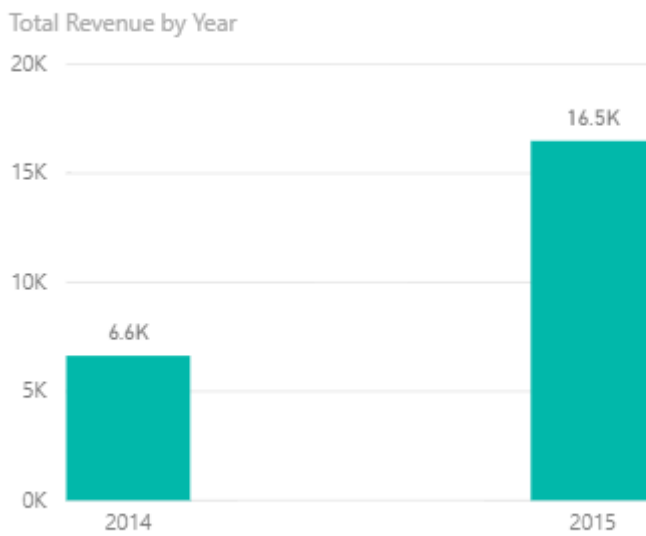

I'll choose salmon coloured. Voila

Step 35: Use title to rename it Total Revenue
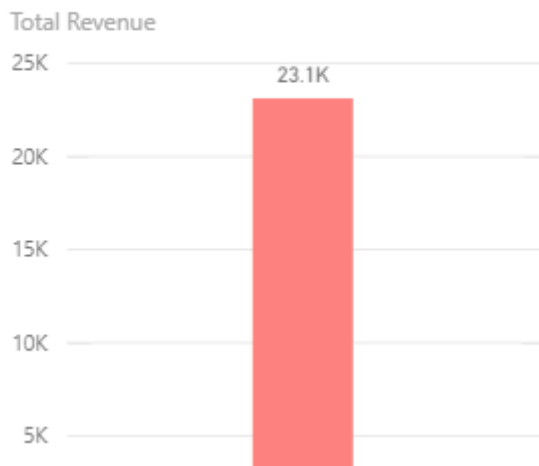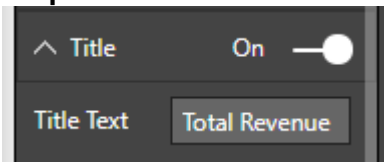
Step 36: If you **click request date to split it into two years** (you will lose any colour changes you've made sadly)

☑ Σ	Price
☐	Purchased
☑	Req Date
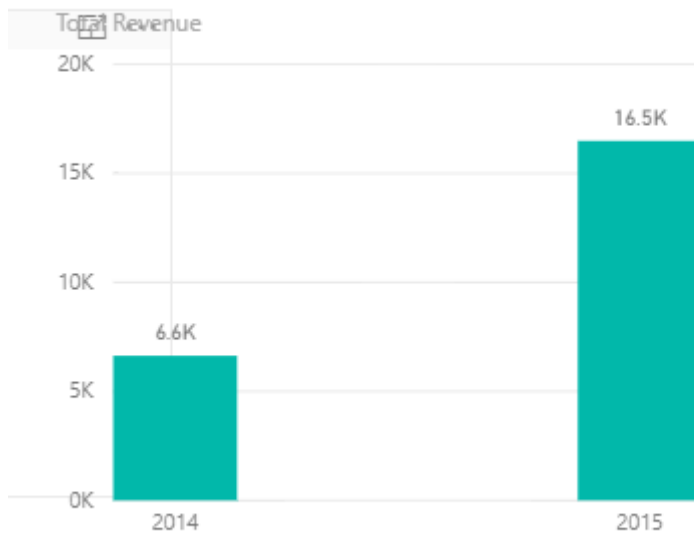
Step 37: Use the format> title option again to change the title to Revenue by year

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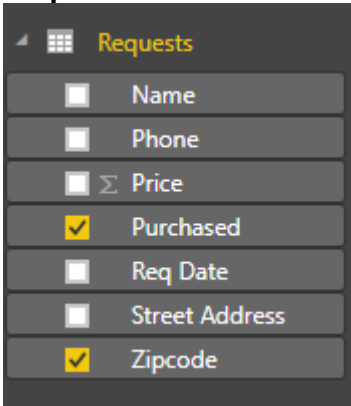
Here are all the places people ordered widgets from. Cool!

Step 40 – One final cool thing to show you is a slicer.

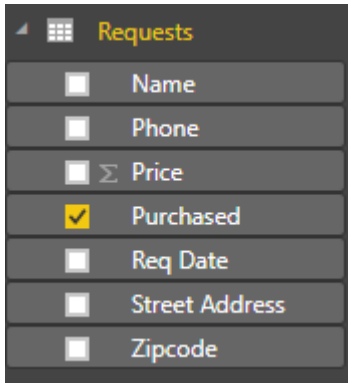**Click out of the map viz** and then **choose the slicer button** -
Here is our blank slicer.
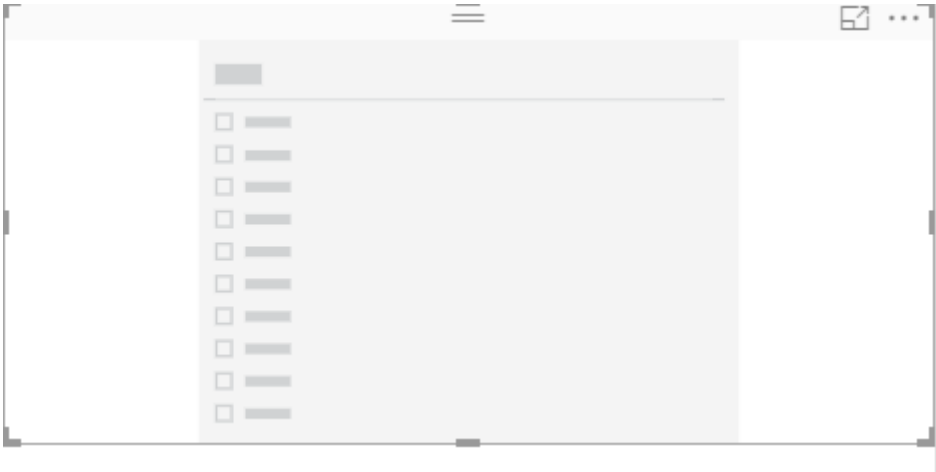
Step 41 - Now let's **assign request date to the slicer**.
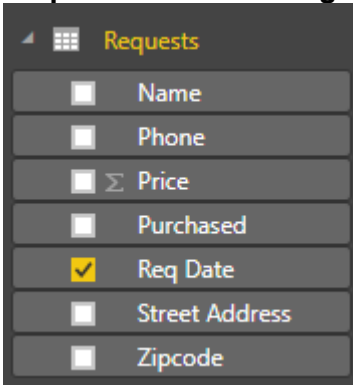

It should create a drag bar like this:

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.**
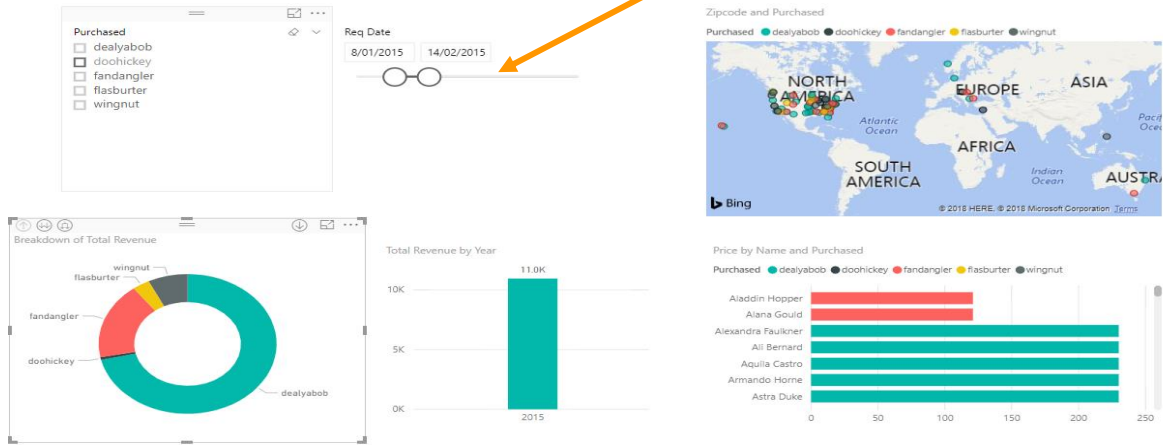
You should see this:
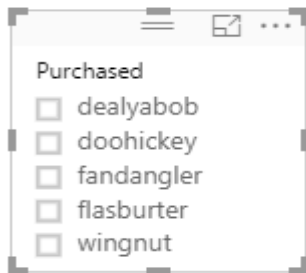
Step 43: Using the drag bars around the images and also the click grab function on the windows, resize them and move them around so that every thing looks nice and in proportion (in this example I've moved my slicers to the top left)
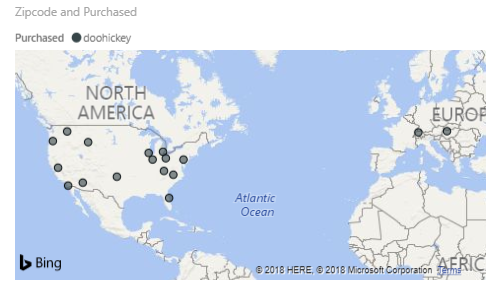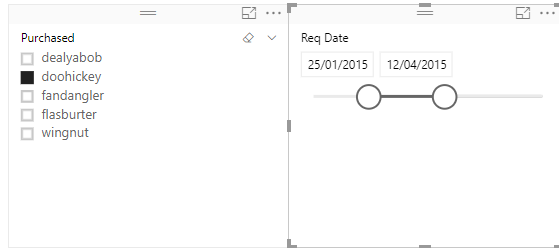See how we are building a dashboard?
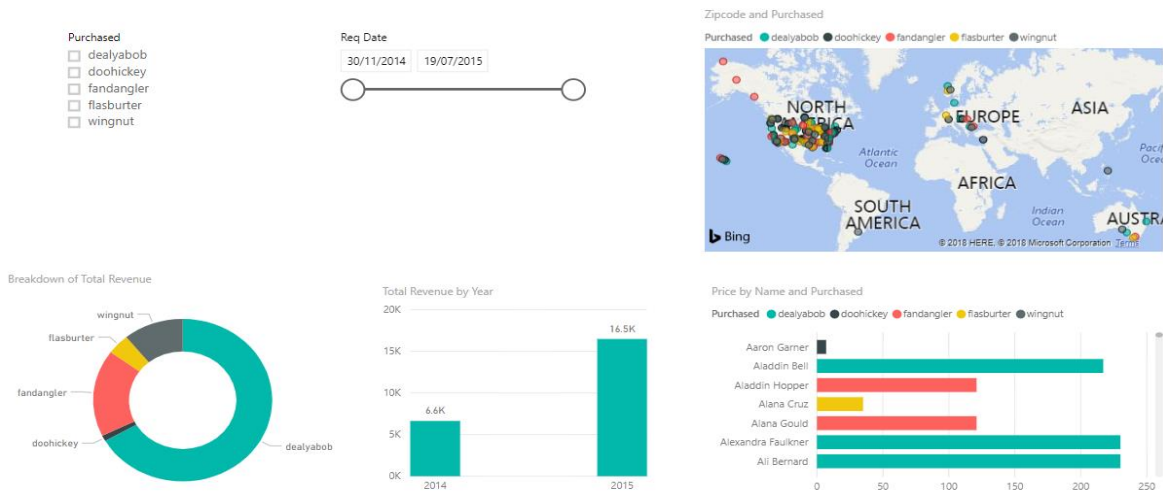
Step 44: Now lets **slice by date using the drag bar**

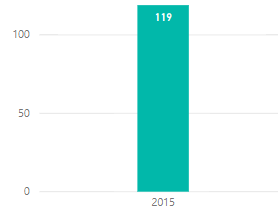
Step 45: Or **slice by product using the product table**. eg: Doohickey
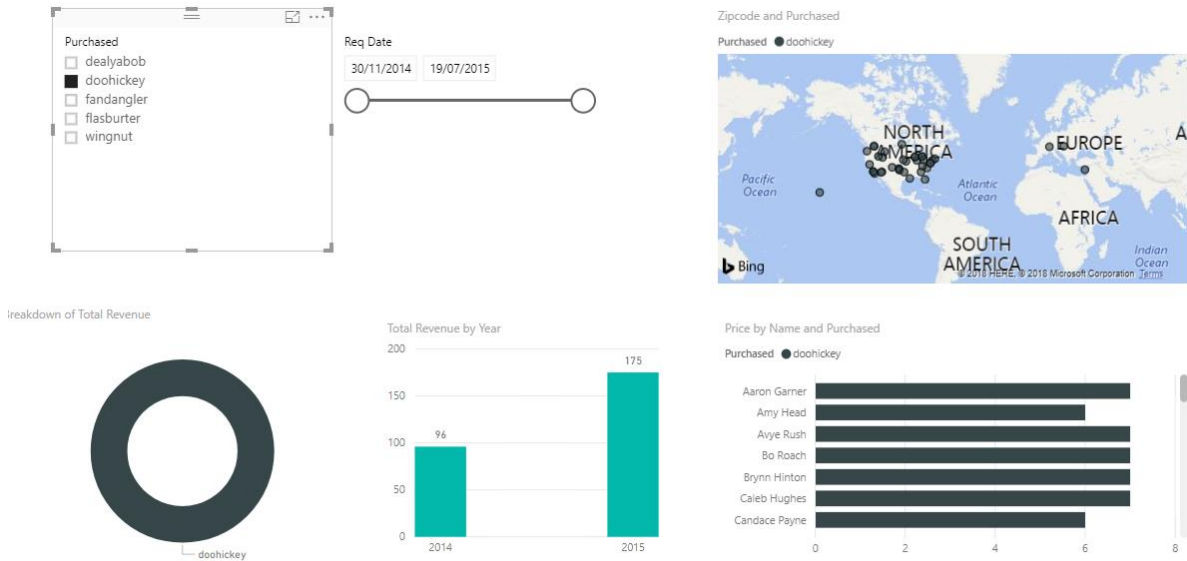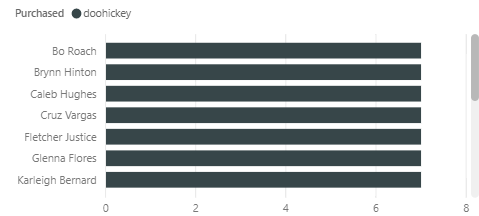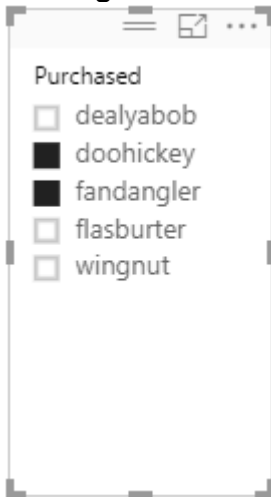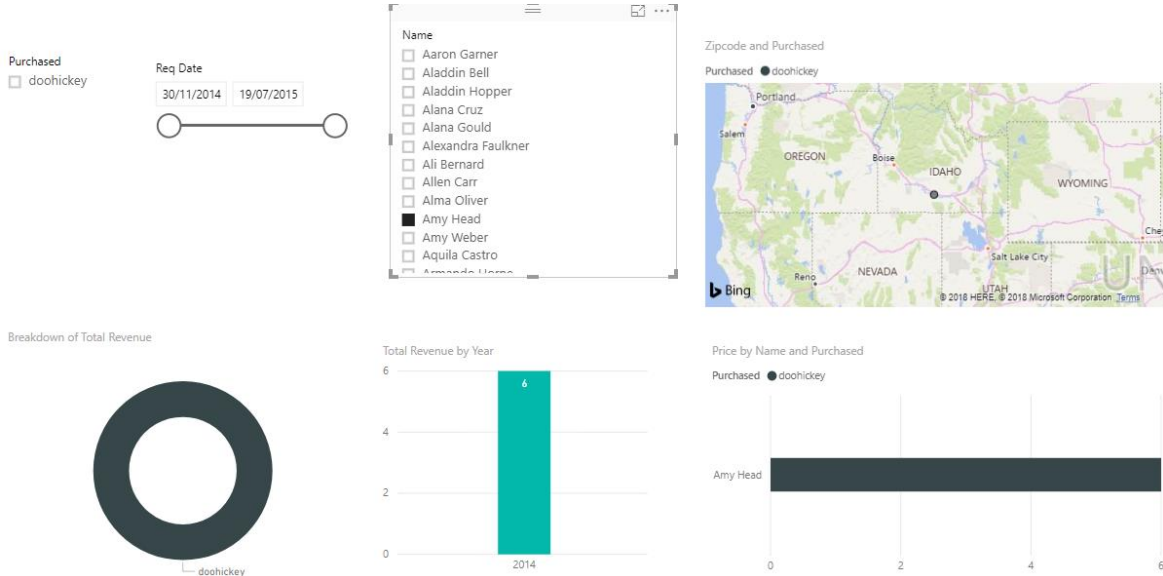
Step 46: Or by doohickey *and* time

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.
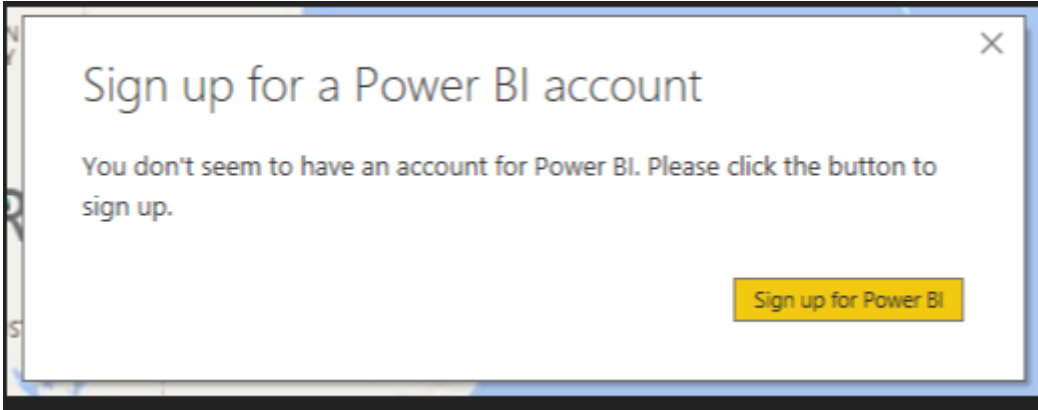

Step 48:. Let's **save our dashboard now using the disc icon in the top right**
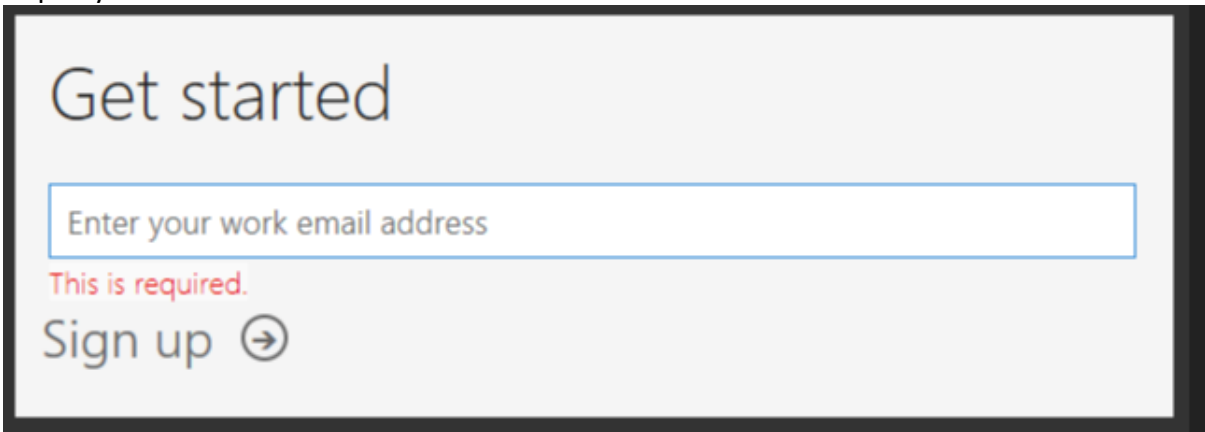

Step 49: Now that we've saved out project let's publish it. This will allow us to view an interactive version of the project on the internet. First thing – click publish
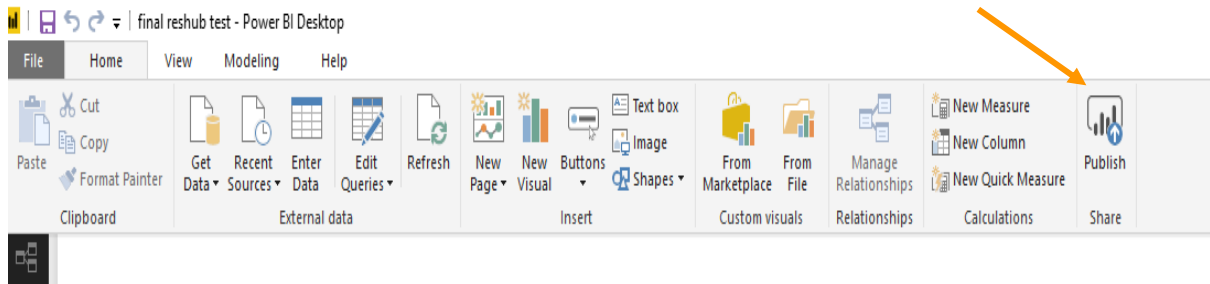
Step 50: If you never completed the signup form when you first opened Power BI desktop you'll have to signup now.
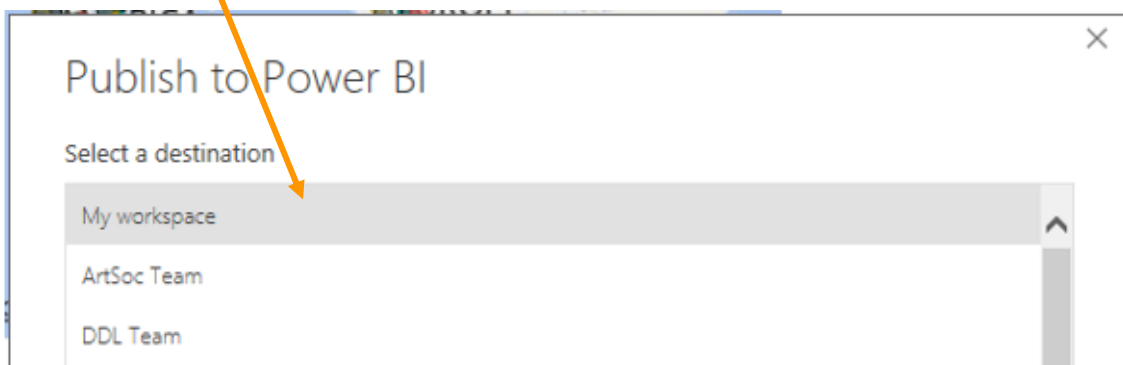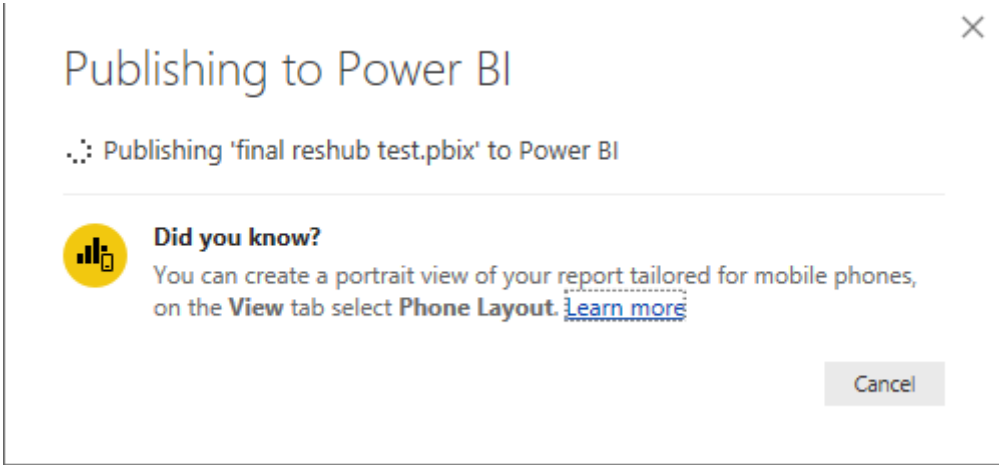
Pop in your UTS email

Step 51: Once you have signed up you should see an option called Publish to Power BI - choose
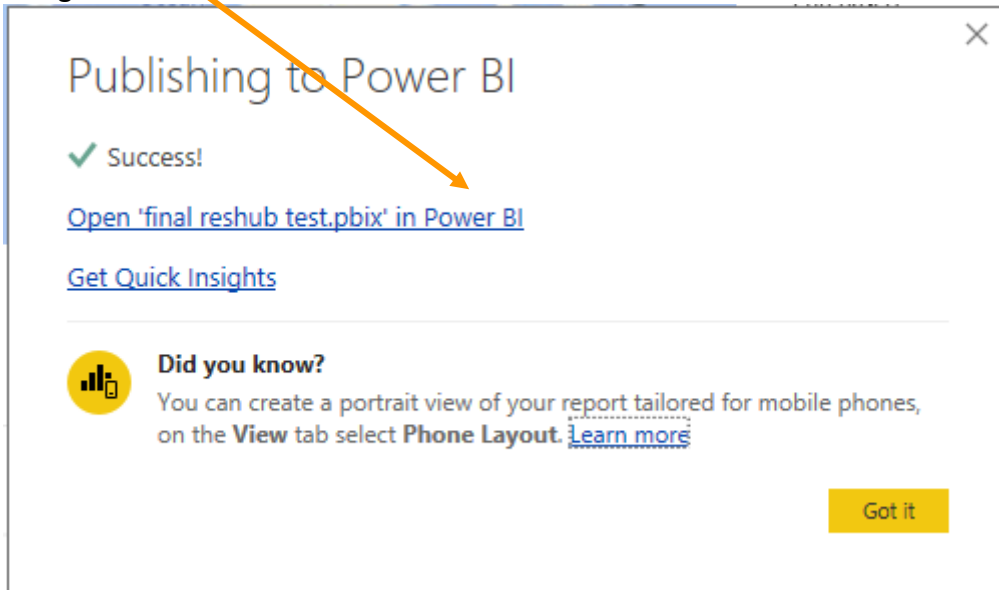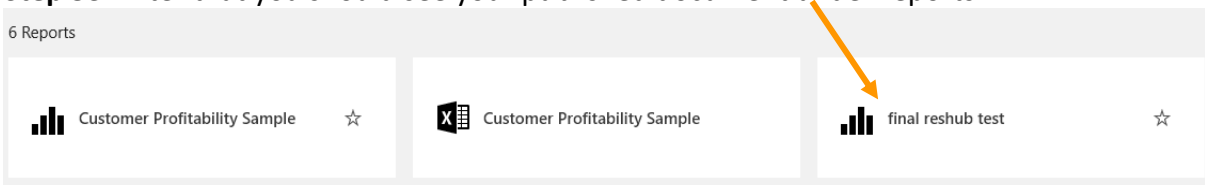**My Workspace** (this is the online version of Power BI)
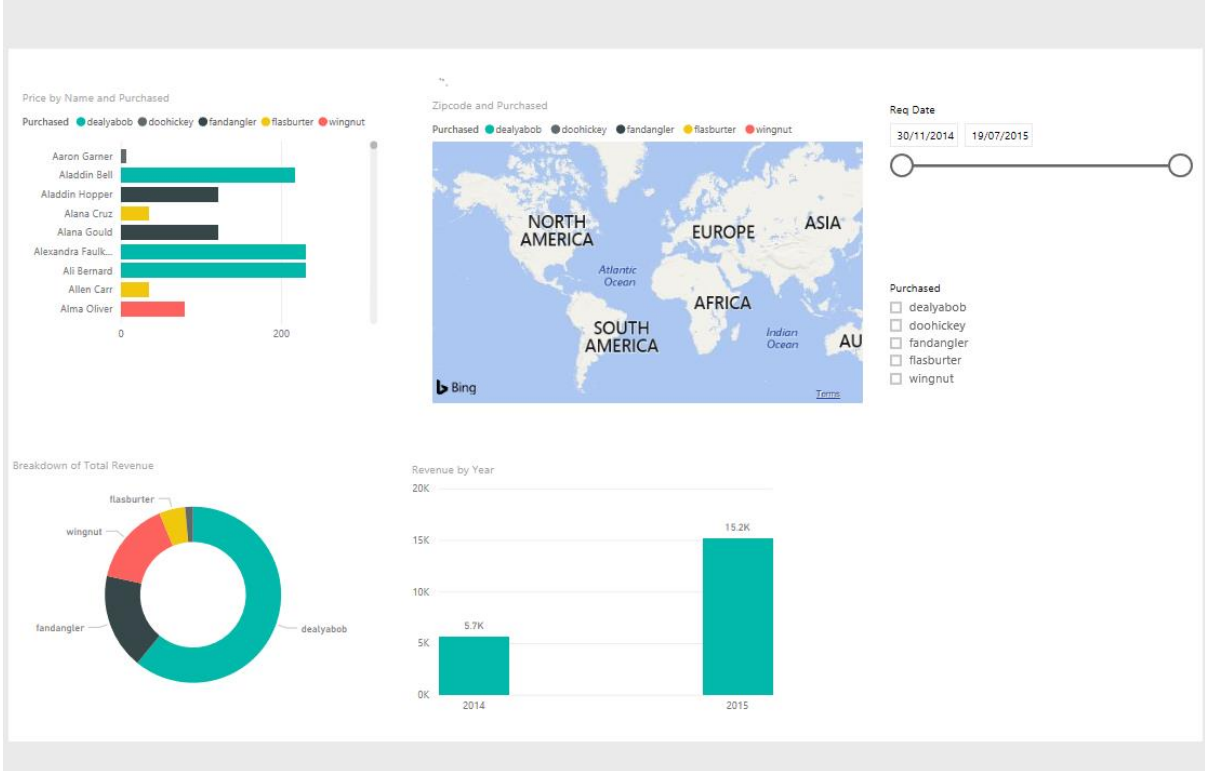
It will then get publishing…

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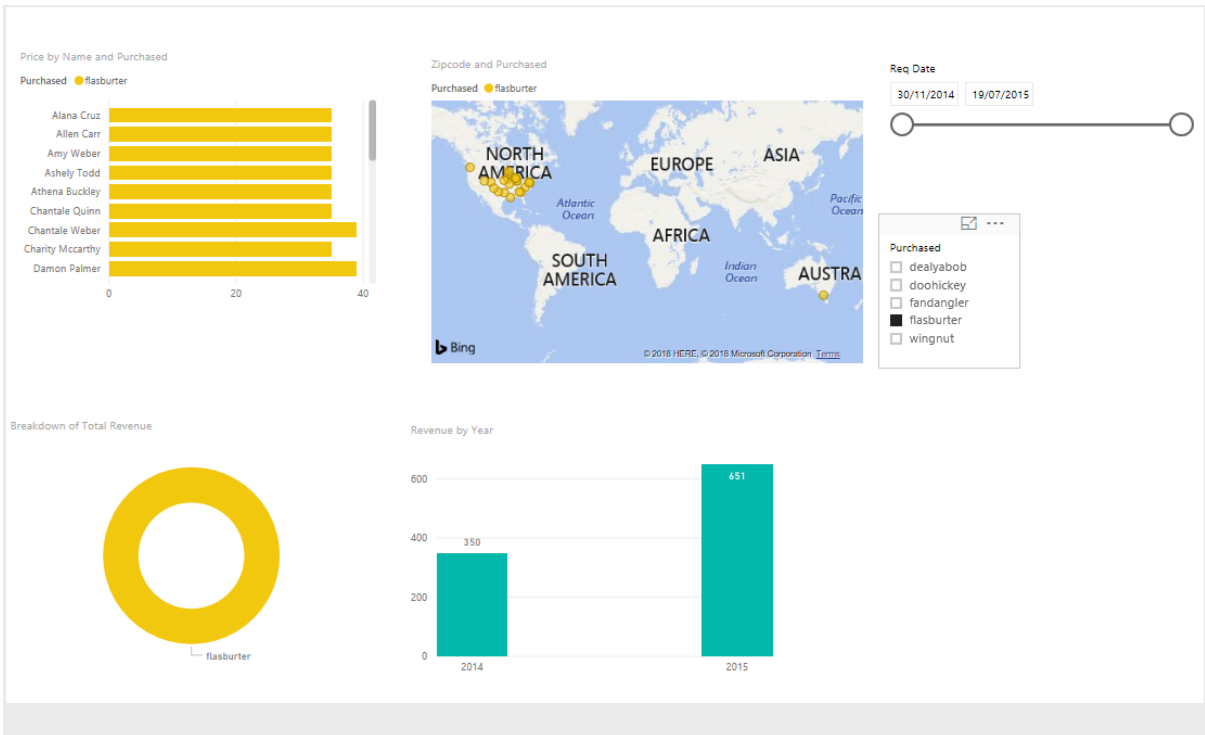

Step 53: After that you should see your published document under reports

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