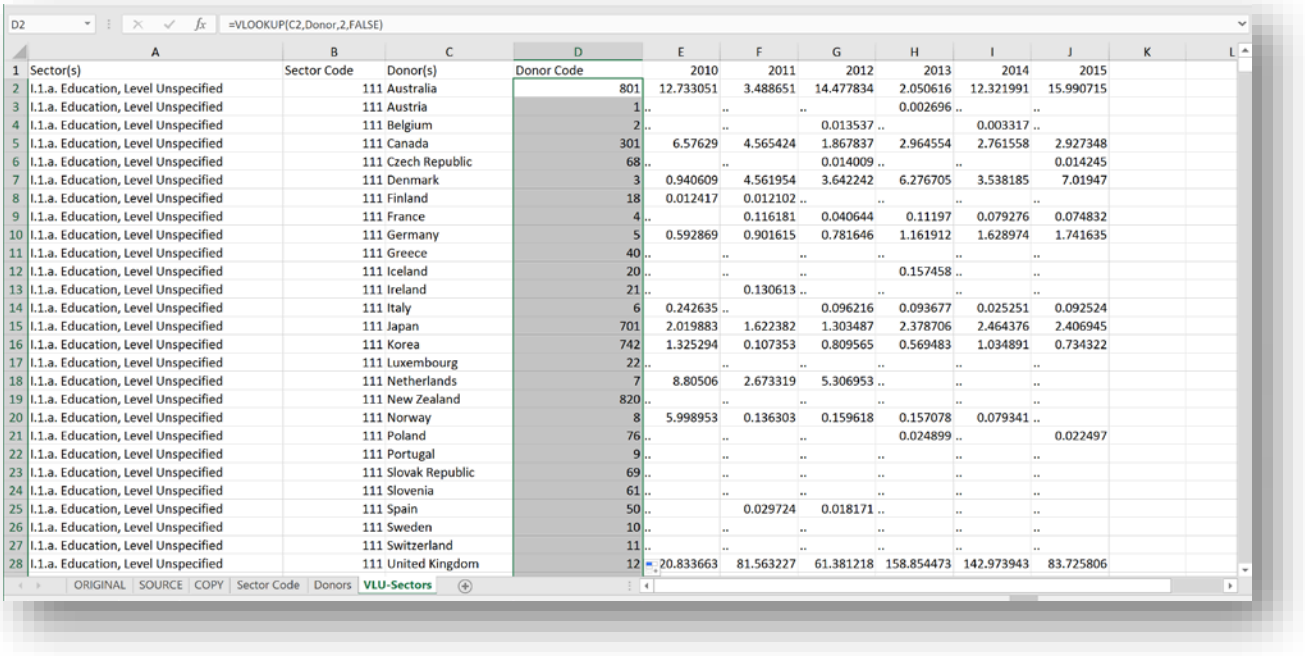
Lab 10: Exploring Data with Pivot Tables

In this lesson, we will learn how to organize large data sets using pivot tables to help us answer questions important to public service delivery stories. In this example, we will examine the conflict of interest surrounding much of the aid to Pakistan. Is it motivated by altruism or by economic interests of donors?

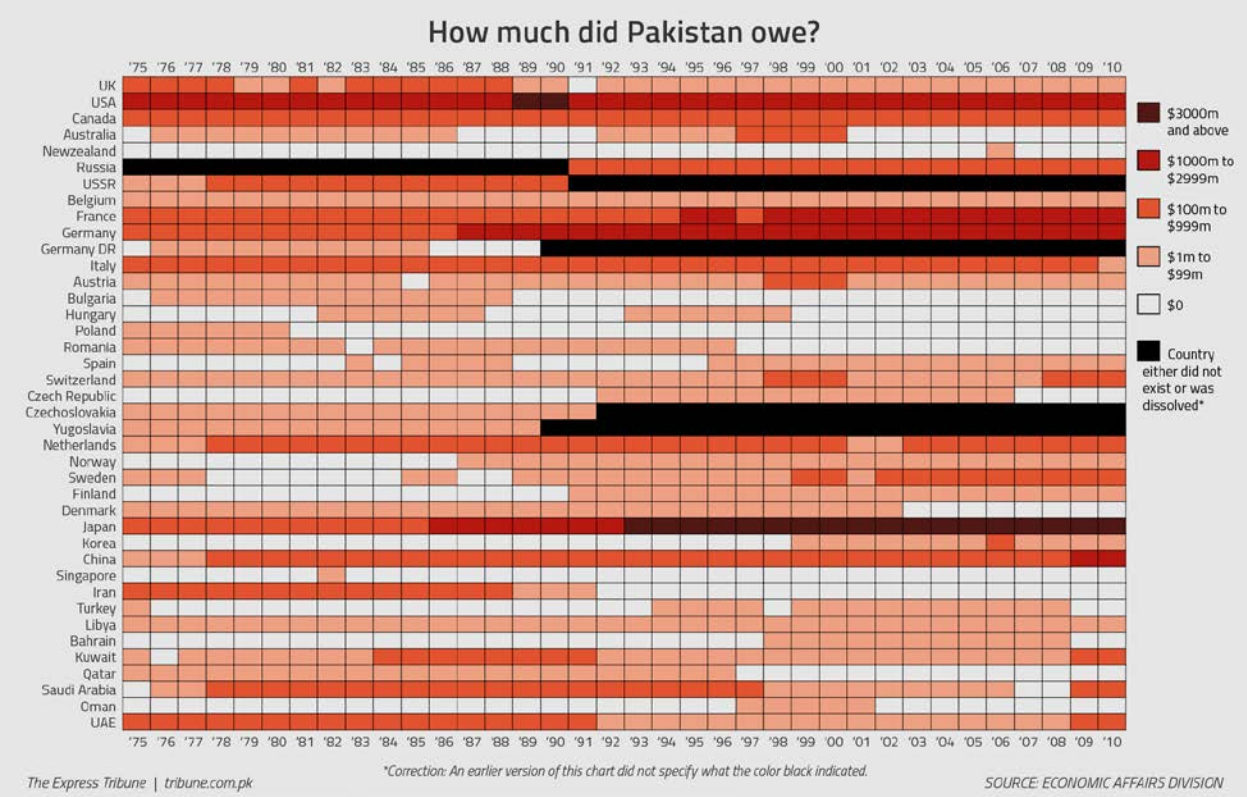


D2 =VLOOKUP(C2,Donor,2,FALSE)

	A	B	C	D	E	F	G	H	I	J
1	Sector(s)	Sector Code	Donor(s)	Donor Code	2010	2011	2012	2013	2014	2015
2	I.1.a. Education, Level Unspecified	111	Australia	801	12.733051	3.488651	14.477834	2.050616	12.321991	15.990715
3	I.1.a. Education, Level Unspecified	111	Austria	1	..	..	..	0.002696	..	..
4	I.1.a. Education, Level Unspecified	111	Belgium	2	..	..	0.013537	..	0.003317	..
5	I.1.a. Education, Level Unspecified	111	Canada	301	6.57629	4.565424	1.867837	2.964554	2.761558	2.927348
6	I.1.a. Education, Level Unspecified	111	Czech Republic	68	..	..	0.014009	..	..	0.014245
7	I.1.a. Education, Level Unspecified	111	Denmark	3	0.940609	4.561954	3.642242	6.276705	3.538185	7.01947
8	I.1.a. Education, Level Unspecified	111	Finland	18	0.012417	0.012102	..	..	..	..
9	I.1.a. Education, Level Unspecified	111	France	4	..	0.116181	0.040644	0.11197	0.079276	0.074832
10	I.1.a. Education, Level Unspecified	111	Germany	5	0.592869	0.901615	0.781646	1.161912	1.628974	1.741635
11	I.1.a. Education, Level Unspecified	111	Greece	40	..	..	..	..	..	..
12	I.1.a. Education, Level Unspecified	111	Iceland	20	..	..	..	0.157458	..	..
13	I.1.a. Education, Level Unspecified	111	Ireland	21	..	0.130613	..	..	..	..
14	I.1.a. Education, Level Unspecified	111	Italy	6	0.242635	..	0.096216	0.093677	0.025251	0.092524
15	I.1.a. Education, Level Unspecified	111	Japan	701	2.019883	1.622382	1.303487	2.378706	2.464376	2.406945
16	I.1.a. Education, Level Unspecified	111	Korea	742	1.325294	0.107353	0.809565	0.569483	1.034891	0.734322
17	I.1.a. Education, Level Unspecified	111	Luxembourg	22	..	..	..	..	..	..
18	I.1.a. Education, Level Unspecified	111	Netherlands	7	8.80506	2.673319	5.306953	..	..	..
19	I.1.a. Education, Level Unspecified	111	New Zealand	820	..	..	..	..	..	..
20	I.1.a. Education, Level Unspecified	111	Norway	8	5.998953	0.136303	0.159618	0.157078	0.079341	..
21	I.1.a. Education, Level Unspecified	111	Poland	76	..	..	..	0.024899	..	0.022497
22	I.1.a. Education, Level Unspecified	111	Portugal	9	..	..	..	..	..	..
23	I.1.a. Education, Level Unspecified	111	Slovak Republic	69	..	..	..	..	..	..
24	I.1.a. Education, Level Unspecified	111	Slovenia	61	..	..	..	..	..	..
25	I.1.a. Education, Level Unspecified	111	Spain	50	..	0.029724	0.018171	..	..	..
26	I.1.a. Education, Level Unspecified	111	Sweden	10	..	..	..	..	..	..
27	I.1.a. Education, Level Unspecified	111	Switzerland	11	..	..	..	..	..	..
28	I.1.a. Education, Level Unspecified	111	United Kingdom	12	20.833663	81.563227	61.381218	158.854473	142.973943	83.725806

ORIGINAL | SOURCE | COPY | Sector Code | Donors | VLU-Sectors

Getting Started



In this example, the team from the Express Tribune most likely used several Excel techniques to answer their hypothesis and questions around the topic of Pakistan's foreign debt. Read:
The Express Tribune Explains Foreign Debt

Exercise: Write down the hypothesis and questions for this story.

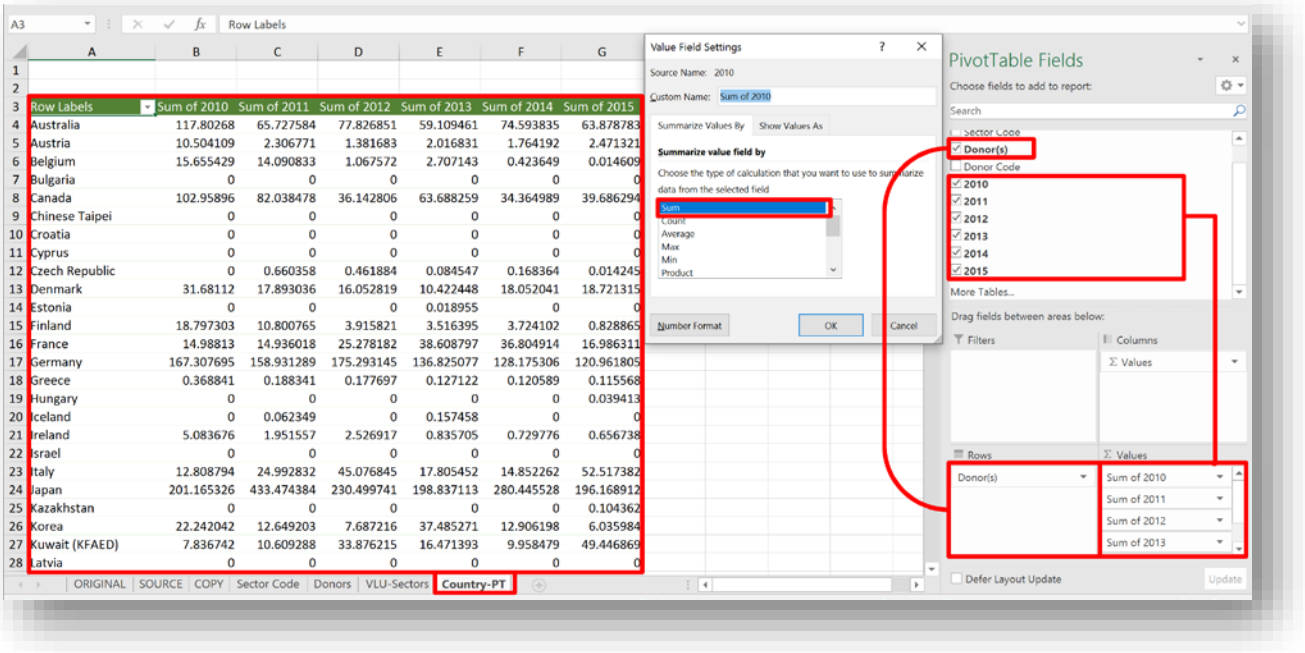
PIVOT TABLES

HYPOTHESIS: Sectors that lay the foundations for economic development (Economic Infrastructure and Services, and Production) receive more money than sectors that promote social development Social Infrastructure & Services) from Pakistan's ten largest donors, which are motivated by their own potential economic gains.

Question 1: Which are the 10 biggest donors to Pakistan? Determine the total of contributions and it percentage by donor.
Question 2: What amount was given to each of these sectors?
Question 3: What percentage does aid to those sectors represent out of the total aid given by those donors?

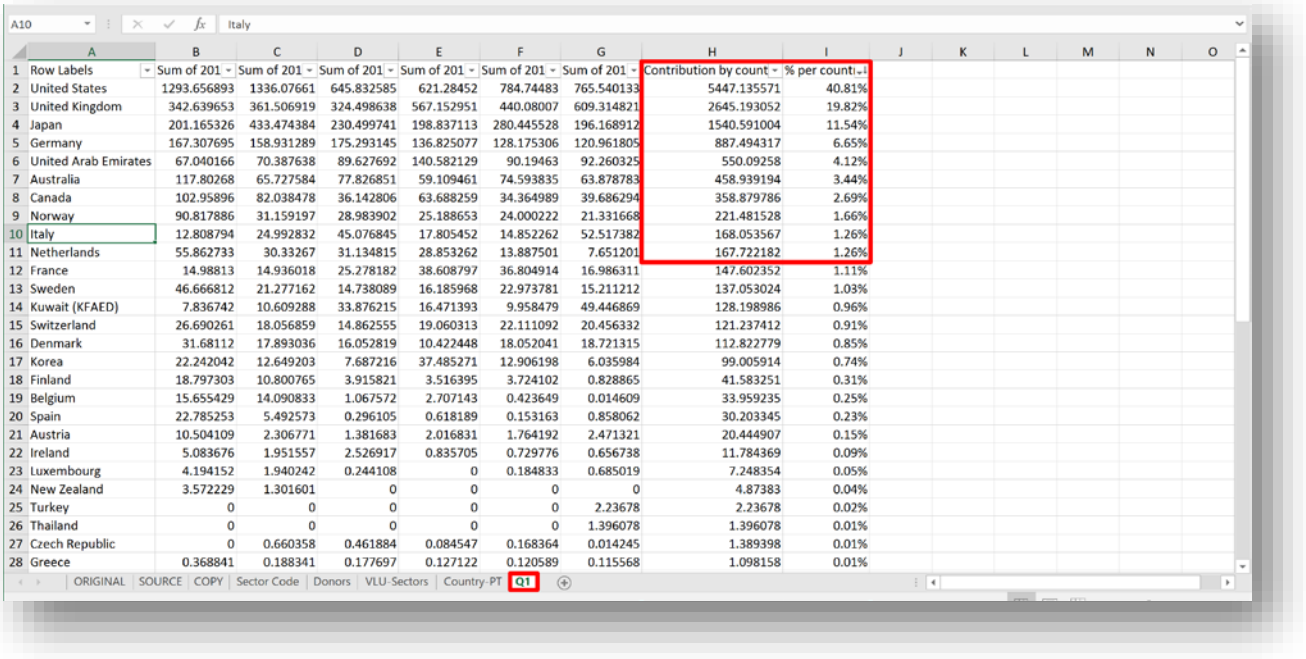
Question 1: Which are the 10 biggest donors to Pakistan? Determine the total of contributions and it percentage by donor.

1. Select all data in the VLU-Sector sheet.
2. Go to Insert – Pivot Tables then click OK in the options. Rename the new sheet as Country-PT
3. In the PivotTable Fields panel drag Donor into the Rows panel and 2010, 2011, 2012, 2013, 2014, and 2015 into the Values Panel.
4. In the Values panel, change to SUM all years



Row Labels	Sum of 2010	Sum of 2011	Sum of 2012	Sum of 2013	Sum of 2014	Sum of 2015
Australia	117.80268	65.727584	77.826851	59.109461	74.593835	63.878783
Austria	10.504109	2.306771	1.381683	2.016831	1.764192	2.471321
Belgium	15.655429	14.090833	1.067572	2.707143	0.423649	0.014609
Bulgaria	0	0	0	0	0	0
Canada	102.95896	82.038478	36.142806	63.688259	34.364989	39.686294
Chinese Taipei	0	0	0	0	0	0
Croatia	0	0	0	0	0	0
Cyprus	0	0	0	0	0	0
Czech Republic	0	0.660358	0.461884	0.084547	0.168364	0.014245
Denmark	31.68112	17.893036	16.052819	10.422448	18.052041	18.721315
Estonia	0	0	0	0.018955	0	0
Finland	18.797303	10.800765	3.915821	3.516395	3.724102	0.828865
France	14.98813	14.936018	25.278182	38.608797	36.804914	16.986311
Germany	167.307695	158.931289	175.293145	136.825077	128.175306	120.961805
Greece	0.368841	0.188341	0.177697	0.127122	0.120589	0.115568
Hungary	0	0	0	0	0	0.039413
Iceland	0	0.062349	0	0.157458	0	0
Ireland	5.083676	1.951557	2.526917	0.835705	0.729776	0.656738
Israel	0	0	0	0	0	0
Italy	12.808794	24.992832	45.076845	17.805452	14.852262	52.517382
Japan	201.165326	433.474384	230.499741	198.837113	280.445528	196.168912
Kazakhstan	0	0	0	0	0	0.104362
Korea	22.242042	12.649203	7.687216	37.485271	12.906198	6.035984
Kuwait (KFAED)	7.836742	10.609288	33.876215	16.471393	9.958479	49.446869
Latvia	0	0	0	0	0	0

5. Make a new sheet and name it as Q1
6. Copy the data in Country-PT sheet and paste in Q1. Remember to paste values.
7. Type *Contribution by Country* in cell H1 as the header.
8. Get the total by country using the SUM function
9. Type in cell I1, *% per Country* as a header
10. Calculate percentage by country
11. Move Grand Total row (row 50) three rows below
12. Using filter tool sort percentage Largest to Smallest

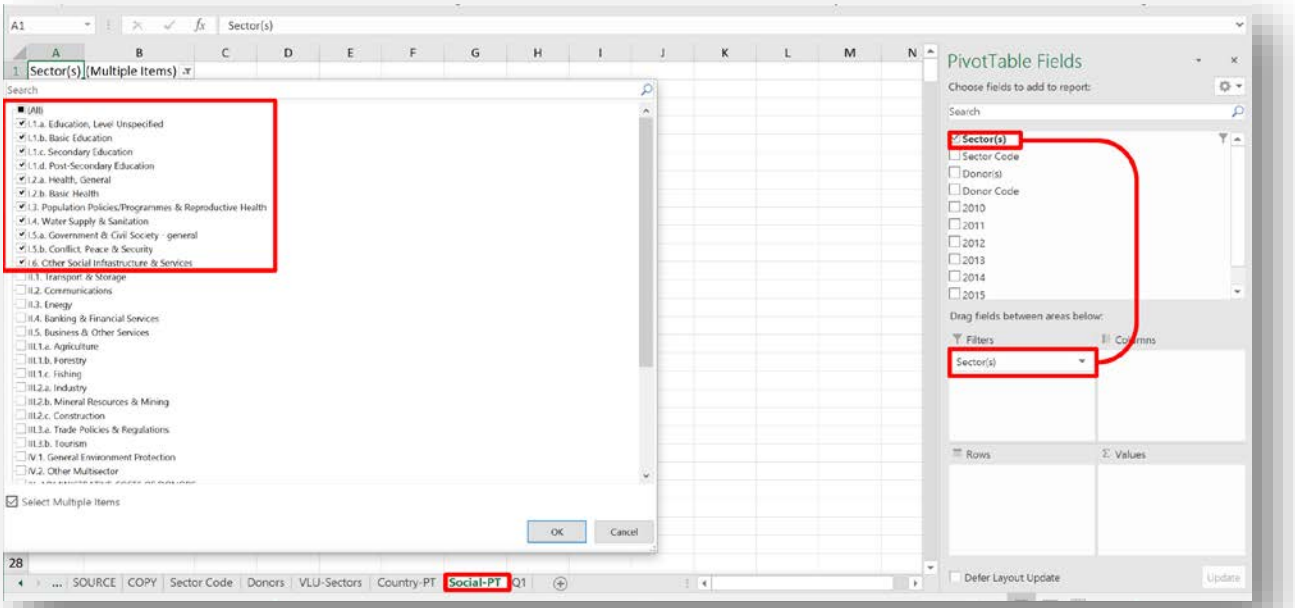


Row Labels	Sum of 201	Sum of 201	Sum of 201	Sum of 201	Sum of 201	Sum of 201	Contribution by count	% per counti
United States	1293.656893	1336.07661	645.832585	621.28452	784.74483	765.540133	5447.135571	40.81%
United Kingdom	342.639653	361.506919	324.498638	567.152951	440.08007	609.314821	2645.193052	19.82%
Japan	201.165326	433.474384	230.499741	198.837113	280.445528	196.168912	1540.591004	11.54%
Germany	167.307695	158.931289	175.293145	136.825077	128.175306	120.961805	887.494317	6.65%
United Arab Emirates	67.040166	70.387638	89.627692	140.582129	90.19463	92.260325	550.09258	4.12%
Australia	117.80268	65.727584	77.826851	59.109461	74.593835	63.878783	458.939194	3.44%
Canada	102.95896	82.038478	36.142806	63.688259	34.364989	39.686294	358.879786	2.69%
Norway	90.817886	31.159197	28.983902	25.188653	24.000222	21.331668	221.481528	1.66%
Italy	12.808794	24.992832	45.076845	17.805452	14.852262	52.517382	168.053567	1.26%
Netherlands	55.862733	30.33267	31.134815	28.853262	13.887501	7.651201	167.722182	1.26%
France	14.98813	14.936018	25.278182	38.608797	36.804914	16.986311	147.602352	1.11%
Sweden	46.666812	21.277162	14.738089	16.185968	22.973781	15.211212	137.053024	1.03%
Kuwait (KFAED)	7.836742	10.609288	33.876215	16.471393	9.958479	49.446869	128.198986	0.96%
Switzerland	26.690261	18.056859	14.862555	19.060313	22.111092	20.456332	121.237412	0.91%
Denmark	31.68112	17.893036	16.052819	10.422448	18.052041	18.721315	112.822779	0.85%
Korea	22.242042	12.649203	7.687216	37.485271	12.906198	6.035984	99.005914	0.74%
Finland	18.797303	10.800765	3.915821	3.516395	3.724102	0.828865	41.583251	0.31%
Belgium	15.655429	14.090833	1.067572	2.707143	0.423649	0.014609	33.959235	0.25%
Spain	22.785253	5.492573	0.296105	0.618189	0.153163	0.858062	30.203345	0.23%
Austria	10.504109	2.306771	1.381683	2.016831	1.764192	2.471321	20.444907	0.15%
Ireland	5.083676	1.951557	2.526917	0.835705	0.729776	0.656738	11.784369	0.09%
Luxembourg	4.194152	1.940242	0.244108	0	0.184833	0.685019	7.248354	0.05%
New Zealand	3.572229	1.301601	0	0	0	0	4.87383	0.04%
Turkey	0	0	0	0	0	2.23678	2.23678	0.02%
Thailand	0	0	0	0	0	1.396078	1.396078	0.01%
Czech Republic	0	0.660358	0.461884	0.084547	0.168364	0.014245	1.389398	0.01%
Greece	0.368841	0.188341	0.177697	0.127122	0.120589	0.115568	1.098158	0.01%

Question 2: What amount was given to each of these sectors?

13. Sectors are kind of messy because they come from a root sector. So we need to use filters on pivot tables to answer the question. Begin by making a PivotTable from VLU-Sector sheet, rename it as Social-PT

14. Drag Sector to Filter Panel. Use the filter to select sectors related with Social Infrastructure and Services (Use sector classification from THE LIST OF CRS PURPOSE CODES).



15. Drag Donor to the Rows panel

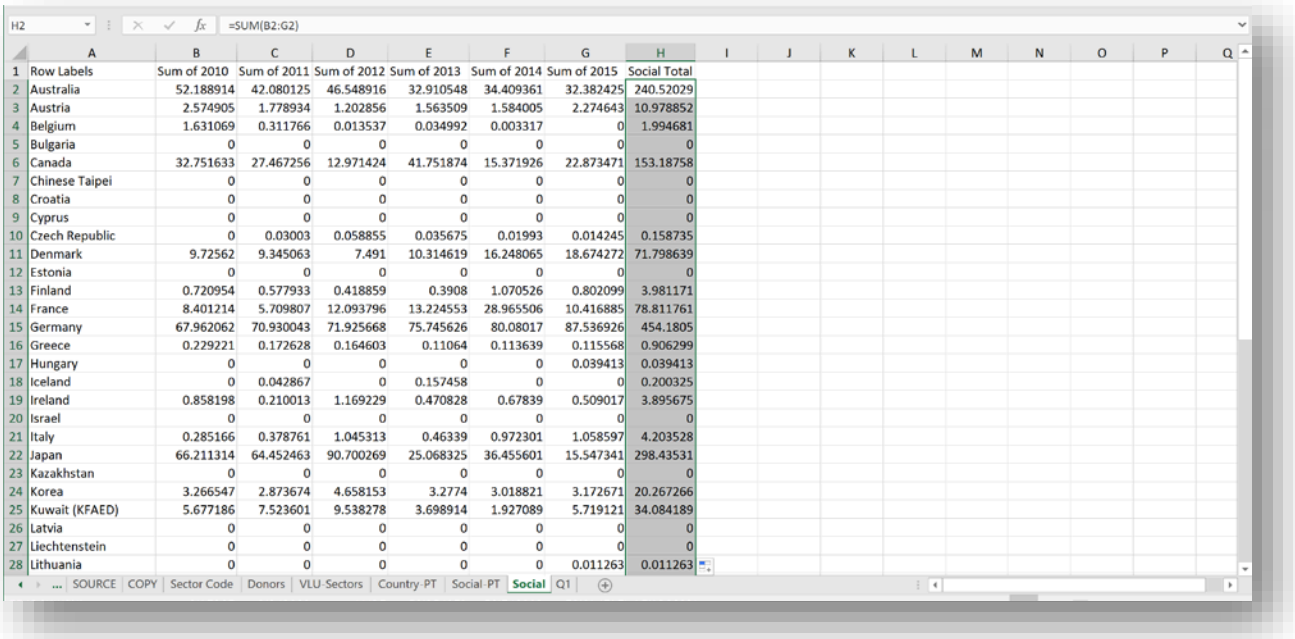
16. Drag 2010, 2011, 2012, 2013, 2014, and 2014 into Values panel, change in Values panel SUM all years

17. Make a new sheet and name it as Social

18. Copy the data in Social-PT sheet and paste in Social, remember copy values

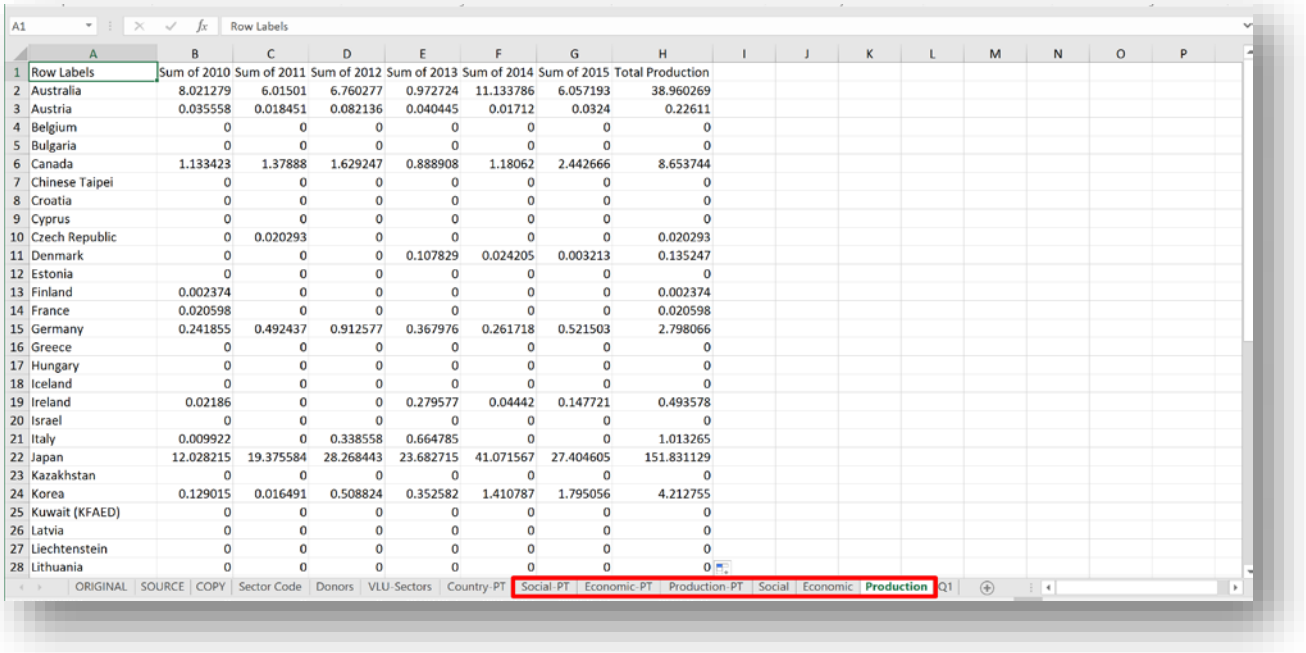
19. Type in H1 *Social Total* as a header

20. Using SUM function get the Total for all years for Social Infrastructure & Services



Row Labels	Sum of 2010	Sum of 2011	Sum of 2012	Sum of 2013	Sum of 2014	Sum of 2015	Social Total
Australia	52.188914	42.080125	46.548916	32.910548	34.409361	32.382425	240.52029
Austria	2.574905	1.778934	1.202856	1.563509	1.584005	2.274643	10.978852
Belgium	1.631069	0.311766	0.013537	0.034992	0.003317	0	1.994681
Bulgaria	0	0	0	0	0	0	0
Canada	32.751633	27.467256	12.971424	41.751874	15.371926	22.873471	153.18758
Chinese Taipei	0	0	0	0	0	0	0
Croatia	0	0	0	0	0	0	0
Cyprus	0	0	0	0	0	0	0
Czech Republic	0	0.03003	0.058855	0.035675	0.01993	0.014245	0.158735
Denmark	9.72562	9.345063	7.491	10.314619	16.248065	18.674272	71.798639
Estonia	0	0	0	0	0	0	0
Finland	0.720954	0.577933	0.418859	0.3908	1.070526	0.802099	3.981171
France	8.401214	5.709807	12.093796	13.224553	28.965506	10.416885	78.811761
Germany	67.962062	70.930043	71.925668	75.745626	80.08017	87.536926	454.1805
Greece	0.229221	0.172628	0.164603	0.11064	0.113639	0.115568	0.906299
Hungary	0	0	0	0	0	0.039413	0.039413
Iceland	0	0.042867	0	0.157458	0	0	0.200325
Ireland	0.858198	0.210013	1.169229	0.470828	0.67839	0.509017	3.895675
Israel	0	0	0	0	0	0	0
Italy	0.285166	0.378761	1.045313	0.46339	0.972301	1.058597	4.203528
Japan	66.211314	64.452463	90.700269	25.068325	36.455601	15.547341	298.43531
Kazakhstan	0	0	0	0	0	0	0
Korea	3.266547	2.873674	4.658153	3.2774	3.018821	3.172671	20.267266
Kuwait (KFAED)	5.677186	7.523601	9.538278	3.698914	1.927089	5.719121	34.084189
Latvia	0	0	0	0	0	0	0
Liechtenstein	0	0	0	0	0	0	0
Lithuania	0	0	0	0	0	0.011263	0.011263

21. Repeat 51 to 58 with Economic Infrastructure and Services, and Production Sectors.

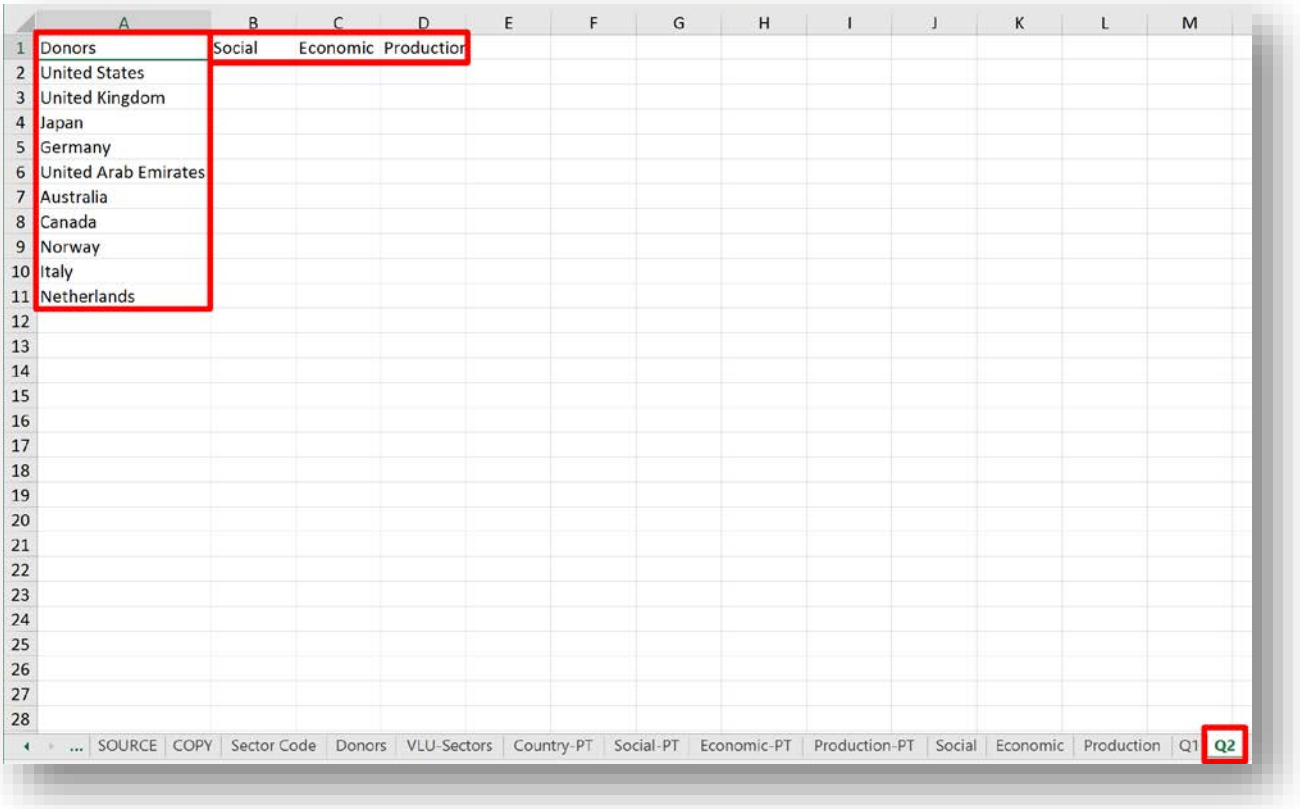


Row Labels	Sum of 2010	Sum of 2011	Sum of 2012	Sum of 2013	Sum of 2014	Sum of 2015	Total Production
Australia	8.021279	6.01501	6.760277	0.972724	11.133786	6.057193	38.960269
Austria	0.035558	0.018451	0.082136	0.040445	0.01712	0.0324	0.22611
Belgium	0	0	0	0	0	0	0
Bulgaria	0	0	0	0	0	0	0
Canada	1.133423	1.37888	1.629247	0.888908	1.18062	2.442666	8.653744
Chinese Taipei	0	0	0	0	0	0	0
Croatia	0	0	0	0	0	0	0
Cyprus	0	0	0	0	0	0	0
Czech Republic	0	0.020293	0	0	0	0	0.020293
Denmark	0	0	0	0.107829	0.024205	0.003213	0.135247
Estonia	0	0	0	0	0	0	0
Finland	0.002374	0	0	0	0	0	0.002374
France	0.020598	0	0	0	0	0	0.020598
Germany	0.241855	0.492437	0.912577	0.367976	0.261718	0.521503	2.798066
Greece	0	0	0	0	0	0	0
Hungary	0	0	0	0	0	0	0
Iceland	0	0	0	0	0	0	0
Ireland	0.02186	0	0	0.279577	0.04442	0.147721	0.493578
Israel	0	0	0	0	0	0	0
Italy	0.009922	0	0.338558	0.664785	0	0	1.013265
Japan	12.028215	19.375584	28.268443	23.682715	41.071567	27.404605	151.831129
Kazakhstan	0	0	0	0	0	0	0
Korea	0.129015	0.016491	0.508824	0.352582	1.410787	1.795056	4.212755
Kuwait (KFAED)	0	0	0	0	0	0	0
Latvia	0	0	0	0	0	0	0
Liechtenstein	0	0	0	0	0	0	0
Lithuania	0	0	0	0	0	0	0

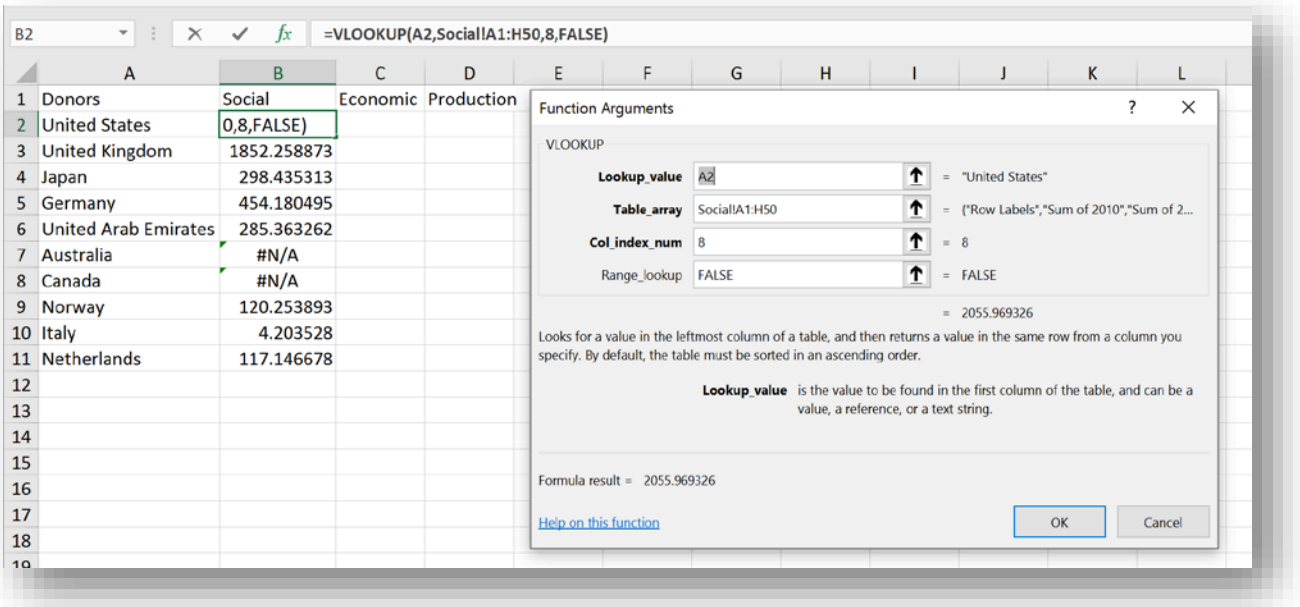
22. Make a New Sheet and rename as Q2

23. From Q1 copy the list of top 10 donors to Pakistan (United States, United Kingdom, Japan, Germany, United Arab Emirates, Australia, Canada, Norway, Italy, Netherlands). Do not forget the header *Donors*.

24. Make headers for columns B, C, D as *Social, Economic,* and *Production* respectively.



25. So now we have a list of Donors in Q2 and 3 in different sheets with the information about those donors. You can't use copy paste because of errors. Use VLOOKUP to LOOK for the Donors in in social, Economic, and Production sheet and fill the amounts in Q2 in the respectively column.

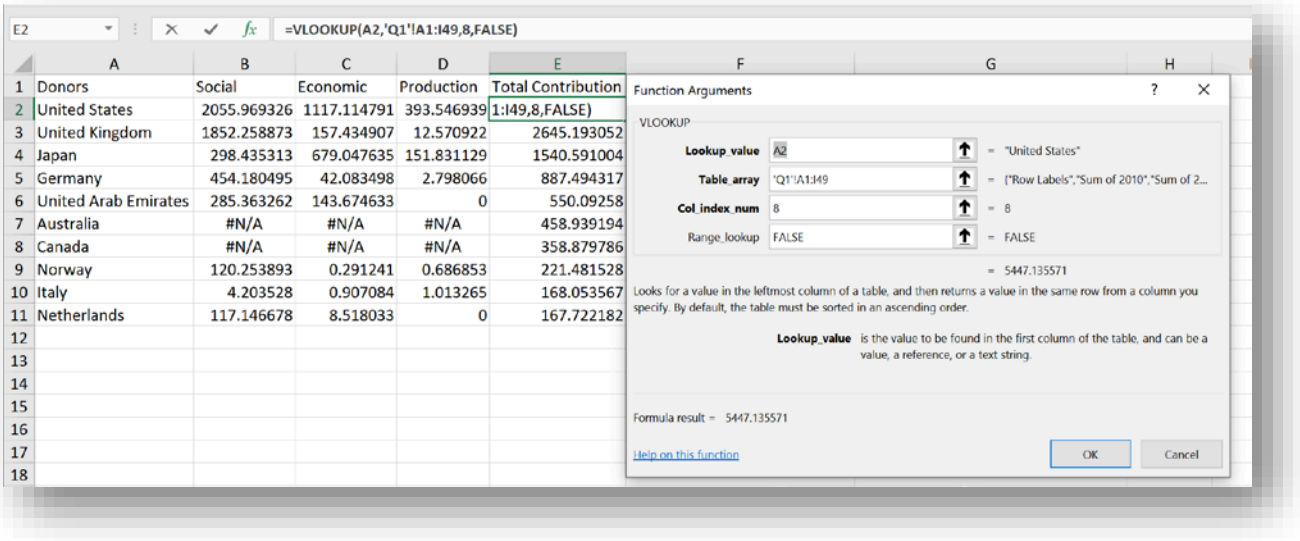


Question 3: What percentage does aid to those sectors represent out of the total aid given by those donors?

26. Make a New Sheet and rename it as Q3

27. Copy the data in Q2 sheet and paste values in Q3 sheet

28. Using VLOOKUP function bring the contribution for the 10 biggest donors to Pakistan from the information in Q1 sheet. From the list of donors in Q3 sheet, LOOK for them in Q1 sheet to retrieve the Contribution by Donor



	A	B	C	D	E
1	Donors	Social	Economic	Production	Total Contribution
2	United States	2055.969326	1117.114791	393.546939	1:I49,8,FALSE)
3	United Kingdom	1852.258873	157.434907	12.570922	2645.193052
4	Japan	298.435313	679.047635	151.831129	1540.591004
5	Germany	454.180495	42.083498	2.798066	887.494317
6	United Arab Emirates	285.363262	143.674633	0	550.09258
7	Australia	#N/A	#N/A	#N/A	458.939194
8	Canada	#N/A	#N/A	#N/A	358.879786
9	Norway	120.253893	0.291241	0.686853	221.481528
10	Italy	4.203528	0.907084	1.013265	168.053567
11	Netherlands	117.146678	8.518033	0	167.722182

29. Calculate the percentage for each sector given for each donor in total

	A	B	C	D	E	F	G	H
1	Donors	Social	Economic	Production	Total Contribution	Social Infrastructure & Services	Economic Infrastructure and Services	Production
2	United States	2055.969326	1117.114791	393.546939	5447.135571	37.74%	20.51%	7.22%
3	United Kingdom	1852.258873	157.434907	12.570922	2645.193052	70.02%	5.95%	0.48%
4	Japan	298.435313	679.047635	151.831129	1540.591004	19.37%	44.08%	9.86%
5	Germany	454.180495	42.083498	2.798066	887.494317	51.18%	4.74%	0.32%
6	United Arab Emirates	285.363262	143.674633	0	550.09258	51.88%	26.12%	0.00%
7	Australia	#N/A	#N/A	#N/A	458.939194	#N/A	#N/A	#N/A
8	Canada	#N/A	#N/A	#N/A	358.879786	#N/A	#N/A	#N/A
9	Norway	120.253893	0.291241	0.686853	221.481528	54.30%	0.13%	0.31%
10	Italy	4.203528	0.907084	1.013265	168.053567	2.50%	0.54%	0.60%
11	Netherlands	117.146678	8.518033	0	167.722182	69.85%	5.08%	0.00%

Conclusions:

The ten biggest donors to Pakistan are mostly contributing to Social Infrastructure & Services with the exception of Japan.

Japan have more than double the contribution to Economic Infrastructure and Services than Social Infrastructure & Services

The United Stated and United Arab Emirates have around half of their respective contributions dedicated to Economic Infrastructure and Services and the other half to Social Infrastructure & Services

Exercise

Write another Hypothesis and Questions (at list 3 questions) from the data provide or from Query Wizard for International Development Statistics.