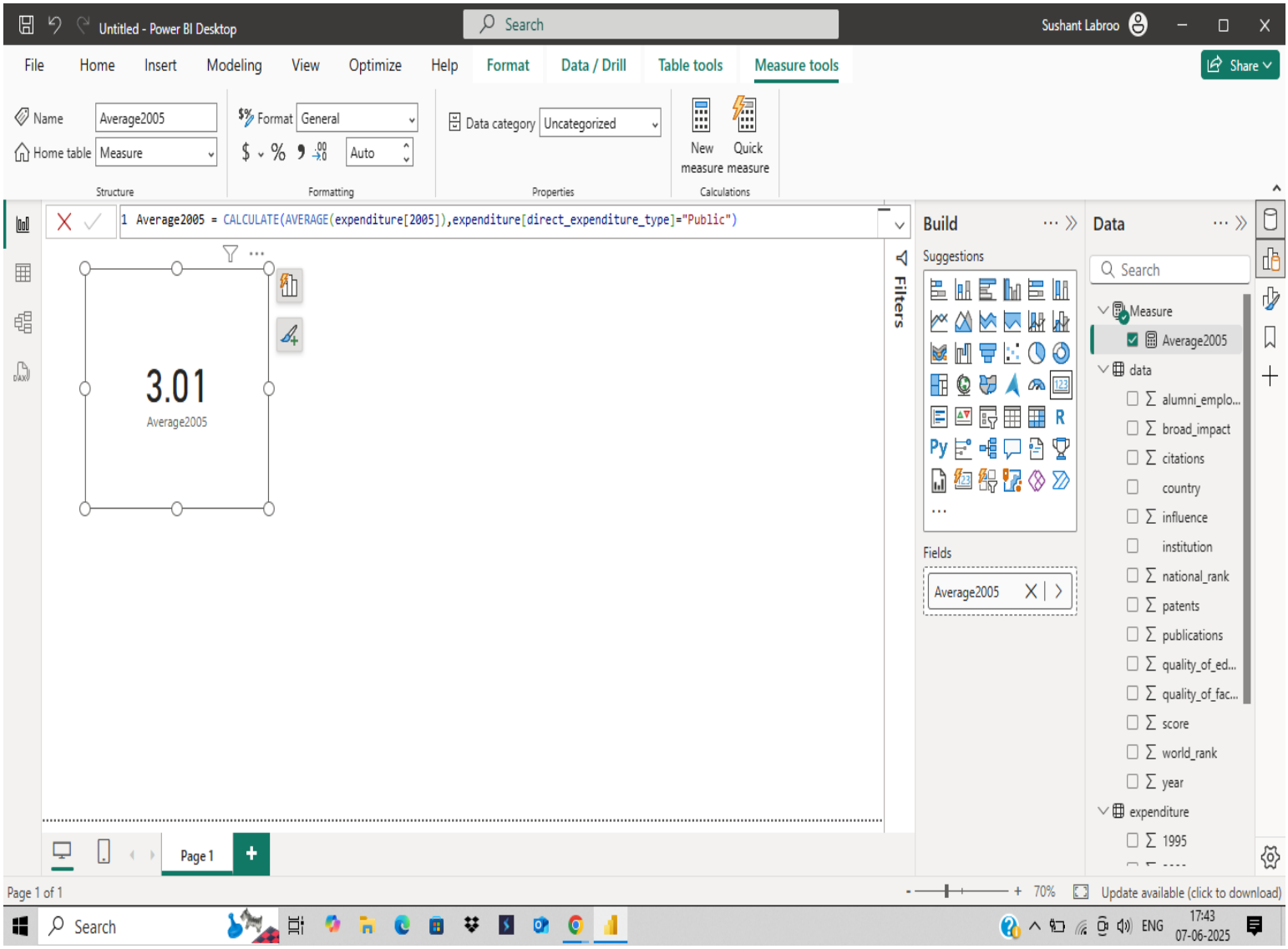
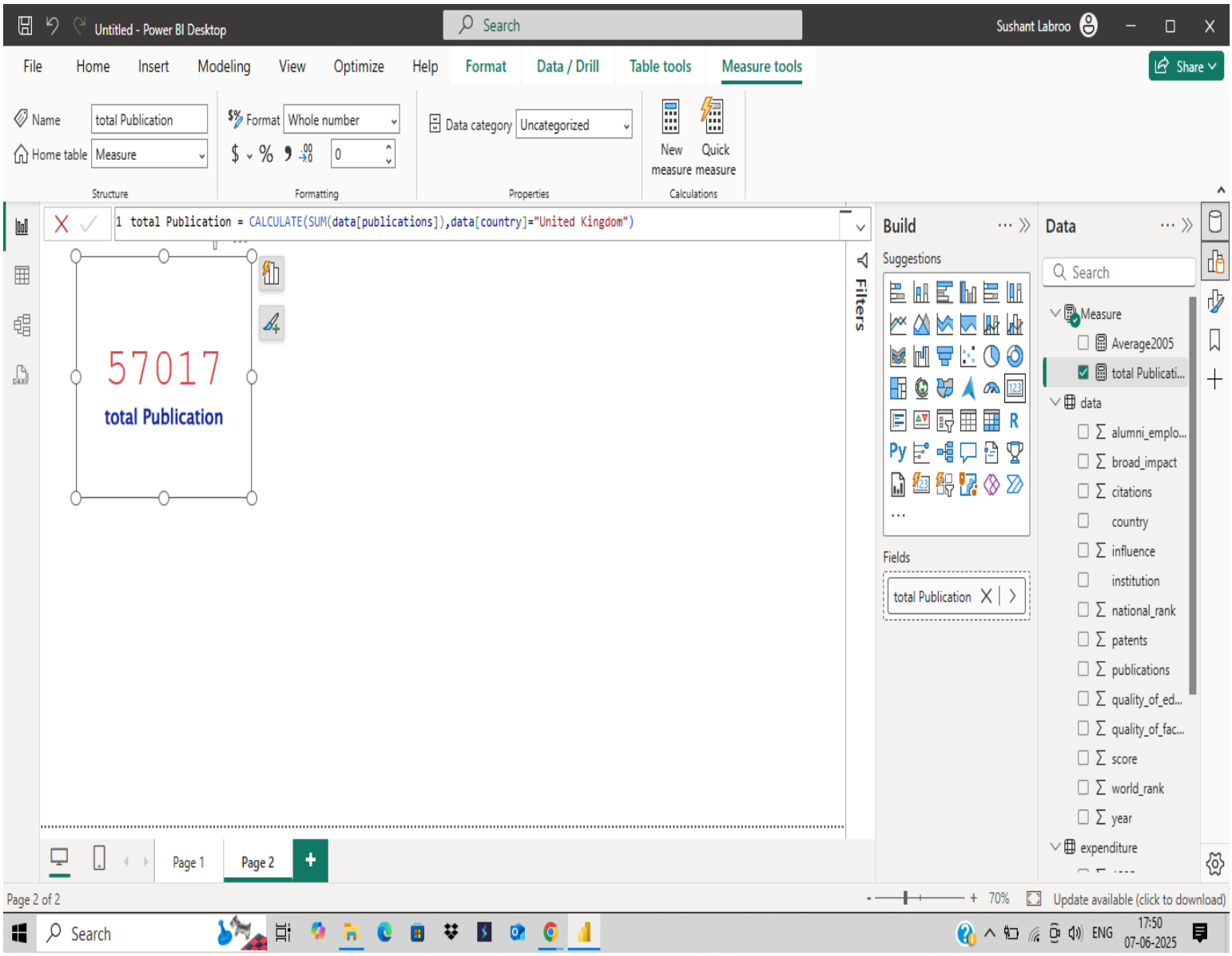
Task 1: Calculate the average public expenditure for the year 2005 across all countries.



To Perform this task:

- First we created a measure named **Average2005**
- DAX formula
  Average2005 =
  CALCULATE(AVERAGE(expenditure[2005]),expenditure[direct_expenditure_type]=”Public”)
- Then selected a card visual to show the output.

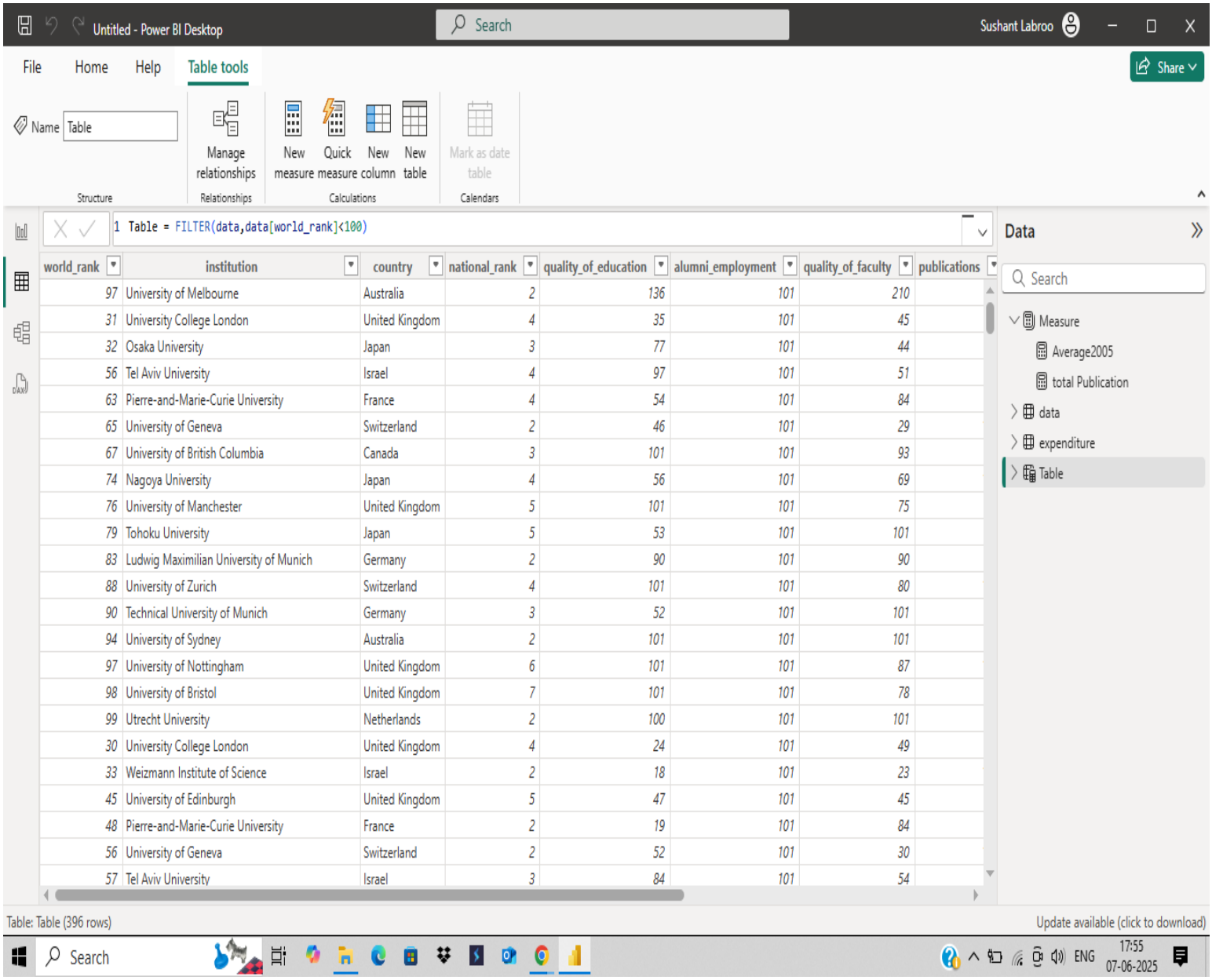
Task 2: Calculate the total publications for institutions in the UK.



To perform this task:

- Create a new measure named **total Publication**
- DAX Formula
  total Publications =CALCULATE(SUM(data[publications]),data[country]=”United Kingdom”)
- Then select a card visual to show the output.

Task 3: Filter the dataset to show only institutions with a world rank below 100.

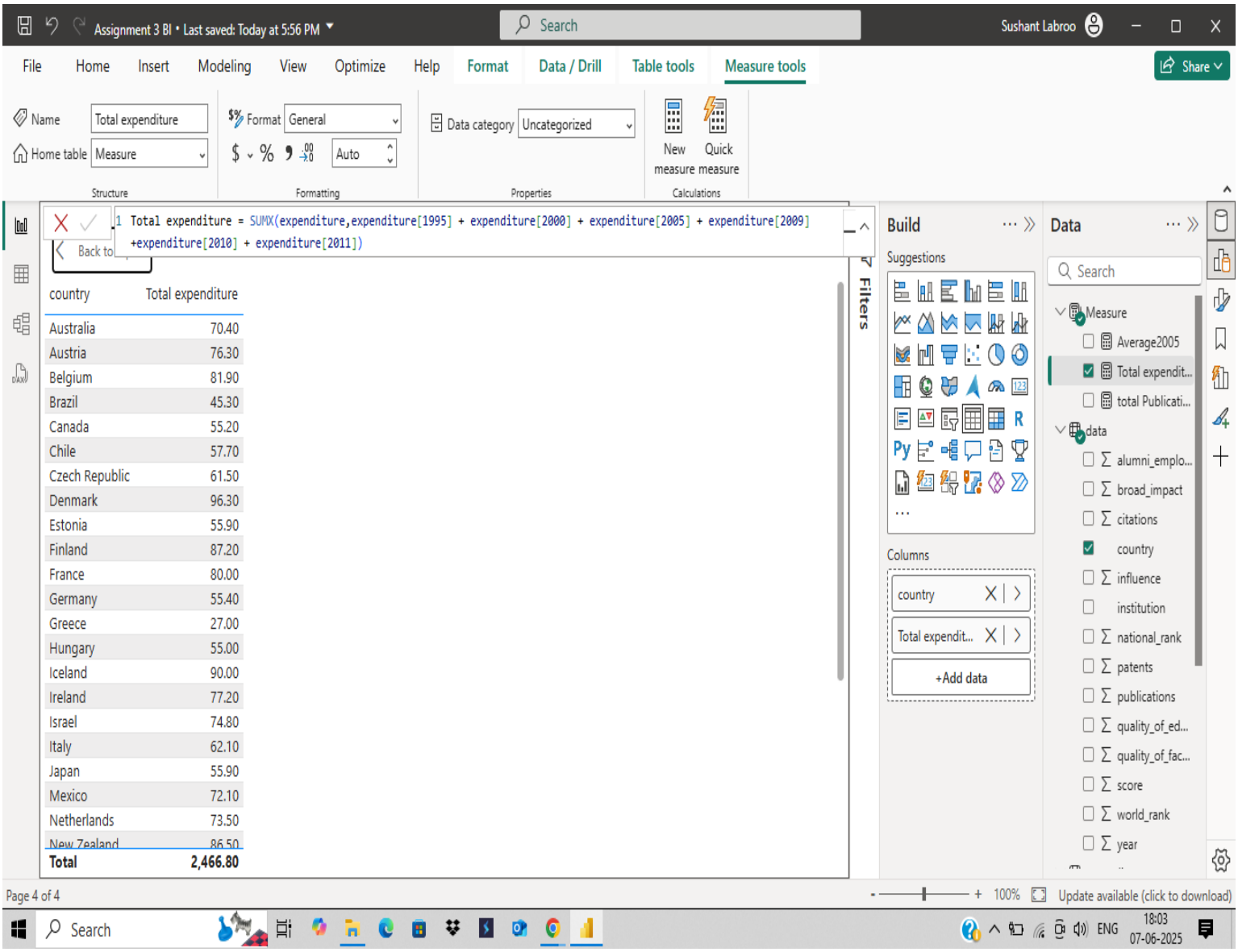


world_rank	institution	country	national_rank	quality_of_education	alumni_employment	quality_of_faculty	publications
97	University of Melbourne	Australia	2	136	101	210	
31	University College London	United Kingdom	4	35	101	45	
32	Osaka University	Japan	3	77	101	44	
56	Tel Aviv University	Israel	4	97	101	51	
63	Pierre-and-Marie-Curie University	France	4	54	101	84	
65	University of Geneva	Switzerland	2	46	101	29	
67	University of British Columbia	Canada	3	101	101	93	
74	Nagoya University	Japan	4	56	101	69	
76	University of Manchester	United Kingdom	5	101	101	75	
79	Tohoku University	Japan	5	53	101	101	
83	Ludwig Maximilian University of Munich	Germany	2	90	101	90	
88	University of Zurich	Switzerland	4	101	101	80	
90	Technical University of Munich	Germany	3	52	101	101	
94	University of Sydney	Australia	2	101	101	101	
97	University of Nottingham	United Kingdom	6	101	101	87	
98	University of Bristol	United Kingdom	7	101	101	78	
99	Utrecht University	Netherlands	2	100	101	101	
30	University College London	United Kingdom	4	24	101	49	
33	Weizmann Institute of Science	Israel	2	18	101	23	
45	University of Edinburgh	United Kingdom	5	47	101	45	
48	Pierre-and-Marie-Curie University	France	2	19	101	84	
56	University of Geneva	Switzerland	2	52	101	30	
57	Tel Aviv University	Israel	3	84	101	54	

To Perform this task:

- Go to table view > Select the data table > Table tools > New table
- Then DAX Formula **Table = FILTER(data,data[world_rank]<100).**
- Then click enter and table with filtered data will be created.

Task 4: Calculate the total expenditure for all years for each country



To Perform this task:

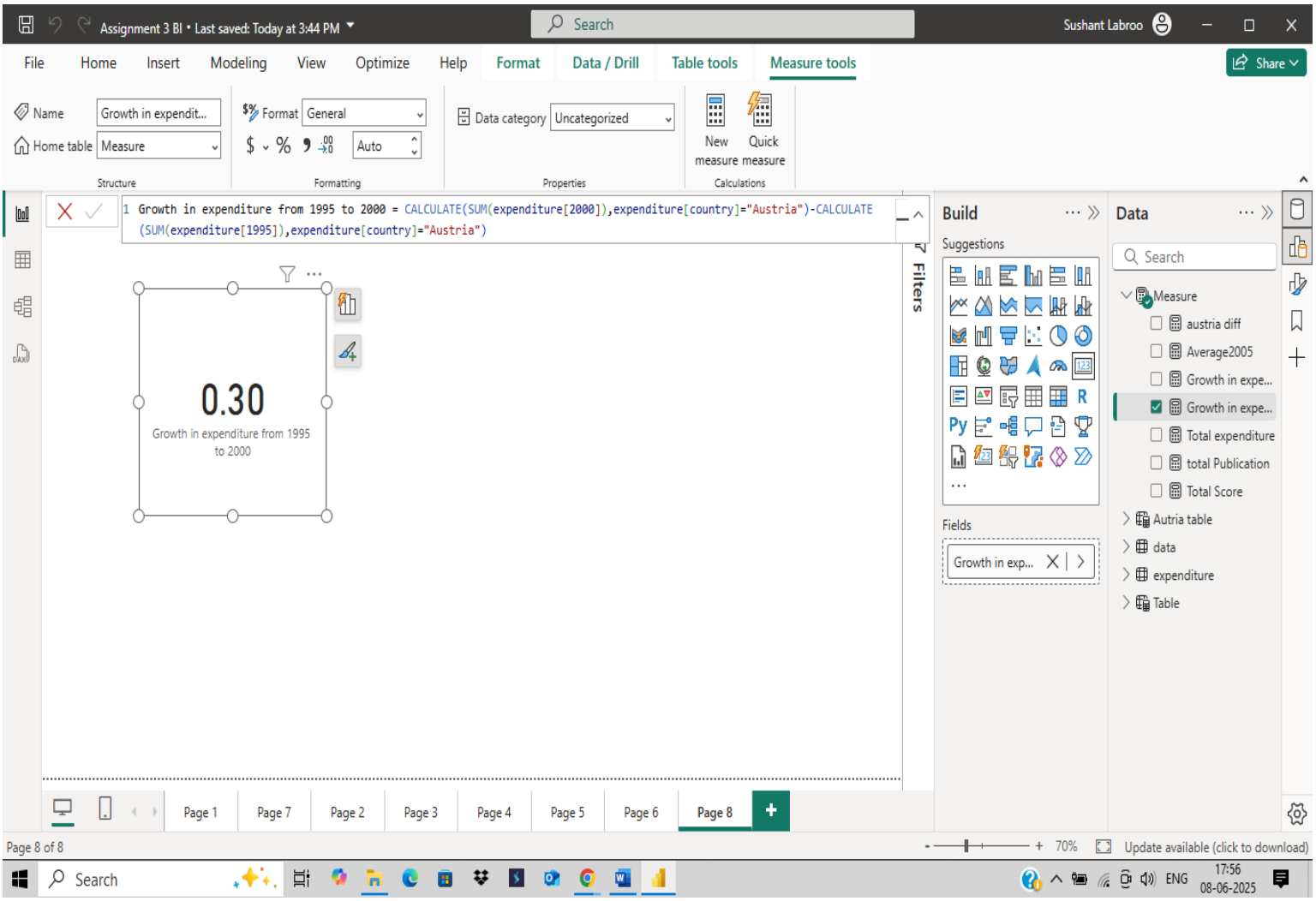
- Create a new measure named Total expenditure.
- Use DAX Formula
  Total expenditure = SUMX(expenditure, expenditure[1995]+ expenditure[2000]+ expenditure[2005]+ expenditure[2009]+ expenditure[2010]+ expenditure[2011])
- Create table visual add country and Total expenditure.

Task 5: Write a DAX formula to ignore any filters on the year column and calculate the total score across all years

- **DAX Formula -> Total Score = CALCULATE(SUM(data[score]),ALL(data[year]))**

  "ALL" function will remove all the filters if any to year column in data table.

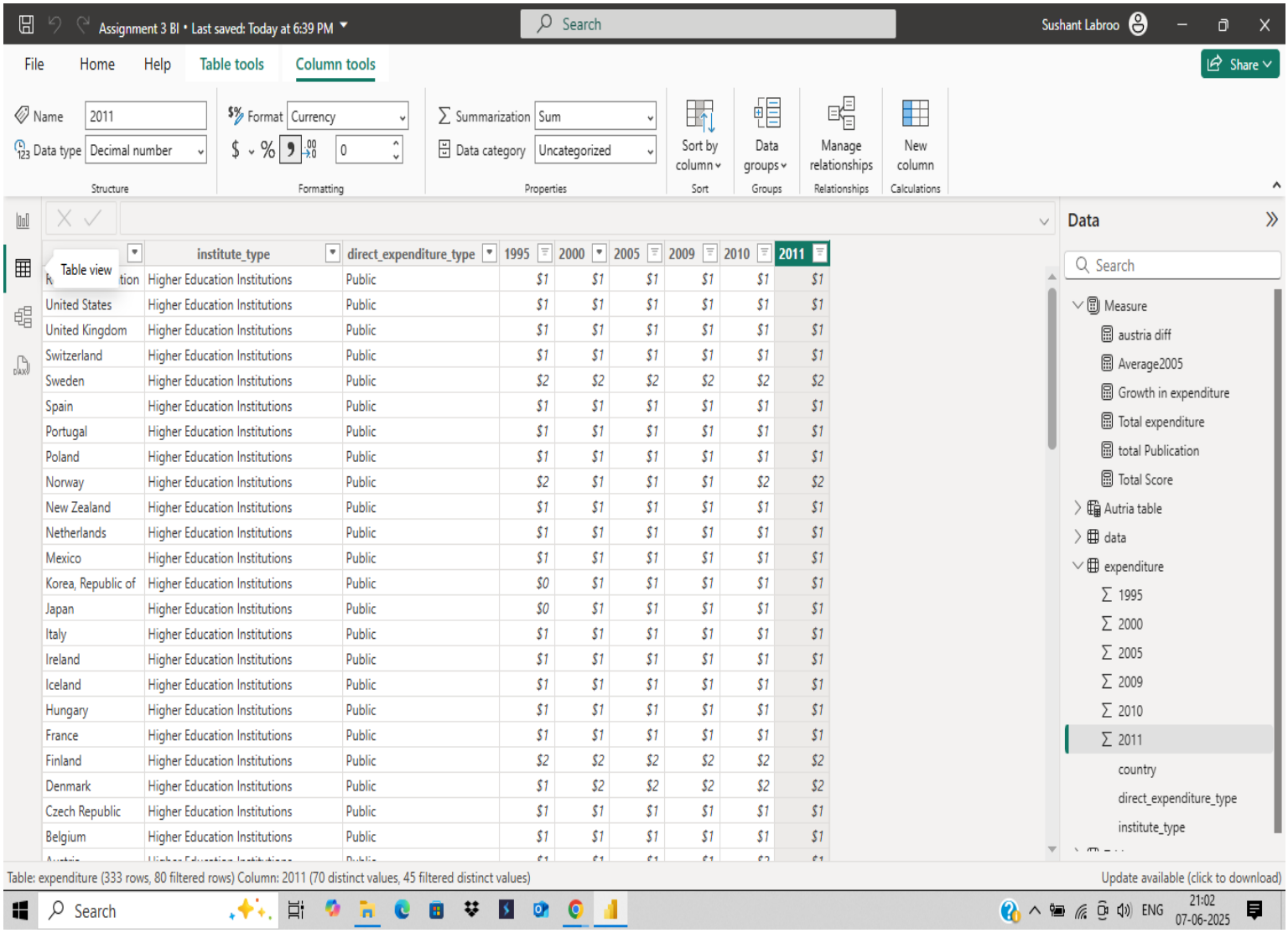
Task 6: Calculate the growth in expenditure for Austria from 1995 to 2000.



To Perform this task:

- Create a new measure named Growth in expenditure
- Use DAX Formula
  Growth in expenditure from 1995 to 2000 =
  CALCULATE(SUM(expenditure[2000]),expenditure[country]="Austria") –
  CALCULATE(SUM(expenditure[1995]),expenditure[country]="Austria")
- Use single card visual to see the output.

Task 7: Format the expenditure values to include a currency symbol and zero decimal places.

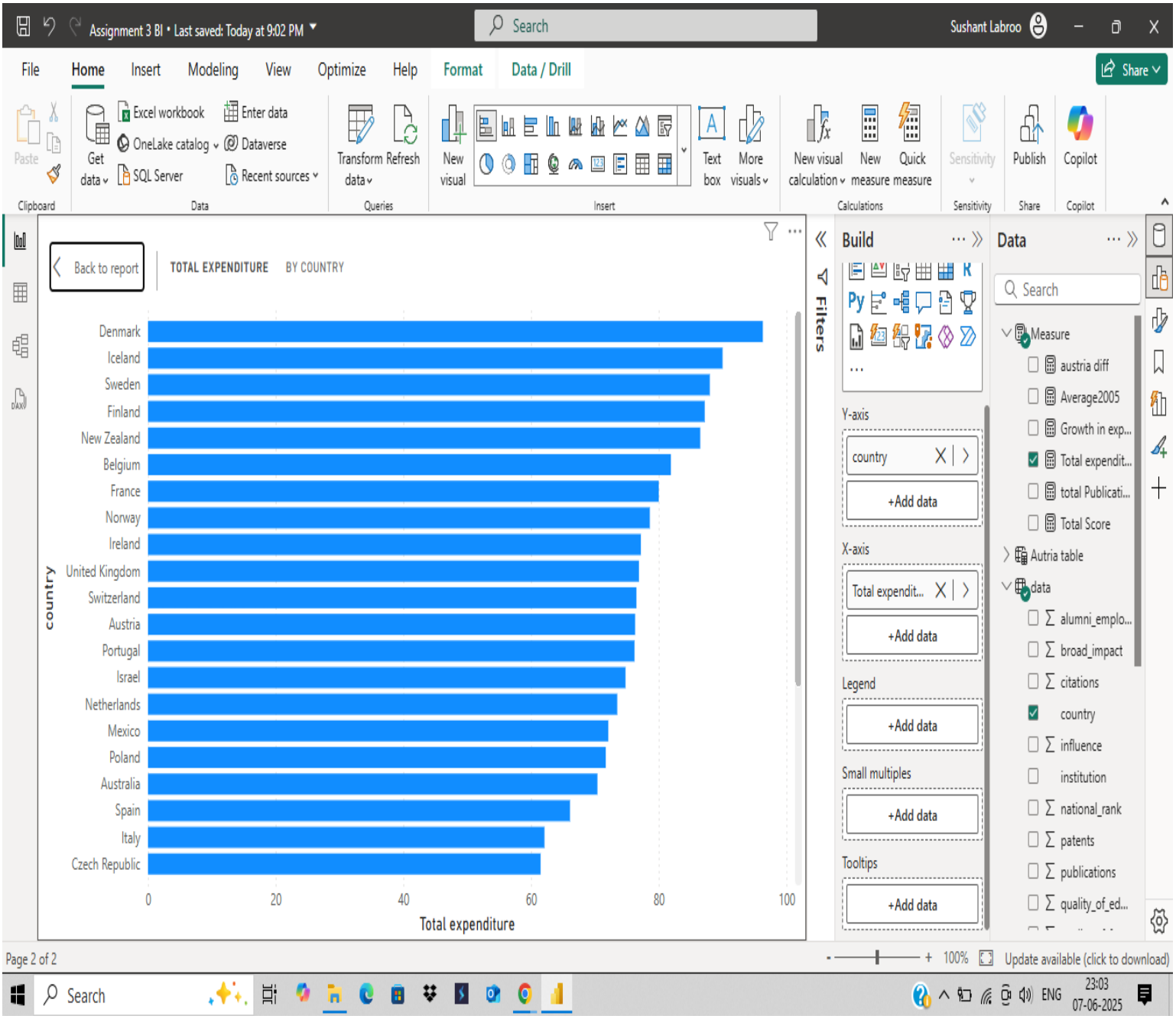


	institute_type	direct_expenditure_type	1995	2000	2005	2009	2010	2011
tion	Higher Education Institutions	Public	$1	$1	$1	$1	$1	$1
United States	Higher Education Institutions	Public	$1	$1	$1	$1	$1	$1
United Kingdom	Higher Education Institutions	Public	$1	$1	$1	$1	$1	$1
Switzerland	Higher Education Institutions	Public	$1	$1	$1	$1	$1	$1
Sweden	Higher Education Institutions	Public	$2	$2	$2	$2	$2	$2
Spain	Higher Education Institutions	Public	$1	$1	$1	$1	$1	$1
Portugal	Higher Education Institutions	Public	$1	$1	$1	$1	$1	$1
Poland	Higher Education Institutions	Public	$1	$1	$1	$1	$1	$1
Norway	Higher Education Institutions	Public	$2	$1	$1	$1	$2	$2
New Zealand	Higher Education Institutions	Public	$1	$1	$1	$1	$1	$1
Netherlands	Higher Education Institutions	Public	$1	$1	$1	$1	$1	$1
Mexico	Higher Education Institutions	Public	$1	$1	$1	$1	$1	$1
Korea, Republic of	Higher Education Institutions	Public	$0	$1	$1	$1	$1	$1
Japan	Higher Education Institutions	Public	$0	$1	$1	$1	$1	$1
Italy	Higher Education Institutions	Public	$1	$1	$1	$1	$1	$1
Ireland	Higher Education Institutions	Public	$1	$1	$1	$1	$1	$1
Iceland	Higher Education Institutions	Public	$1	$1	$1	$1	$1	$1
Hungary	Higher Education Institutions	Public	$1	$1	$1	$1	$1	$1
France	Higher Education Institutions	Public	$1	$1	$1	$1	$1	$1
Finland	Higher Education Institutions	Public	$2	$2	$2	$2	$2	$2
Denmark	Higher Education Institutions	Public	$1	$2	$2	$2	$2	$2
Czech Republic	Higher Education Institutions	Public	$1	$1	$1	$1	$1	$1
Belgium	Higher Education Institutions	Public	$1	$1	$1	$1	$1	$1

To Perform this task:

- Go to table view > Select the column > Column tools
- Under that there is format drop down menu select currency and change to $ sign.
- Next to that is the decimal places box write 0 and it will remove all decimal places.

Task 8: Calculate the total expenditure for each country.

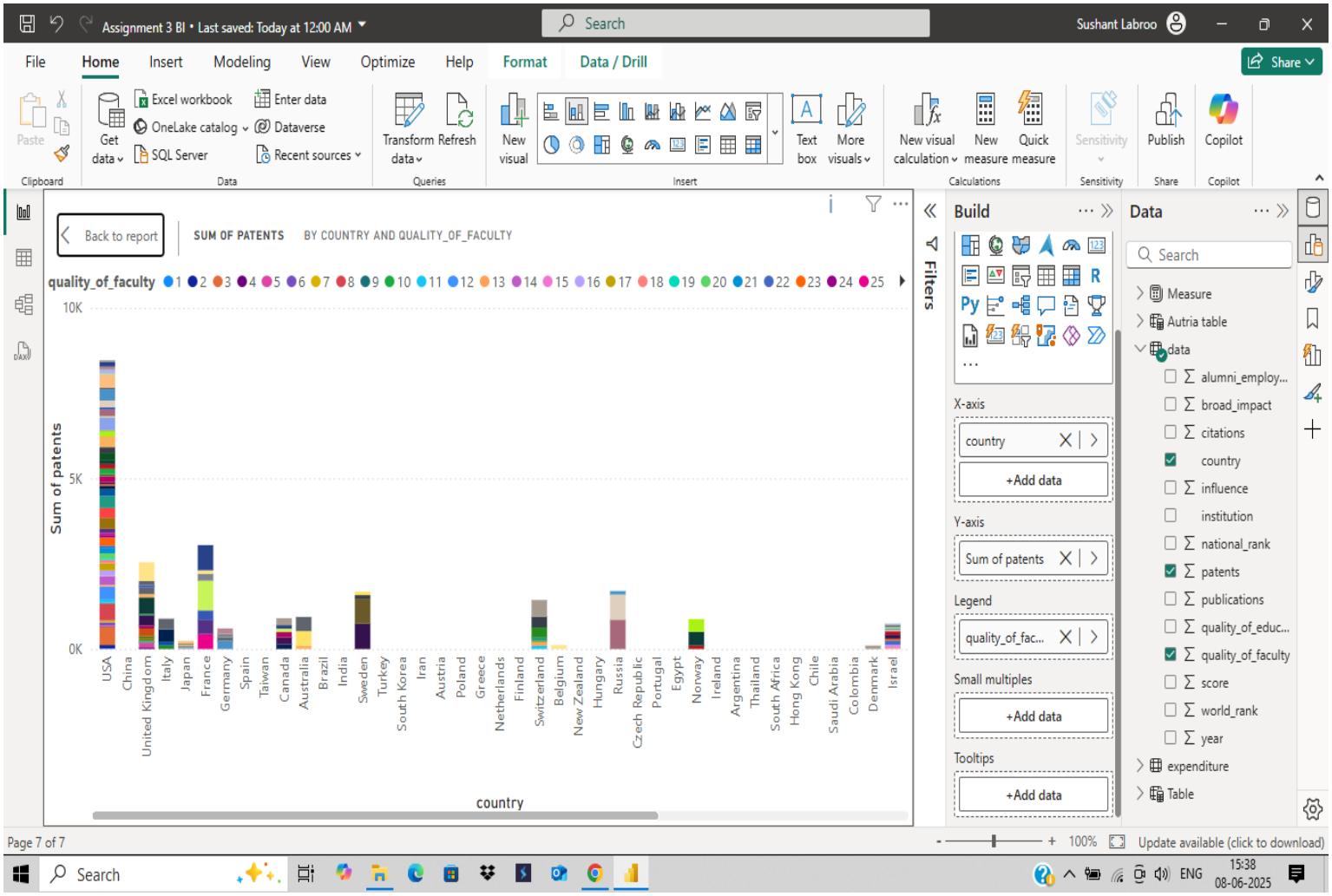


To Perform this task:

- Create a new measure named Total expenditure.
- Use DAX Formula
  Total expenditure = SUMX(expenditure, expenditure[1995]+ expenditure[2000]+ expenditure[2005]+ expenditure[2009]+ expenditure[2010]+ expenditure[2011])
- Create bar chart visual add country and Total expenditure.

Task 9: Create a report showing each visual in different sheets:

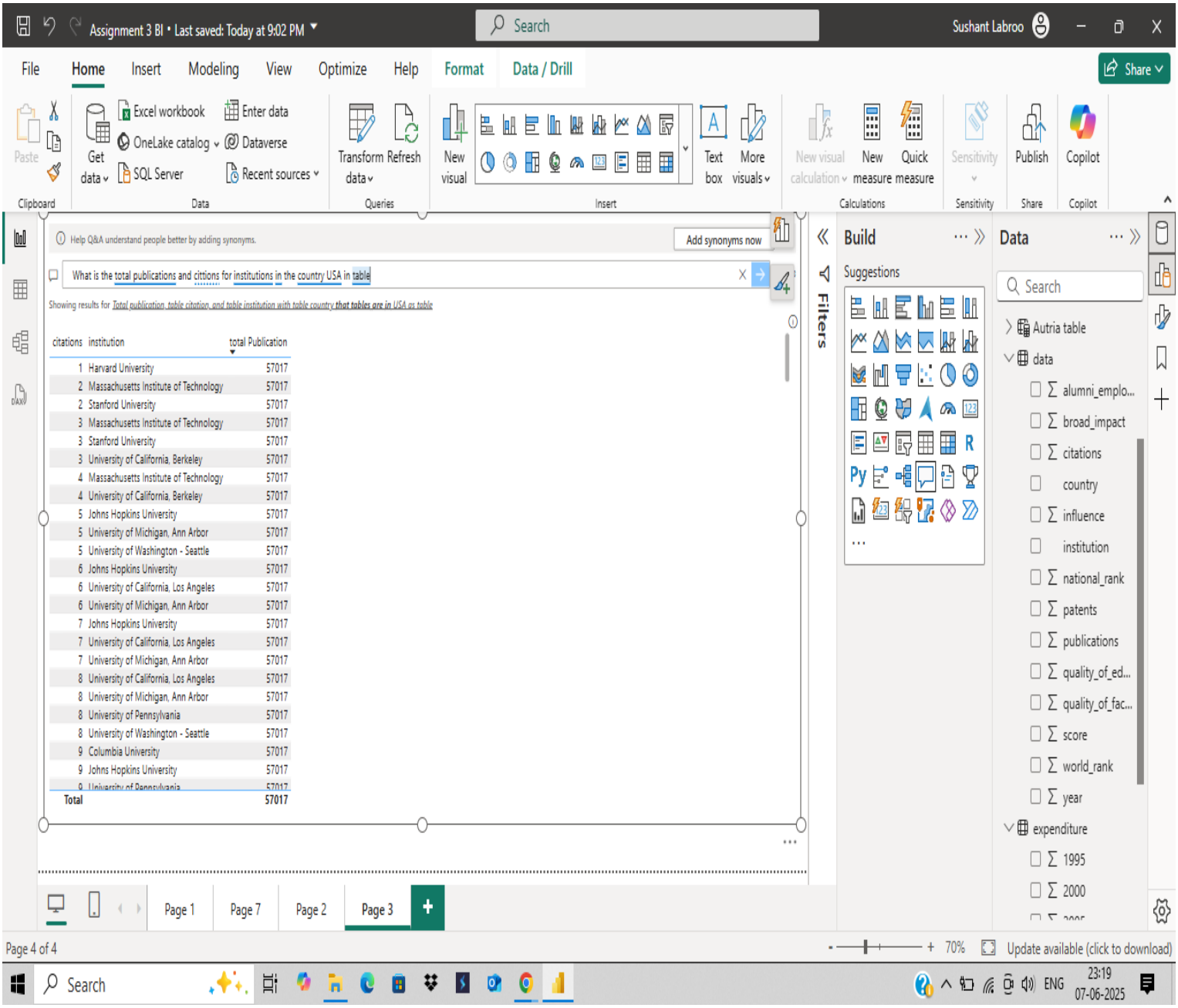
(a) Break down the total patents of institutions by country and then by quality of faculty. Analyze which factors contribute most to the number of patents across different countries.



To Perform this task:

- Select a column chart visual
- **Add country in x-axis, sum of patents in y-axis, and quality_of_faculty in Legend.**

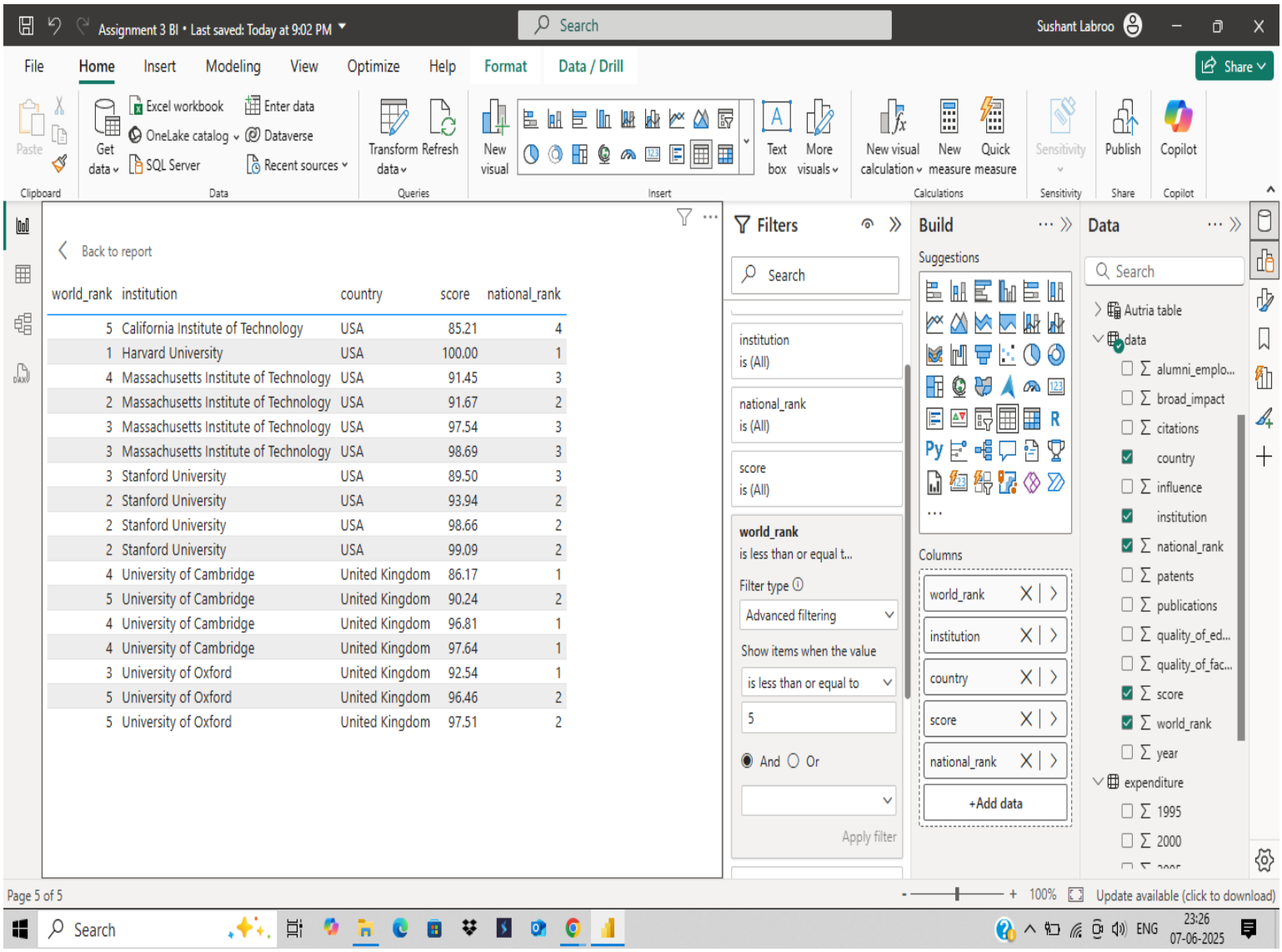
(b) Use the Q&A feature in Power BI to answer the question: "What is the total publications and citations for institutions in the USA?" and display the results in a table and bar chart format.



To Perform this task:

- Select the Q/A visual from the build pane.
- Write in the box What is the total publications and citations for institutions in USA in table form.
- It will show output in the table form.

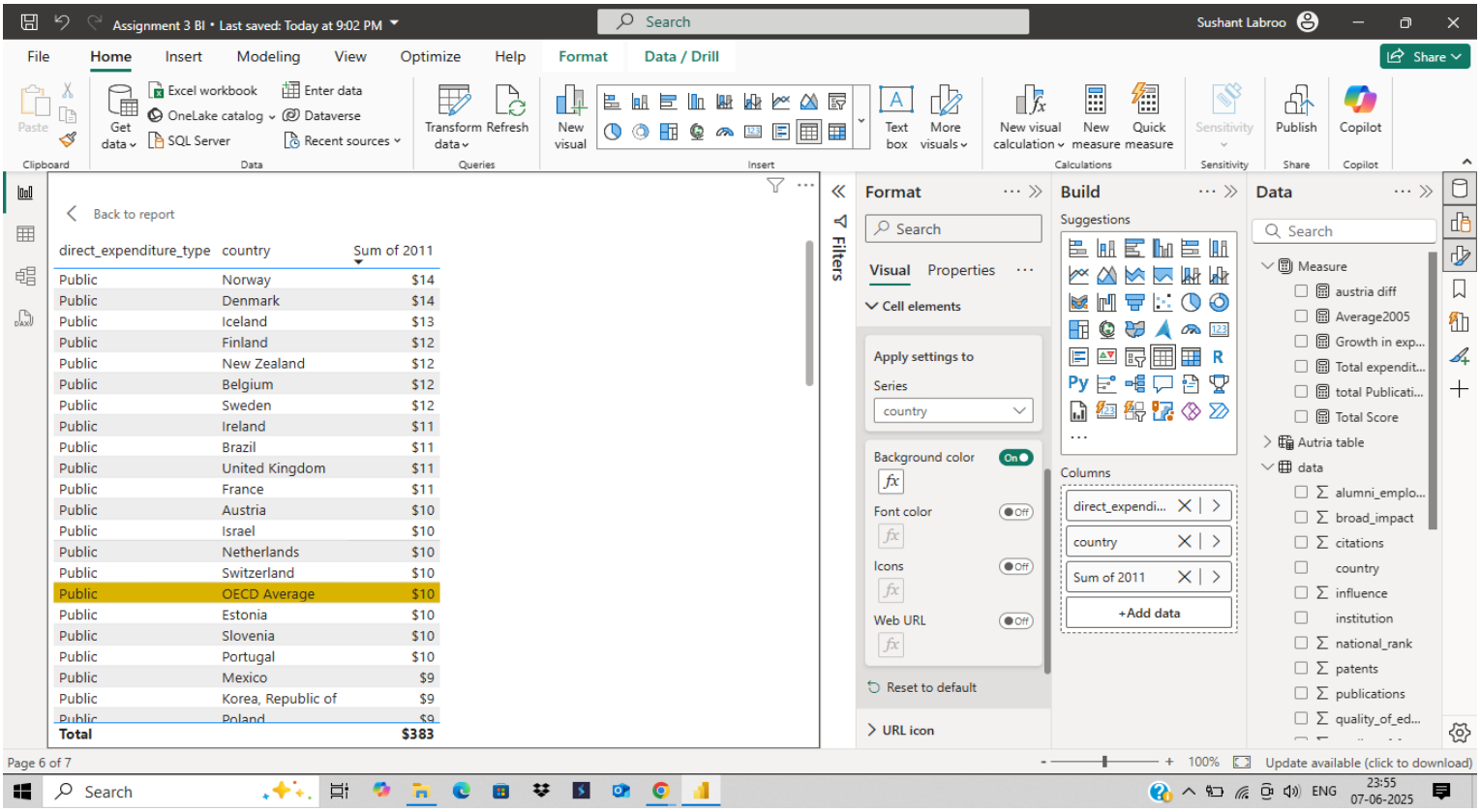
(c) Display key metrics for the top 5 institutions by world rank, including fields such as institution, country, score, and national rank.



To Perform this task:

- Select a table visual
- Add world_rank, institution, country, score, national_rank.
- Then go to Filters pane
- Select the world_rank box
- Change filter type to Advanced filtering.
- Under Show items when value > is less than or equal to > 5.
- Apply filter.

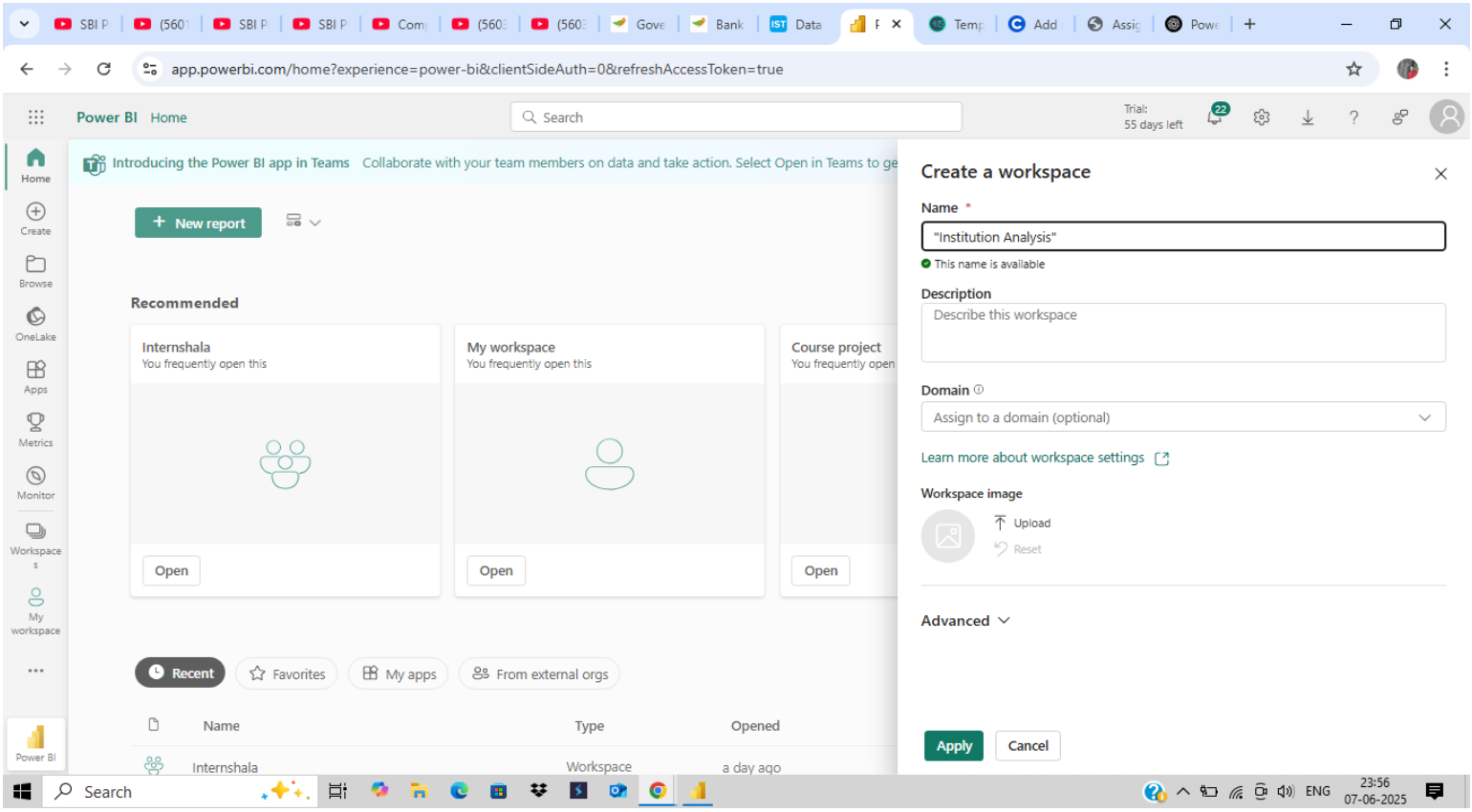
(d) Represent the distribution of direct_expenditure_type (e.g., public vs. private) for the year 2011 across all countries. Highlight the OECD Average as a separate segment.

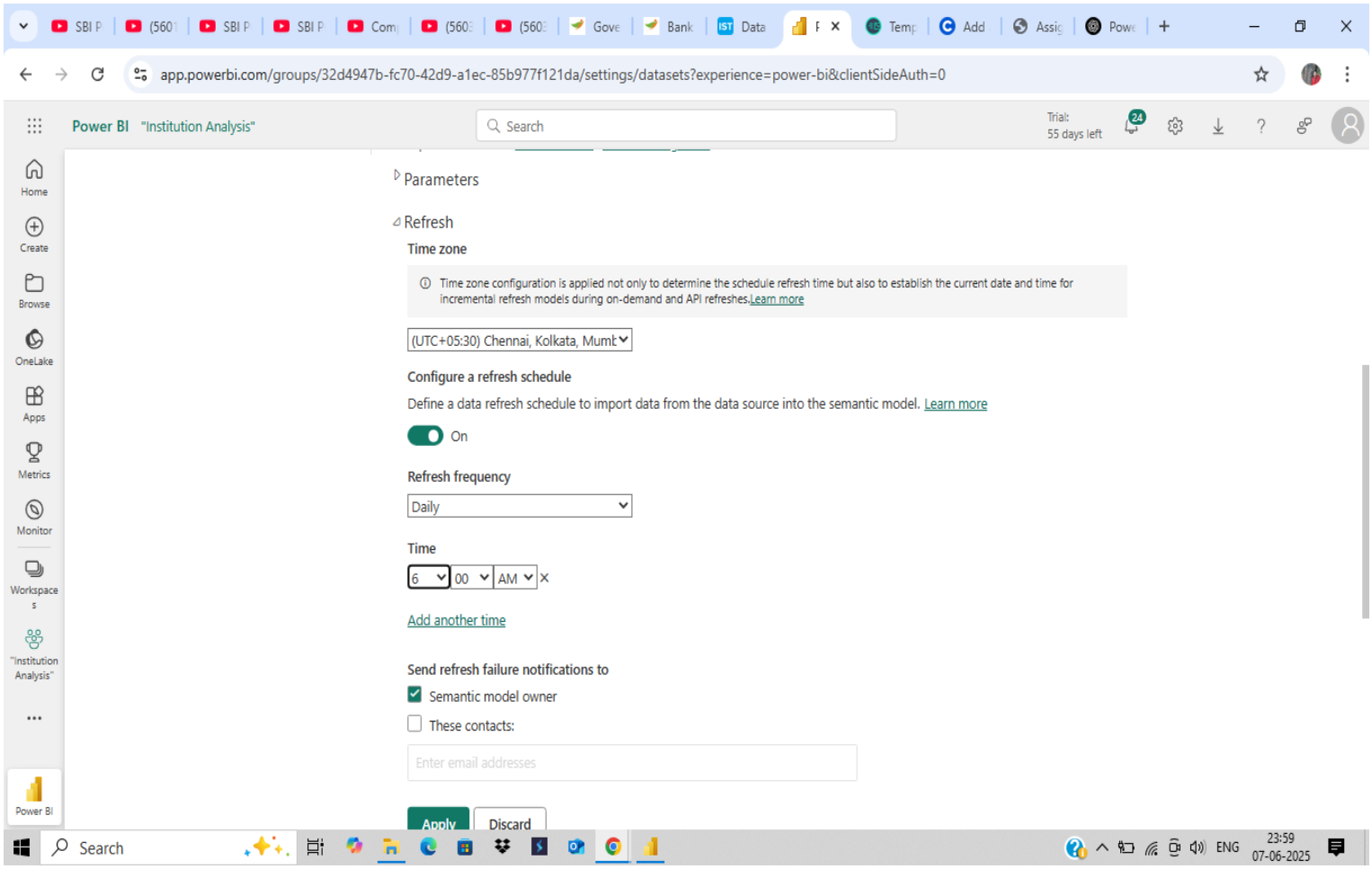


To Perform this task:

- Select a table visual > Add direct_expenditure_type , country, Sum of 2011.
- Then Go to Filters pane > direct_expenditure_type > fliter only private and public.
- Then go to format pane > **cell elements** and Highlight data where country is OECD Average.

Task 10: Create a workspace "Institution Analysis" and set up a schedule to refresh the datasets every day at 6 AM.





To Perform this task:

- Go to Power BI Service > Workspaces > New Workspaces > Name it as **"Institution Analysis".**
- You can also write description, upload image then click apply.
- New workspace will be created.

Schedule a Refresh:

- First publish report to Power BI Service
- Go to workspace > settings > Power BI settings > semantic models > Refresh.
- Set the time zone first
- Refresh frequency to Daily.
- Set the time to 6 A.M.