

# CASE STUDY

Explore a dataset that includes the kind of information in the world of digital marketing. Spot errors in metrics using data validation, use regular expressions to aggregate campaign metrics, build charts to analyze campaign performance, and build a dynamic dashboard!

1.1.1 Fix the formatting in cell A9 so that the cell is valid. Change the values in cells F4 and F19 so that they are no longer flagged.

	A	B	C	D	E	F		A	B	C	D	E	F
1	Entry Date	Source	Campaign Name	Ad Group	Impressions	Clicks	1	Entry Date	Source	Campaign Name	Ad Group	Impressions	Clicks
2	2018-12-17	Bing	Remarketing	Sweaters	161	15	2	2018-12-17	Bing	Remarketing	Sweaters	161	15
3	2019-01-07	Google	Python Brand	Mug Buyers	114	27	3	2019-01-07	Google	Python Brand	Mug Buyers	114	27
4	2018-12-17	Bing	pandas Brand	Mugs	115	nine	4	2018-12-17	Bing	pandas Brand	Mugs	115	9
5	2019-01-07	Google	Competitor	Tee Shirt Buyers	462	26	5	2019-01-07	Google	Competitor	Tee Shirt Buyers	462	26
6	2019-01-07	Google	Competitor	Mug Buyers	169	20	6	2019-01-07	Google	Competitor	Mug Buyers	169	20
7	2019-01-07	Google	DataCamp Brand	Sweater Buyers	189	13	7	2019-01-07	Google	DataCamp Brand	Sweater Buyers	189	13
8	2018-12-17	Bing	Python Brand	Mugs	294	19	8	2018-12-17	Bing	Python Brand	Mugs	294	19
9	2018-12-17	Bing	Competitors	Mugs	248	11	9	2018-12-17	Bing	Competitors	Mugs	248	11
10	2019-01-07	Google	Competitor	Sweater Buyers	296	16	10	2019-01-07	Google	Competitor	Sweater Buyers	296	16
11	2019-01-07	Google	Python Brand	Tee Shirt Buyers	143	15	11	2019-01-07	Google	Python Brand	Tee Shirt Buyers	143	15
12	2019-01-07	Google	Pandas Brand	Sweater Buyers	219	14	12	2019-01-07	Google	Pandas Brand	Sweater Buyers	219	14
13	2018-12-17	Bing	Python Brand	Sweaters	177	14	13	2018-12-17	Bing	Python Brand	Sweaters	177	14
14	2019-01-07	Google	Remarketing - 01	Tee Shirt Buyers	483	27	14	2019-01-07	Google	Remarketing - 01	Tee Shirt Buyers	483	27
15	2019-01-07	Google	Pandas Brand	Mug Buyers	320	21	15	2019-01-07	Google	Pandas Brand	Mug Buyers	320	21
16	2018-12-17	Bing	Competitors	Tee Shirts	207	13	16	2018-12-17	Bing	Competitors	Tee Shirts	207	13
17	2019-01-07	Google	Pandas Brand	Tee Shirt Buyers	158	22	17	2019-01-07	Google	Pandas Brand	Tee Shirt Buyers	158	22
18	2019-01-07	Google	Remarketing - 01	Sweater Buyers	323	15	18	2019-01-07	Google	Remarketing - 01	Sweater Buyers	323	15
19	2018-12-17	Bing	pandas Brand	Tee Shirts	144	seven	19	2018-12-17	Bing	pandas Brand	Tee Shirts	144	7

1.1.2 Enter missing data in row 27 and 28.

26	2019-01-07	Google	Python Brand	Sweater Buyers	183	27	14.75%
27	2019-01-07	Google	DataCamp Brand	Mug Buyers	464	24	5.17%
28	2018-12-17	Bing	DataCamp Branded	Tee Shirts	273	8	2.93%

1.2.1 In cell G3 and G6, enter DataCamp Brand and Remarketing, use the dropdowns to correct the flagged DataCamp and Campaign Name cells.

	A	B	C	D	E	F	G
1	Source	Campaign Name	Ad Group	Impressions	Clicks		Campaign Names
2	Bing	Remarketing	Sweaters	161	15		Competitors
3	Google	Python Brand	Mug Buyers	114	27		DataCamp Brand
4	Bing	pandas Brand	Mugs	115	9		pandas Brand
5	Google	Competitors	Tee Shirt Buyers	462	26		Python Brand
6	Google	Competitors	Mug Buyers	169	20		Remarketing
7	Google	DataCamp Brand	Sweater Buyers	189	13		
8	Bing	Python Brand	Mugs	294	19		

1.2.2 In cells C2 to C28, modify the List of items data validation to include Sweaters and Tee Shirts in place of [Item 2] and [Item 3]. Then correct all the flagged cells

A	B	C	D	A	B	C	D
Source	Campaign Name	Ad Group	Impressions	Source	Campaign Name	Ad Group	Impressions
Bing	Remarketing	Sweaters	161	Bing	Remarketing	Sweaters	161
Google	Python Brand	Mugs	114	Google	Python Brand	Mugs	114
Bing	pandas Brand	[item 2]	115	Bing	pandas Brand	Mugs	115
Google	Competitors	[item 3]	462	Google	Competitors	Tee Shirts	462
Google	Competitors		169	Google	Competitors	Mugs	169
Google	DataCamp Brand	Sweater Buyers	189	Google	DataCamp Brand	Sweaters	189
Bing	Python Brand	Mugs	294	Bing	Python Brand	Mugs	294
Bing	Competitors	Mugs	248	Bing	Competitors	Mugs	248
Google	Competitors	Sweater Buyers	296	Google	Competitors	Sweaters	296
Google	Python Brand	Tee Shirt Buyers	143	Google	Python Brand	Tee Shirts	143
Google	Pandas Brand	Sweater Buyers	219	Google	Pandas Brand	Sweaters	219
Bing	Python Brand	Sweaters	177	Bing	Python Brand	Sweaters	177

1.3.1 Make sure each url and email is valid and correct flagged columns by data validation.

A	B	C	D	E	F	G
Source	Campaign Name	Ad Group	URL	Email	Number of Ads	Inactive
Bing	Remarketing	Sweaters	<a href="https://datacamp.com/sweaters">datacamp.com/sweaters</a>	paid-search18@datacamp.com	7	
Google	Python Brand	Mugs	<a href="https://datacamp.com/mugs">datacamp.com/mugs</a>	googleads@datacamp.com	4	
Bing	pandas Brand	Mugs	<a href="https://datacamp.com/mugs">datacamp.com/mugs</a>	bingads@datacamp.com	3	
Google	Competitors	Tee Shirts	<a href="https://datacamp.com/tee-shirts">datacamp.com/tee-shirts</a>	paid-search18@datacamp.com	3	
Google	Competitors	Mugs	<a href="https://datacamp.com/mugs">datacamp.com/mugs</a>	paid-search18@datacamp.com	5	
Google	DataCamp Brand	Sweaters	<a href="https://datacamp.com/sweaters">datacamp.com/sweaters</a>	paid-search18@datacamp.com	5	
Bing	Python Brand	Mugs	<a href="https://datacamp.com/mugs">datacamp.com/mugs</a>	bingads@datacamp.com	7	
Bing	Competitors	Mugs	<a href="https://datacamp.com/mugs">datacamp.com/mugs</a>	paid-search18@datacamp.com	5	
Google	Competitors	Sweaters	<a href="https://datacamp.com/sweaters">datacamp.com/sweaters</a>	paid-search18@datacamp.com	6	
Google	Python Brand	Tee Shirts	<a href="https://datacamp.com/tee-shirts">datacamp.com/tee-shirts</a>	google ads@datacamp.com	Invalid: Input must be a valid email address	
Google	Pandas Brand	Sweaters	<a href="https://datacamp.com/sweaters">datacamp.com/sweaters</a>	googleads@datacamp.com		
Bing	Python Brand	Sweaters	<a href="https://datacamp.com/sweaters">datacamp.com/sweaters</a>	bingads@datacamp.com		
Google	Remarketing	Tee Shirts	<a href="https://datacamp.com/tee-shirts">datacamp.com/tee-shirts</a>	paid-search18@datacamp.com		
Google	Pandas Brand	Mugs	<a href="https://datacamp.com/mugs">datacamp.com/mugs</a>	googleads@datacamp.com		
Bing	Competitors	Tee Shirts	<a href="https://datacamp.com/tee-shirts">datacamp.com/tee-shirts</a>	paid-search18@datacamp.com	1	

A	B	C	D	E	F
Source	Campaign Name	Ad Group	URL	Email	Number of Ads
Bing	Remarketing	Sweaters	<a href="https://datacamp.com/sweaters">datacamp.com/sweaters</a>	paid-search18@datacamp.com	7
Google	Python Brand	Mugs	<a href="https://datacamp.com/mugs">datacamp.com/mugs</a>	googleads@datacamp.com	4
Bing	pandas Brand	Mugs	<a href="https://datacamp.com/mugs">datacamp.com/mugs</a>	bingads@datacamp.com	3
Google	Competitors	Tee Shirts	<a href="https://datacamp.com/tee-shirts">datacamp.com/tee-shirts</a>	paid-search18@datacamp.com	3
Google	Competitors	Mugs	<a href="https://datacamp.com/mugs">datacamp.com/mugs</a>	paid-search18@datacamp.com	5
Google	DataCamp Brand	Sweaters	<a href="https://datacamp.com/sweaters">datacamp.com/sweaters</a>	paid-search18@datacamp.com	5
Bing	Python Brand	Mugs	<a href="https://datacamp.com/mugs">datacamp.com/mugs</a>	bingads@datacamp.com	7
Bing	Competitors	Mugs	<a href="https://datacamp.com/mugs">datacamp.com/mugs</a>	paid-search18@datacamp.com	5
Google	Competitors	Sweaters	<a href="https://datacamp.com/sweaters">datacamp.com/sweaters</a>	paid-search18@datacamp.com	6
Google	Python Brand	Tee Shirts	<a href="https://datacamp.com/tee-shirts">datacamp.com/tee-shirts</a>	googleads@datacamp.com	7
Google	Pandas Brand	Sweaters	<a href="https://datacamp.com/sweaters">datacamp.com/sweaters</a>	googleads@datacamp.com	1
Bing	Python Brand	Sweaters	<a href="https://datacamp.com/sweaters">datacamp.com/sweaters</a>	bingads@datacamp.com	1
Google	Remarketing	Tee Shirts	<a href="https://datacamp.com/tee-shirts">datacamp.com/tee-shirts</a>	paid-search18@datacamp.com	7
Google	Pandas Brand	Mugs	<a href="https://datacamp.com/mugs">datacamp.com/mugs</a>	googleads@datacamp.com	5

1.3.2 Add a Checkbox data validation to the cells on the Inactive column, checked: active, unchecked: inactive. Mark all ad groups without ads as Inactive,

D	E	F	G
URL	Email	Number of Ads	Inactive
<a href="#">datacamp.com/sweaters</a>	paid-search18@datacamp.com	7	<input type="checkbox"/>
<a href="#">datacamp.com/mugs</a>	googleads@datacamp.com	4	<input type="checkbox"/>
<a href="#">datacamp.com/mugs</a>	bingads@datacamp.com	3	<input type="checkbox"/>
<a href="#">datacamp.com/tee-shirts</a>	paid-search18@datacamp.com	3	<input type="checkbox"/>
<a href="#">datacamp.com/mugs</a>	paid-search18@datacamp.com	5	<input type="checkbox"/>
<a href="#">datacamp.com/sweaters</a>	paid-search18@datacamp.com	5	<input type="checkbox"/>
<a href="#">datacamp.com/mugs</a>	bingads@datacamp.com	7	<input type="checkbox"/>
<a href="#">datacamp.com/mugs</a>	paid-search18@datacamp.com	5	<input type="checkbox"/>
<a href="#">datacamp.com/sweaters</a>	paid-search18@datacamp.com	6	<input type="checkbox"/>
<a href="#">datacamp.com/tee-shirts</a>	googleads@datacamp.com	7	<input type="checkbox"/>
<a href="#">datacamp.com/sweaters</a>	googleads@datacamp.com	1	<input type="checkbox"/>
<a href="#">datacamp.com/sweaters</a>	bingads@datacamp.com	1	<input type="checkbox"/>
<a href="#">datacamp.com/tee-shirts</a>	paid-search18@datacamp.com	7	<input type="checkbox"/>
<a href="#">datacamp.com/mugs</a>	googleads@datacamp.com	5	<input type="checkbox"/>
<a href="#">datacamp.com/tee-shirts</a>	paid-search18@datacamp.com	1	<input type="checkbox"/>
<a href="#">datacamp.com/tee-shirts</a>	bingads@datacamp.com	6	<input type="checkbox"/>
<a href="#">datacamp.com/sweaters</a>	paid-search18@datacamp.com	4	<input type="checkbox"/>
<a href="#">datacamp.com/tee-shirts</a>	bingads@datacamp.com	0	<input checked="" type="checkbox"/>

1.3.3 Create a list of items dropdown for the Source column, with Google and Bing (in this order) as the dropdown values.

	A	B	C	D
1	Source	Campaign Name	Ad Group	Impressions
2	Bingo	Remarketing	Sweaters	161
3	Google	Python Brand	Mug Buyers	114
4	Bing	pandas Brand	Mugs	115
5	Google	Competitor	Tee Shirt Buyers	462
6	Google	Competitor	Mug Buyers	169
7	Google	DataCamp Brand	Sweater Buyers	189
8	Bing	Python Brand	Mugs	294
9	Bing	Competitors	Mugs	248
10	Google	Competitor	Sweater Buyers	296
11	Google	Python Brand	Tee Shirt Buyers	143
12	Google	Pandas Brand	Sweater Buyers	219
13	Bing	Python Brand	Sweaters	177
14	Google	Remarketing - 01	Tee Shirt Buyers	483
15	Google	Pandas Brand	Mug Buyers	320

	A	B	C	D	E
1	Source	Campaign Name	Ad Group	Impressions	Clicks
2	Bing	Remarketing	Sweaters	161	15
3	Google	Python Brand	Mug Buyers	114	27
4	Bing	pandas Brand	Mugs	115	9
5	Google	Competitor	Tee Shirt Buyers	462	26
6	Google	Competitor	Mug Buyers	169	20
7	Google	DataCamp Brand	Sweater Buyers	189	13
8	Bing	Python Brand	Mugs	294	19
9	Bing	Competitors	Mugs	248	11
10	Google	Competitor	Sweater Buyers	296	16
11	Google	Python Brand	Tee Shirt Buyers	143	15
12	Google	Pandas Brand	Sweater Buyers	219	14
13	Bing	Python Brand	Sweaters	177	14
14	Google	Remarketing - 01	Tee Shirt Buyers	483	27
15	Google	Pandas Brand	Mug Buyers	320	21
16	Bing	Competitors	Tee Shirts	207	13

2.1.1 Write a regular expression in cell H3 that will include all of the campaigns that begin with the character p or P. In cell H4, write a regular expression that will include any campaign that ends with the letter d. For cell H5, write a regular expression that will select ad groups Mugs and Sweaters.

A	B	C	D	E	F	G	H
Source	Campaign Name	Ad Group	Cost	CPC			Regular Expression
Bing	Remarketing	Sweaters	\$46.91	3.13			
Google	Python Brand	Mugs	\$45.70	1.69	Campaign Name starts with the letter p (or P):		^[pP].*
Bing	pandas Brand	Mugs	\$43.77	4.86	Campaign Name ends with the letter d:		.*d\$
Google	Competitors	Tee Shirts	\$43.39	1.67	Ad Group is Mugs or Sweaters:		Mugs Sweaters

2.2.1 Write the appropriate regular expression in cell H2 that will return all competitor campaigns (i.e. campaign names containing Competitors or Competitor). In cell G5, add the REGEXMATCH() function using the campaigns column as the cells of interest and cell H2 as the regular expression and filter the whole table.

C	D	E	F	G	H	I	J	K
<b>Ad Group</b>	<b>Cost</b>	<b>CPC</b>						
Sweaters	\$46.91	3.13			Regex: Competitors?			
Mugs	\$45.70	1.69						
Mugs	\$43.77	4.86		<b>Source</b>	<b>Campaign Name</b>	<b>Ad Group</b>	<b>Cost</b>	<b>CPC</b>
Tee Shirts	\$43.39	1.67		Google	Competitors	Tee Shirts	\$43.39	\$1.67
Mugs	\$42.23	2.11		Google	Competitors	Mugs	\$42.23	\$2.11
Sweaters	\$39.68	3.05		Bing	Competitors	Mugs	\$38.93	\$3.54
Mugs	\$39.06	2.06		Google	Competitor	Sweaters	\$36.59	\$2.29
Mugs	\$38.93	3.54		Bing	Competitors	Tee Shirts	\$29.45	\$2.27
Sweaters	\$36.59	2.29		Bing	Competitors	Sweaters	\$12.97	\$1.08

2.2.2 Add a regular expression in cell H4 that will match the respective campaign listed in the cell G4 (i.e. Python campaigns). Calculate the sum of filtered cost by G4.

A	B	C	D	E	F	G	H	I
<b>Source</b>	<b>Campaign Name</b>	<b>Ad Group</b>	<b>Cost</b>	<b>CPC</b>				
Bing	Remarketing	Sweaters	\$46.91	\$3.13			<b>Regex</b>	<b>Cost</b>
Google	Python Brand	Mugs	\$45.70	\$1.69		DataCamp Brand	Data.*	\$125.10
Bing	pandas Brand	Mugs	\$43.77	\$4.86		Python Brand	Python.*	\$176.64

2.2.3 Add regular expressions in cells H3 and H4 that will match the respective ad groups listed in cells G3 and G4, calculate the average CPC filtered by H3 and H4.

fx   =AVERAGE(FILTER(E2:E29,REGEXMATCH(C2:C29,H3)))									
	A	B	C	D	E	F	G	H	I
1	Source	Campaign Name	Ad Group	Cost	CPC				
2	Bing	Remarketing	Sweaters	\$46.91	\$3.13			Regex	CPC
3	Google	Python Brand	Mugs	\$45.70	\$1.69		Mugs and Tee Shirts	Mugs Tee Shirts	\$1.92
4	Bing	pandas Brand	Mugs	\$43.77	\$4.86		Mugs and Sweaters	Mugs Sweaters	\$2.08
5	Google	Competitors	Tee Shirts	\$43.39	\$1.67				

2.3.1 add an IF() statement: test if cell B2 contains the pattern in \$I\$2 using REGEXMATCH(). Return 'branded' if true, return tested cell if false.

fx   =IF(REGEXMATCH(B2,\$I\$2), REGEXREPLACE(B2, \$I\$2, "Branded"), B2)									
	A	B	C	D	E	F	G	H	I
1	Source	Campaign Name	Ad Group	Cost	CPC	Replace			
2	Bing	Remarketing	Sweaters	\$46.91	\$3.13	Remarketing		Regex:	Brand
3	Google	Python Brand	Mugs	\$45.70	\$1.69	Python Branded			
4	Bing	pandas Brand	Mugs	\$43.77	\$4.86	pandas Branded			
5	Google	Competitors	Tee Shirts	\$43.39	\$1.67	Competitors			
6	Google	Competitors	Mugs	\$42.23	\$2.11	Competitors			

2.3.2 Write a regular expression in cell I2 that will match the trailing s in words like Mugs and Sweaters. Test if cell C2 contains your trailing s pattern \$I\$2, return tested cell + buyers if true, return 'No Match' if false.

fx =IF(REGEXMATCH(C2,\$I\$2),REGEXREPLACE(C2,\$I\$2," Buyers"),"No Match")									
	A	B	C	D	E	F	G	H	I
1	Source	Campaign Name	Ad Group	Cost	CPC	Replace			
2	Bing	Remarketing	Sweaters	\$46.91	\$3.13	Sweater Buyers		Regex: s\$	
3	Google	Python Brand	Mugs	\$45.70	\$1.69	Mug Buyers			
4	Bing	pandas Brand	Mugs	\$43.77	\$4.86	Mug Buyers			
5	Google	Competitors	Tee Shirts	\$43.39	\$1.67	Tee Shirt Buyers			

2.3.3 Write regular expression in I2 that will match any branded campaign, write another regular expression to extract the group of characters not equal to Brand in I3. If column B matches I2, return cell B, return cell B extracted 'Brand' of false.

fx =IF(REGEXMATCH(B2,\$I\$2),REGEXEXTRACT(B2,\$I\$3),B2)									
	A	B	C	D	E	F	G	H	I
1	Source	Campaign Name	Ad Group	Cost	CPC	Extract			
2	Bing	Remarketing	Sweaters	\$46.91	\$3.13	Remarketing		Match Regex:	Brand
3	Google	Python Brand	Mugs	\$45.70	\$1.69	Python		Extract Regex:	(.*)Brand
4	Bing	pandas Brand	Mugs	\$43.77	\$4.86	pandas			
5	Google	Competitors	Tee Shirts	\$43.39	\$1.67	Competitors			

2.3.4 In cell I2, write a regular expression that will extract only the first character in a string. In F, write a formula to extract the first character of A column + '\_' + B column.

fx =REGEXEXTRACT(A2,\$I\$2)&"_"&B2									
	A	B	C	D	E	F	G	H	I
1	Source	Campaign Name	Ad Group	Cost	CPC	Extract			
2	Bing	Remarketing	Sweaters	\$46.91	\$3.13	B_Remarketing		Regex Extract:	^.
3	Google	Python	Mugs	\$45.70	\$1.69	G_Python			
4	Bing	pandas	Mugs	\$43.77	\$4.86	B_pandas			

2.4.1 Add a regular expression in cell I2 that will extract the first three characters of a string. Extract the first 3 characters of column A + column B.

fx =REGEXEXTRACT(A2,\$I\$2)&"_"&B2									
	A	B	C	D	E	F	G	H	I
1	Source	Campaign ID	Cost	CPC	Full ID				
2	Bing	Remarketing_Swe	\$46.91	\$3.13	Bin_Remarketing_Swe			Regex Extract:	(^{3})
3	Google	Python_Mug	\$45.70	\$1.69	Goo_Python_Mug				
4	Bing	pandas_Mug	\$43.77	\$4.86	Bin_pandas_Mug				
5	Google	Competitors_Tee	\$43.39	\$1.67	Goo_Competitors_Tee				



2.4.2 Add regular expressions in the cell G3 to match any campaign that has the source of Google. Calculate total spent on the source Google and Bing.

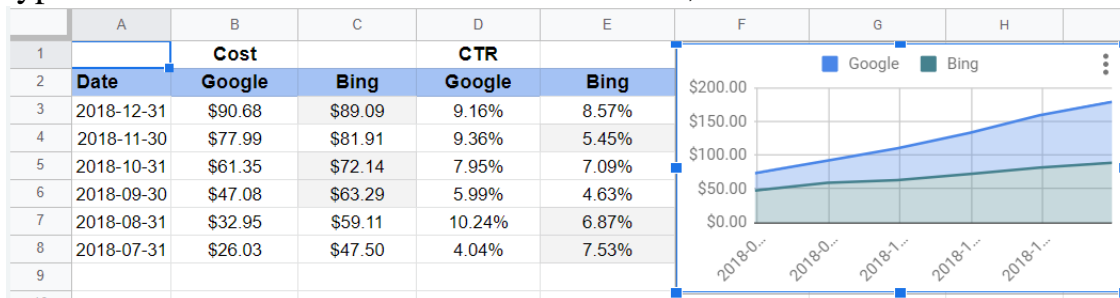
fx   =SUM(FILTER(A2:B29,REGEXMATCH(A2:A29,G2)))									
	A	B	C	D	E	F	G	H	I
1	Full ID	Cost	CPC						
2	Bin_Remarketing_Swe	\$46.91	\$3.13			Regex Match Bing:	^B.*	Regex Extract: (^.{3})	
3	Goo_Python_Mug	\$45.70	\$1.69			Regex Match Google:	^G.*		
4	Bin_pandas_Mug	\$43.77	\$4.86						
5	Goo_Competitors_Tee	\$43.39	\$1.67						
6	Goo_Competitors_Mug	\$42.23	\$2.11						
7	Goo_DataCamp_Swe	\$39.68	\$3.05				Total Cost		
8	Bin_Python_Mug	\$39.06	\$2.06			Bing	\$359.32		
9						Google	\$438.69		

2.4.3 Write the regular expression that will match the campaign and its variants in the cells F3:F6. Find the total for each campaign and the average CPC.

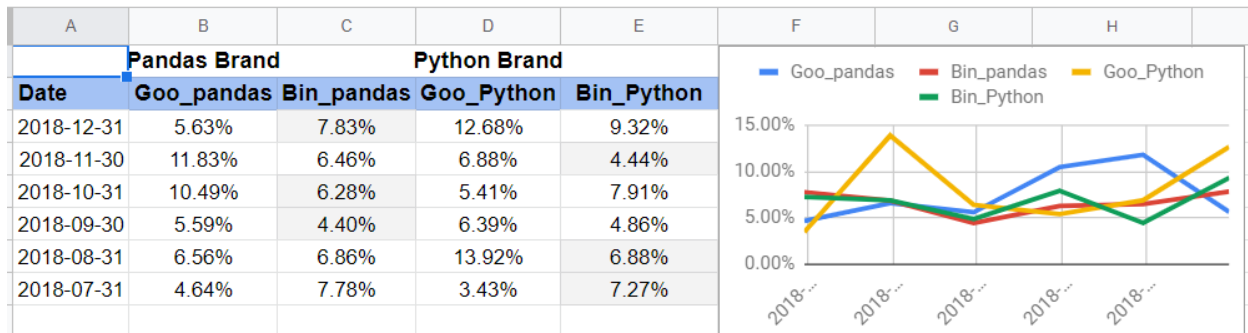
fx   =SUM(FILTER(\$B\$2:\$B\$29,REGEXMATCH(\$A\$2:\$A\$29,F2)))								
	A	B	C	D	E	F	G	H
1	Full ID	Cost	CPC		Campaign	REGEX	Cost	CPC
2	Bin_Remarketing_Swe	\$46.91	\$3.13		DataCamp Brand	DataCamp.*	\$125.10	\$1.86
3	Goo_Python_Mug	\$45.70	\$1.69		Python Brand	Python	\$176.64	\$1.61
4	Bin_pandas_Mug	\$43.77	\$4.86		pandas Brand	[p]Pandas	\$177.24	\$2.38
5	Goo_Competitors_Tee	\$43.39	\$1.67		Competitors	Competitors	\$203.55	\$2.16
6	Goo_Competitors_Mug	\$42.23	\$2.11		Remarketing	Remarketing	\$115.48	\$1.64
7	Goo_DataCamp_Swe	\$39.68	\$3.05					

fx   =AVERAGE(FILTER(\$C\$2:\$C\$29,REGEXMATCH(\$A\$2:\$A\$29,F2)))								
	A	B	C	D	E	F	G	H
1	Full ID	Cost	CPC		Campaign	REGEX	Cost	CPC
2	Bin_Remarketing_Swe	\$46.91	\$3.13		DataCamp Brand	DataCamp.*	\$125.10	\$1.86
3	Goo_Python_Mug	\$45.70	\$1.69		Python Brand	Python	\$176.64	\$1.61
4	Bin_pandas_Mug	\$43.77	\$4.86		pandas Brand	[p]Pandas	\$177.24	\$2.38
5	Goo_Competitors_Tee	\$43.39	\$1.67		Competitors	Competitors	\$203.55	\$2.16
6	Goo_Competitors_Mug	\$42.23	\$2.11		Remarketing	Remarketing	\$115.48	\$1.64
7	Goo_DataCamp_Swe	\$39.68	\$3.05					

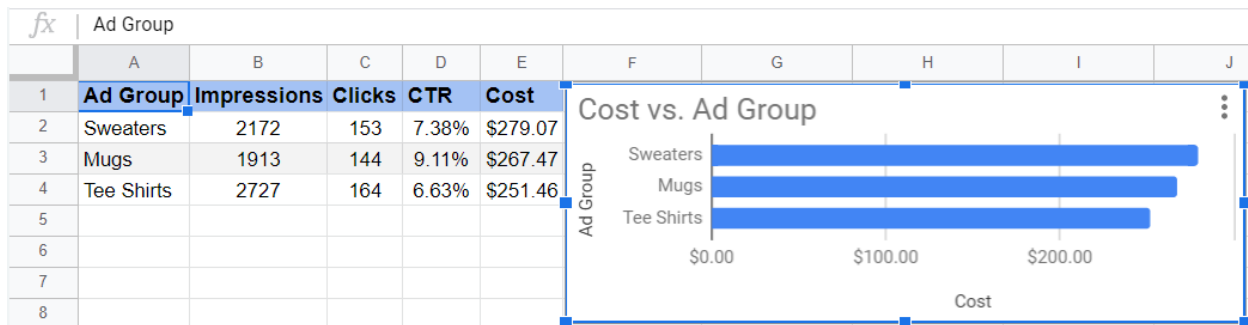
3.1.1 Add the cost column for Google to the chart as another series. Modify the chart type to be a stacked area chart, instead of an area chart.



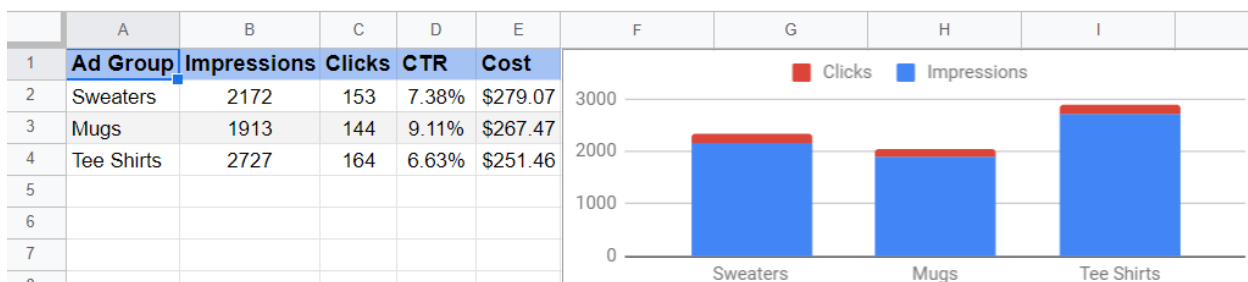
3.1.2 Add the Python Brand campaign with the source of Google as a series. Also add the Python Brand campaign with the source of Bing to the chart. Change the chart type to a Line chart.



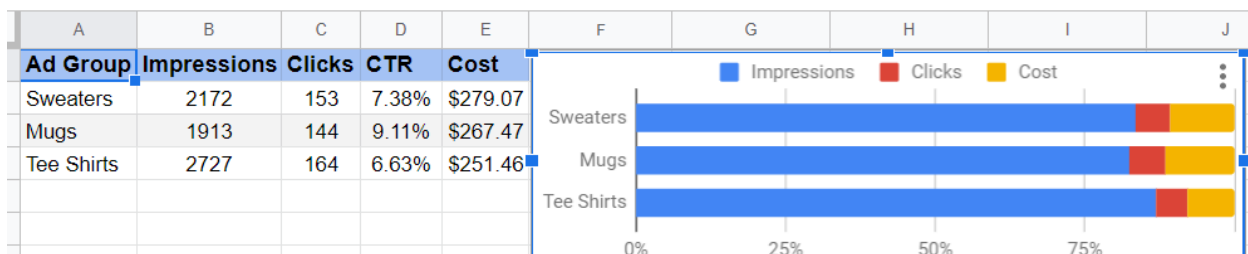
3.2.1 Add the series Cost to the existing chart. Change the chart type from a Column to a Bar chart.



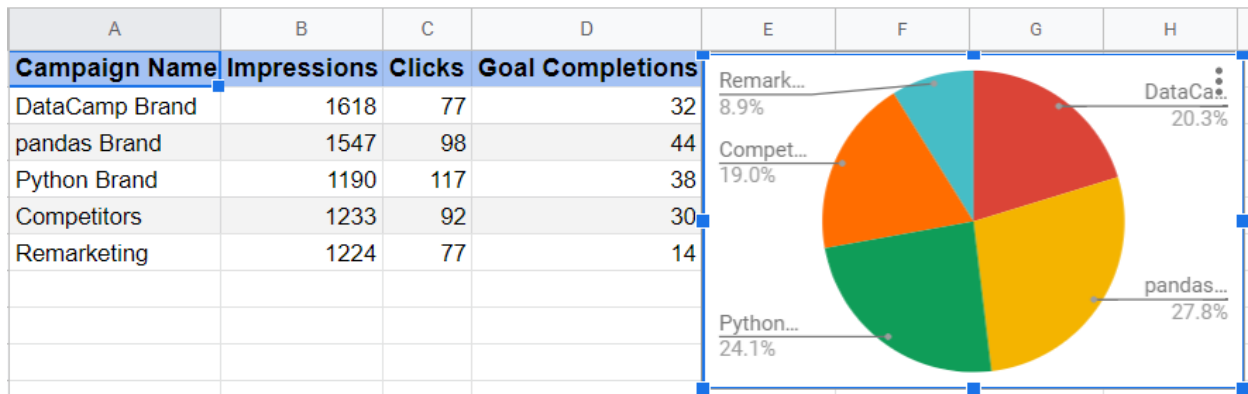
3.2.2 Add Clicks as a series to the bar chart. Switch the chart from a bar chart to a stacked column chart.



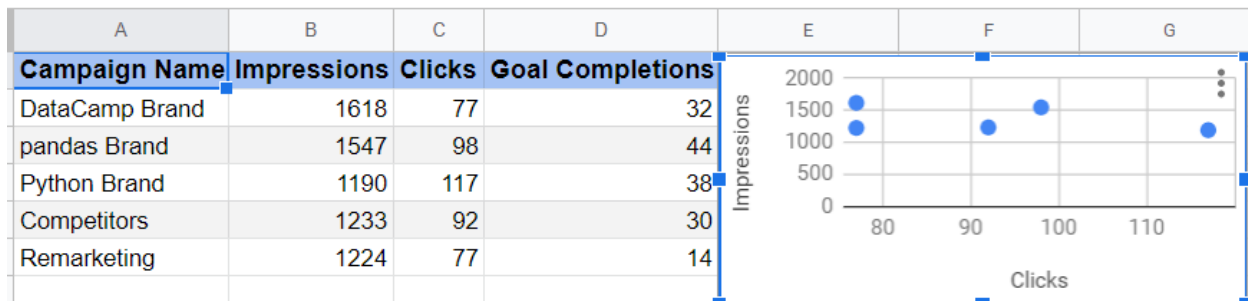
3.2.3 Add Cost as a series to the bar chart. Modify the stacking to be 100%



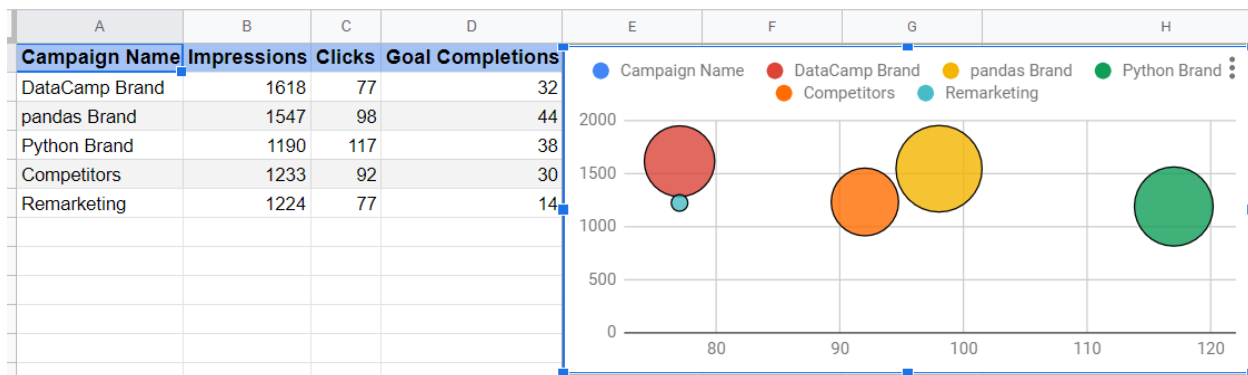
3.3.1 Enter the Goal Completions column as a series to the chart. Modify the chart type to be a pie chart.



3.3.2 Swap out the series Clicks with Impressions. Change the chart type to Scatter.

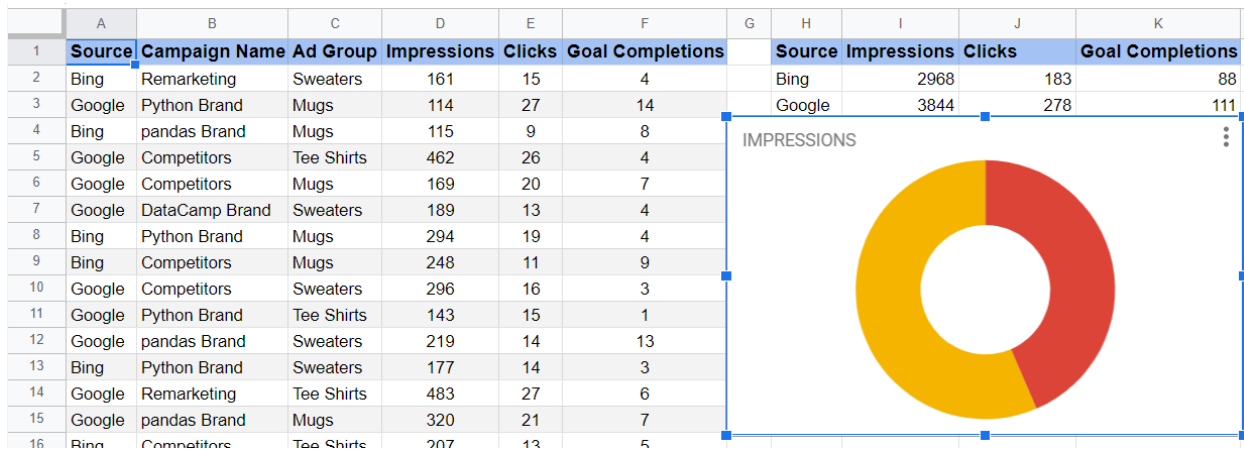


3.3.3 Convert the chart to a bubble chart. Add Campaign Name as a series in the chart editor. Use the column Goal Completions as the bubble size.

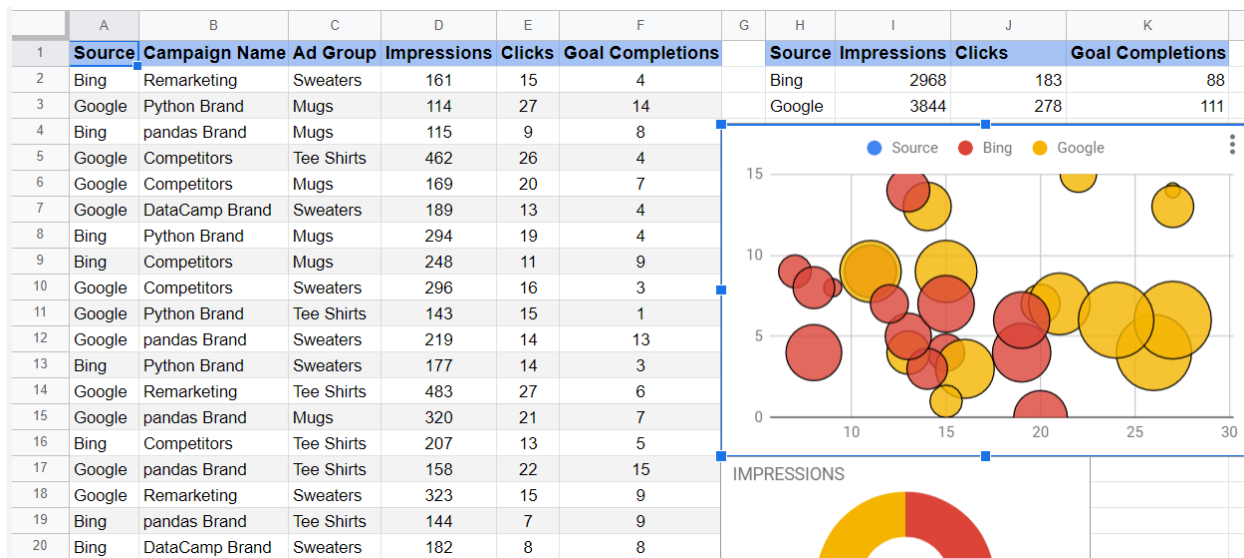




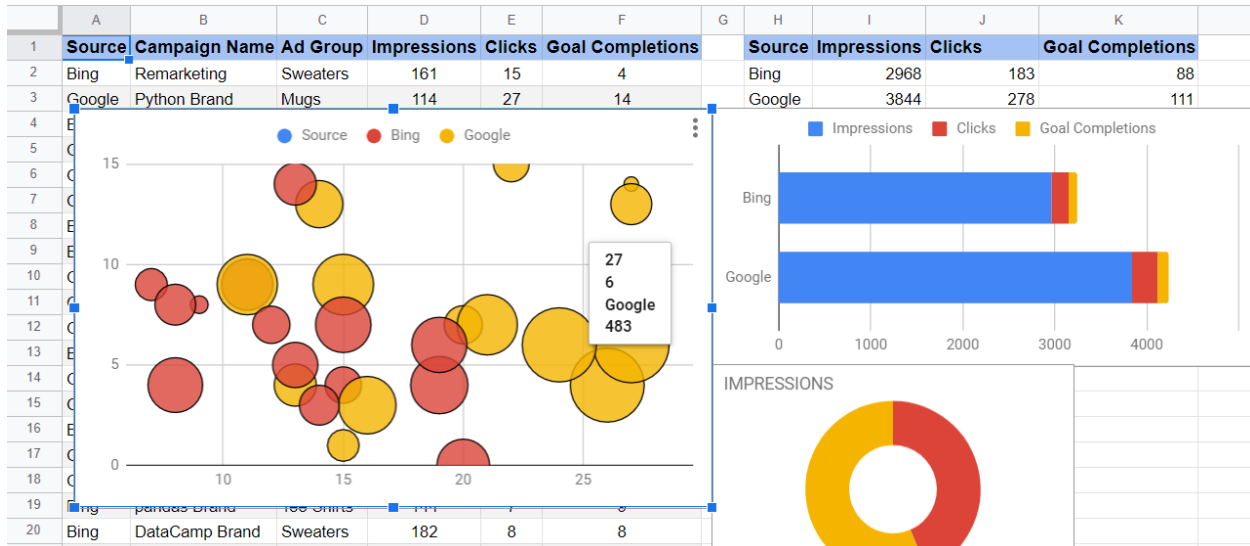
3.4.1 Using the aggregate table, add Impressions to the pie chart as a series. Change the chart type from a pie chart to a doughnut chart.



3.4.2 Modify the scatter chart by changing it into a bubble chart. Using the table located in the range A1:F29, add Source to distinguish the Google and Bing data points. Using the table located in the range A1:F29, add Impressions to determine the size of each bubble.



3.4.3 Using the table located in the range H1:K3, add the series Goal Completions as a series to the existing bar chart. Modify the stacking type to be Standard.



4.1.1 Replace item 1 with Bing and item 2 with Google in the data validation List of items in cell H2 and select Google. Modify the List from a range data validation range in cell H3 to include all campaign names.

Google								
A	B	C	D	E	F	G	H	I
Source	Campaign Name	Ad Group	Impressions	Clicks	Cost			
Bing	Remarketing	Sweater Buyers	161	15	\$46.91		Google	
Google	Python Brand	Mug Buyers	114	27	\$45.70		Bing	
Bing	pandas Brand	Mug Buyers	115	9	\$43.77		Google	
Google	Competitors	Tee Shirt Buyers	462	26	\$43.39			
A	B	C	D	E	F	G	H	I
Source	Campaign Name	Ad Group	Impressions	Clicks	Cost			
Bing	Remarketing	Sweater Buyers	161	15	\$46.91		Google	
Google	Python Brand	Mug Buyers	114	27	\$45.70			
Bing	pandas Brand	Mug Buyers	115	9	\$43.77		Remarketing	
Google	Competitors	Tee Shirt Buyers	462	26	\$43.39		Python Brand	
Google	Competitors	Mug Buyers	169	20	\$42.23		pandas Brand	
Google	DataCamp Brand	Sweater Buyers	189	13	\$39.68		Competitors	
Bing	Python Brand	Mug Buyers	294	19	\$39.06		DataCamp Brand	
Bing	Competitors	Mug Buyers	248	11	\$38.93			

#### 4.1.2 Write a IF formula to filter the A column which has Google in them.

fx | =IF(LEN(H2) > 1, FILTER(A1:F29, REGEXMATCH(A1:A29, H2)), A2:F29)

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Source	Campaign Name	Ad Group	Impressions	Clicks	Cost							
2	Bing	Remarketing	Sweater Buyers	161	15	\$46.91		Google					
3	Google	Python Brand	Mug Buyers	114	27	\$45.70							
4	Bing	pandas Brand	Mug Buyers	115	9	\$43.77							
5	Google	Competitors	Tee Shirt Buyers	462	26	\$43.39							
6	Google	Competitors	Mug Buyers	169	20	\$42.23							
7	Google	DataCamp Brand	Sweater Buyers	189	13	\$39.68							
8	Bing	Python Brand	Mug Buyers	294	19	\$39.06							
9	Bing	Competitors	Mug Buyers	248	11	\$38.93							
10	Google	Competitors	Sweater Buyers	296	16	\$36.59							
11	Google	Python Brand	Tee Shirt Buyers	143	15	\$35.55							
12	Google	pandas Brand	Sweater Buyers	219	14	\$32.53							
13	Bing	Python Brand	Sweater Buyers	177	14	\$31.89							
14	Google	Remarketing	Tee Shirt Buyers	483	27	\$30.76							
15	Google	pandas Brand	Mug Buyers	320	21	\$29.92							
16	Bing	Competitors	Tee Shirt Buyers	207	13	\$29.45							
17	Google	pandas Brand	Tee Shirt Buyers	158	22	\$29.19							
18	Google	Remarketing	Sweater Buyers	323	15	\$24.75	Source	Campaign Name	Ad Group	Impressions	Clicks	Cost	
19	Bing	pandas Brand	Tee Shirt Buyers	144	7	\$24.04	Google	Python Brand	Mug Buyers	114	27	\$45.70	
20	Bing	DataCamp Brand	Sweater Buyers	182	8	\$23.04	Google	Competitors	Tee Shirt Buyers	462	26	\$43.39	

#### 4.1.3 Select Bing in H2, calculate total impressions with filter K2 to K4 respectively. Then select Google from the drop down box and see the changes.

fx | =SUM(FILTER(\$K\$18:\$K\$32, REGEXMATCH(\$J\$18:\$J\$32, L2)))

	C	D	E	F	G	H	I	J	K	L	M	N
1	Ad Group	Impressions	Clicks	Cost					Ad Group	Regex	Impressions	Clicks
2	Sweater Buyers	161	15	\$46.91		Bing			Sweater Buyers	Sweater.*	962	
3	Mug Buyers	114	27	\$45.70					Mug Buyers	Mug.*	846	
4	Mug Buyers	115	9	\$43.77					Tee Shirt Buyers	Tee.*	1160	
5	Tee Shirt Buyers	462	26	\$43.39								
6	Mug Buyers	169	20	\$42.23								
7	Sweater Buyers	189	13	\$39.68								
8	Mug Buyers	294	19	\$39.06								
9	Mug Buyers	248	11	\$38.93								
10	Sweater Buyers	296	16	\$36.59								
11	Tee Shirt Buyers	143	15	\$35.55								
12	Sweater Buyers	219	14	\$32.53								
13	Sweater Buyers	177	14	\$31.89								
14	Tee Shirt Buyers	483	27	\$30.76								
15	Mug Buyers	320	21	\$29.92								
16	Tee Shirt Buyers	207	13	\$29.45								
17	Tee Shirt Buyers	158	22	\$29.19								
18	Sweater Buyers	323	15	\$24.75	Source	Campaign Name	Ad Group	Impressions	Clicks	Cost		
19	Tee Shirt Buyers	144	7	\$24.04	Bing	Remarketing	Sweater Buyers	161	15	\$46.91		
20	Sweater Buyers	182	8	\$23.04	Bing	pandas Brand	Mug Buyers	115	9	\$43.77		

=SUM(FILTER(\$K\$18:\$K\$32, REGEXMATCH(\$J\$18:\$J\$32, L2)))												
	C	D	E	F	G	H	I	J	K	L	M	N
1	Ad Group	Impressions	Clicks	Cost					Ad Group	Regex	Impressions	Clicks
2	Sweater Buyers	161	15	\$46.91		Google			Sweater Buyers	Sweater.*	1210	
3	Mug Buyers	114	27	\$45.70					Mug Buyers	Mug.*	1067	
4	Mug Buyers	115	9	\$43.77					Tee Shirt Buyers	Tee.*	1567	
5	Tee Shirt Buyers	462	26	\$43.39								
6	Mug Buyers	169	20	\$42.23								
7	Sweater Buyers	189	13	\$39.68								
8	Mug Buyers	294	19	\$39.06								
9	Mug Buyers	248	11	\$38.93								
10	Sweater Buyers	296	16	\$36.59								
11	Tee Shirt Buyers	143	15	\$35.55								
12	Sweater Buyers	219	14	\$32.53								
13	Sweater Buyers	177	14	\$31.89								
14	Tee Shirt Buyers	483	27	\$30.76								
15	Mug Buyers	320	21	\$29.92								
16	Tee Shirt Buyers	207	13	\$29.45								
17	Tee Shirt Buyers	158	22	\$29.19								
18	Sweater Buyers	323	15	\$24.75		Source	Campaign Name	Ad Group	Impressions	Clicks	Cost	
19	Tee Shirt Buyers	144	7	\$24.04		Google	Python Brand	Mug Buyers	114	27	\$45.70	
20	Sweater Buyers	182	8	\$23.04		Google	Competitors	Tee Shirt Buyers	462	26	\$43.39	

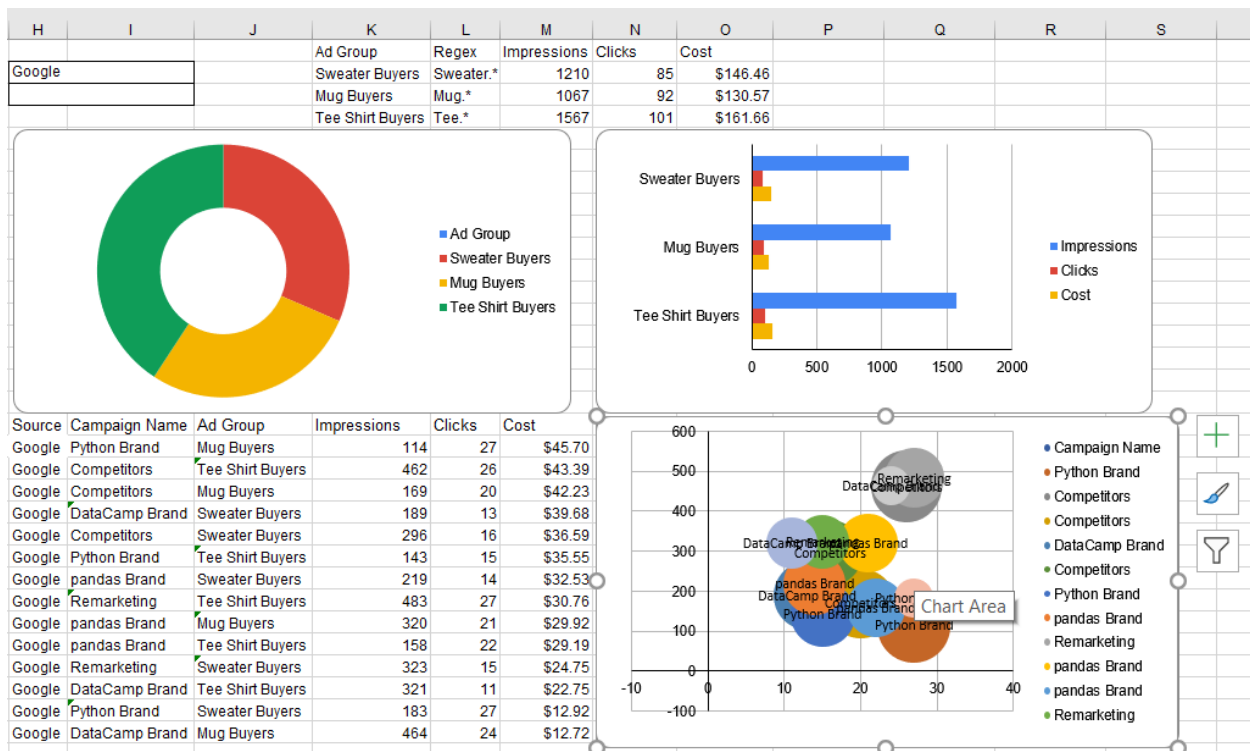
## 4.2 Add three charts respectively in a dashboard:

Add a donut chart of impressions from the aggregate table;

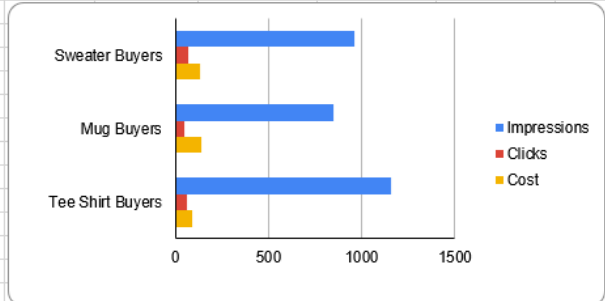
Add a column chart with impression, clicks and cost from aggregation table;

Add a bubble chart with filtered source table, Campaign Name column from the filtered table as the IDs for the points, cost as the sizes of the points.

Change the drop-down box from Google to Bin and see the charts.



H	I	J	K	L	M	N	O	P	Q	R	S
			Ad Group	Regex	Impressions	Clicks	Cost				
Bing			Sweater Buyers	Sweater.*	962	68	\$132.61				
			Mug Buyers	Mug.*	846	52	\$136.91				
			Tee Shirt Buyers	Tee.*	1160	63	\$89.81				



Source	Campaign Name	Ad Group	Impressions	Clicks	Cost
Bing	Remarketing	Sweater Buyers	161	15	\$46.91
Bing	pandas Brand	Mug Buyers	115	9	\$43.77
Bing	Python Brand	Mug Buyers	294	19	\$39.06
Bing	Competitors	Mug Buyers	248	11	\$38.93
Bing	Python Brand	Sweater Buyers	177	14	\$31.89
Bing	Competitors	Tee Shirt Buyers	207	13	\$29.45
Bing	pandas Brand	Tee Shirt Buyers	144	7	\$24.04
Bing	DataCamp Brand	Sweater Buyers	182	8	\$23.04
Bing	pandas Brand	Sweater Buyers	277	19	\$17.80
Bing	DataCamp Brand	Mug Buyers	189	13	\$15.15
Bing	Remarketing	Tee Shirt Buyers	257	20	\$13.07
Bing	Competitors	Sweater Buyers	165	12	\$12.97
Bing	DataCamp Brand	Tee Shirt Buyers	273	8	\$11.74
Bing	Python Brand	Tee Shirt Buyers	279	15	\$11.51

