

Capstone Project - University Success Analysis



Key Objectives

❑ Data Exploration and Understanding

- We will perform Exploratory Data Analysis (EDA) using SQL and Excel to understand the dataset thoroughly and identify any patterns, trends, or outliers. This includes examining the distribution of rankings, understanding the impact of different criteria on rankings, and analyzing changes over time.

❑ Data Aggregation and Transformation

- Aggregate and transform the data as needed to make it suitable for analysis and visualization. This includes cleaning, merging tables, and creating calculated fields if necessary.

❑ Visualization in Power BI:

- Develop a comprehensive Power BI dashboard that allows users to interact with the data and gain insights into university rankings, criteria impact, and changes over time.



OBJECTIVE - The objective of this project is to compare university rankings across different systems, assess the influence of various ranking criteria on university positions, and analyze changes in university performance metrics over time.



GOAL - The goal of this project is to compare university rankings across different systems, assess how ranking criteria influence university positions, and analyze trends in university metrics over time to provide insights into the factors driving these rankings.



ANALYSIS - The analysis reveals that specific ranking criteria, such as research output and academic reputation, significantly influence university positions across different systems, highlighting the need for universities to strategically focus on these areas to improve their global rankings.



Insights and Recommendations

- **Impact of Criteria:** Identify which ranking criteria have the most significant impact on the overall ranking.
- **University Performance Over Time:** Analyze which universities have improved or declined in rankings and explore possible reasons.

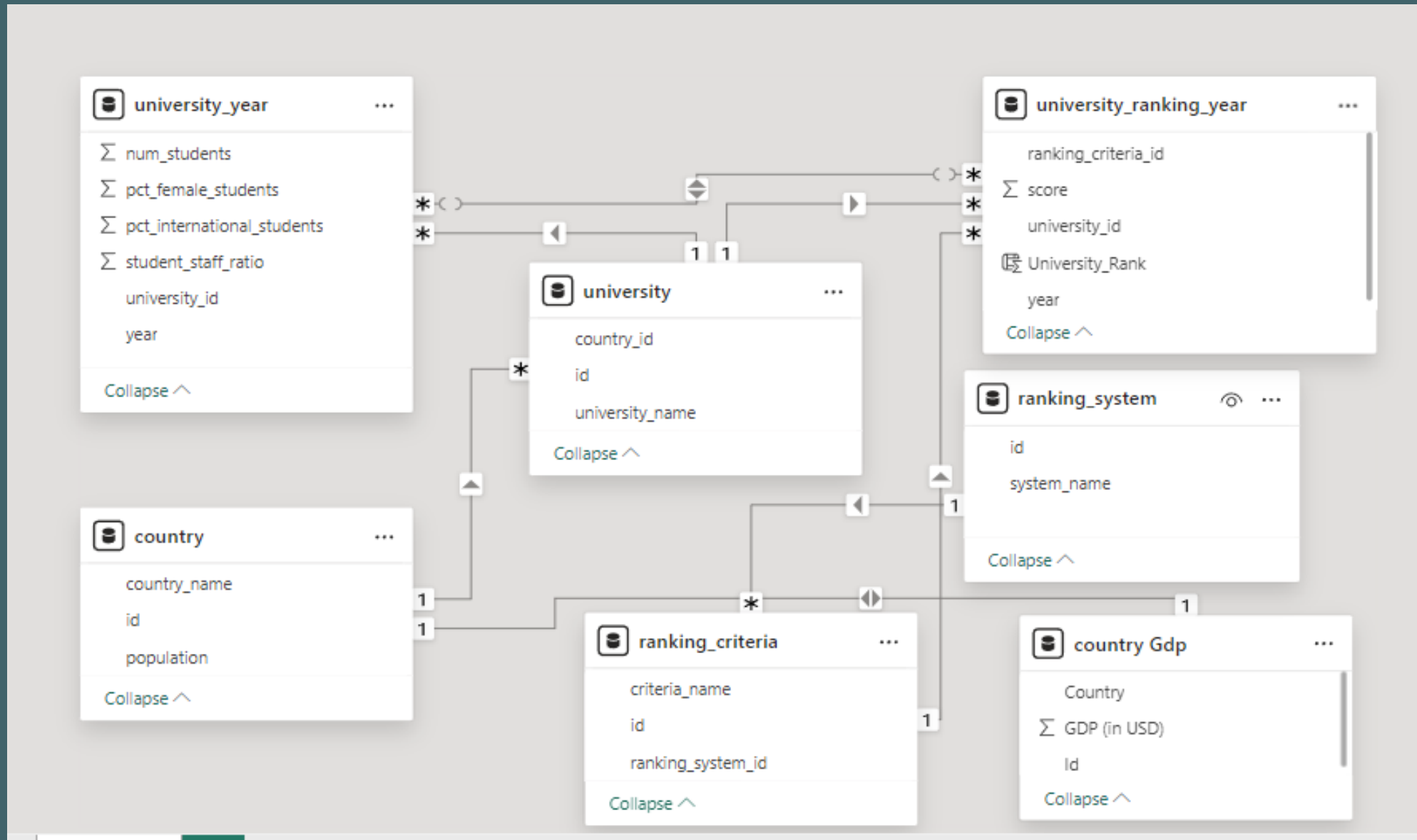


Report: The report provides an in-depth analysis of university rankings across different systems, examining the influence of ranking criteria on university positions and tracking changes in university metrics over time. It includes detailed data aggregation, exploratory analysis, and insights derived from SQL queries and Excel analysis, with visualizations in Power BI to support the findings.



Presentation: The presentation summarizes the key findings and insights from the project, highlighting the comparative analysis of university rankings, the impact of various criteria on rankings, and trends observed in university metrics over time. It is designed to convey the most critical information visually and succinctly.

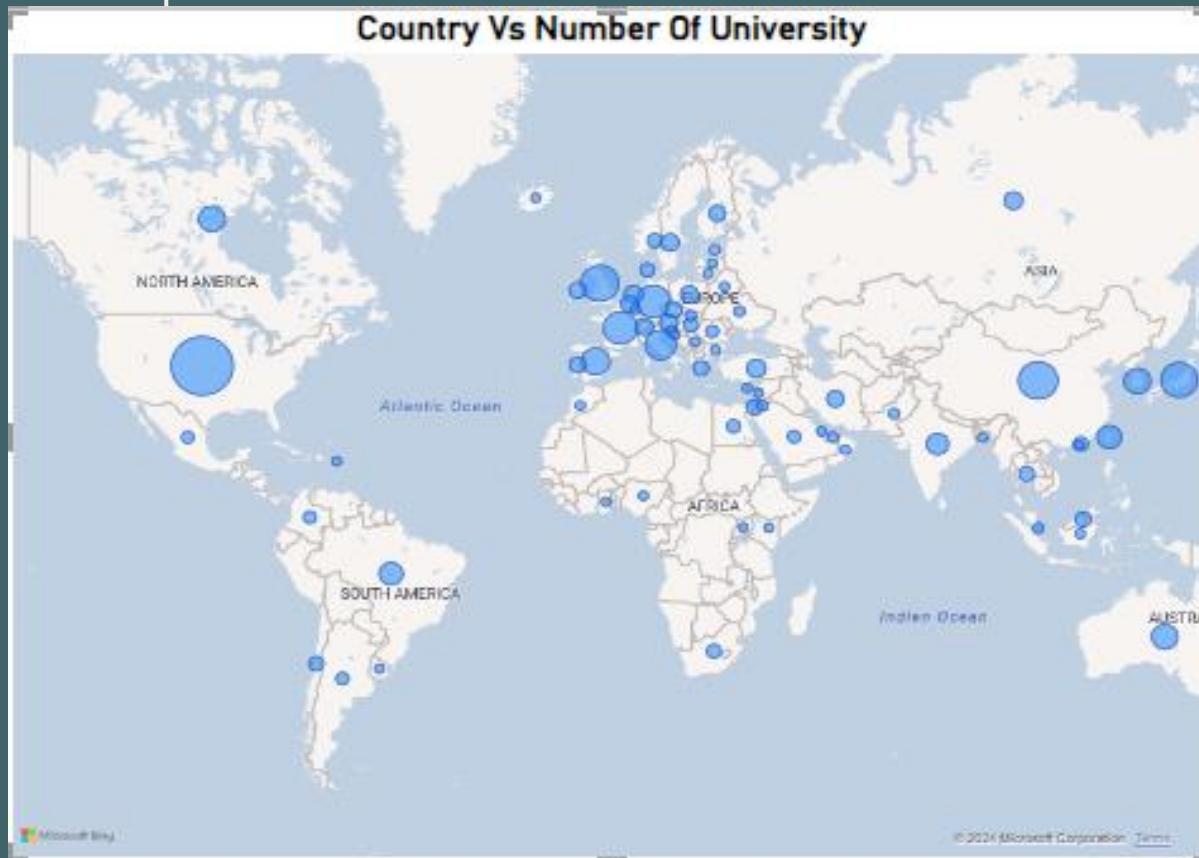
- ER DIAGRAM



POWER BI PROBLEM STATEMENTS

Enhancing Data Connections for Better Analysis

- How many universities are there in each country?



This approach will give us a clear visual representation of how many universities are present in each country like United States of America ,China, United kingdom, Japan and France are top five country. we can easily identify the countries with the most universities.

- What is the distribution of international students across different countries?

Distribution of International Students By Different Countries



Certain countries, such as the United States, the United Kingdom, Canada, and Australia, dominate in attracting international students due to their strong educational reputations.

- Which country has the highest number of female students enrolled in universities?

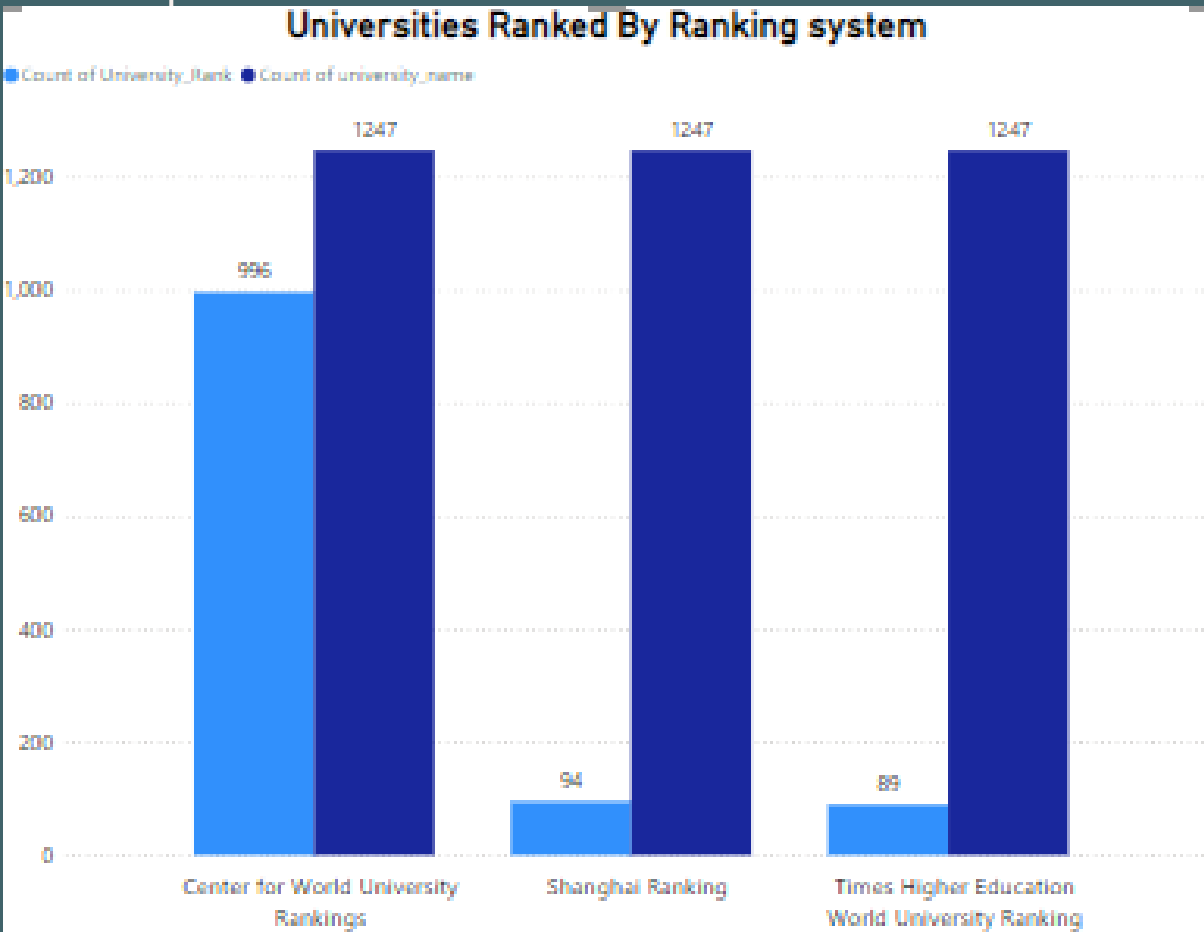
Number of Female Students By Country



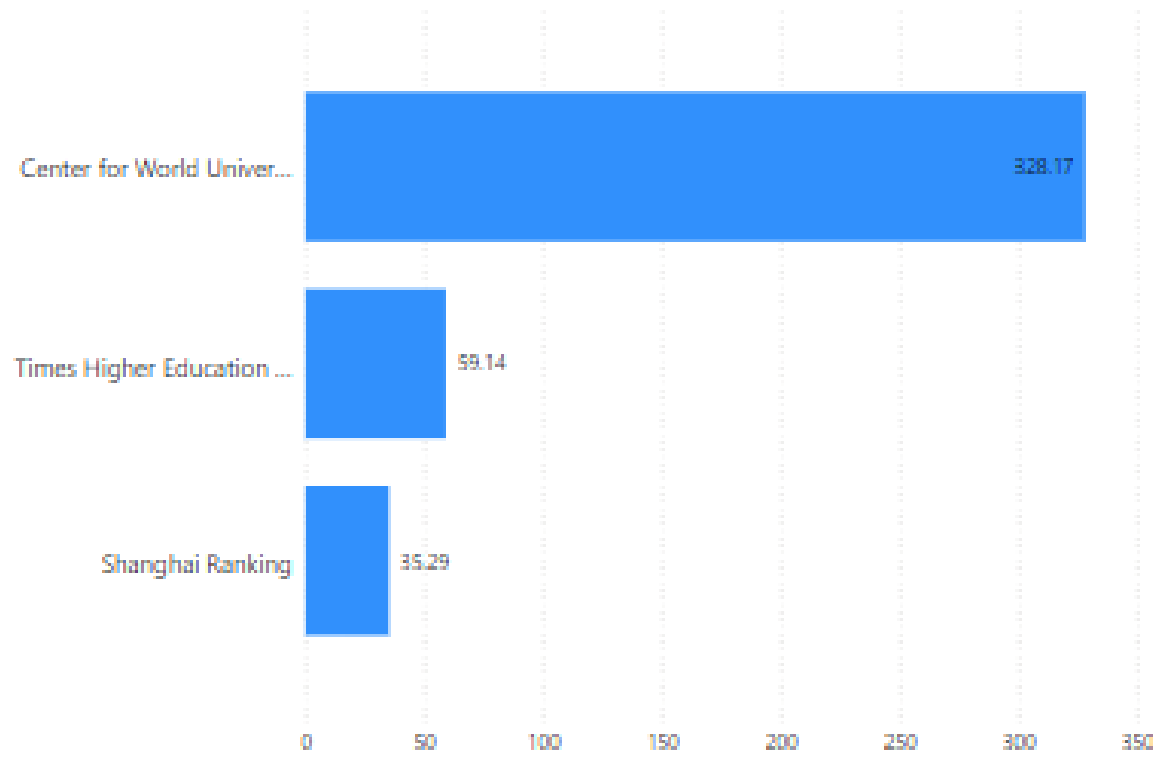
Certain countries, such as the United States, the United Kingdom, Germany Netherlands, and Australia, reflects strong gender participation in higher education, possibly due to supportive educational policies, cultural factors, or a larger overall population of students. This trend highlights the country's commitment to gender equity in education.

- How many universities are ranked by each ranking system?

The number of universities ranked by each ranking system varies, reflecting the scope and criteria used by each system. Some ranking systems may focus on a select group of top universities globally, while others include a broader range, indicating differences in evaluation focus and regional coverage.



Average Score For Universities By Each Ranking System

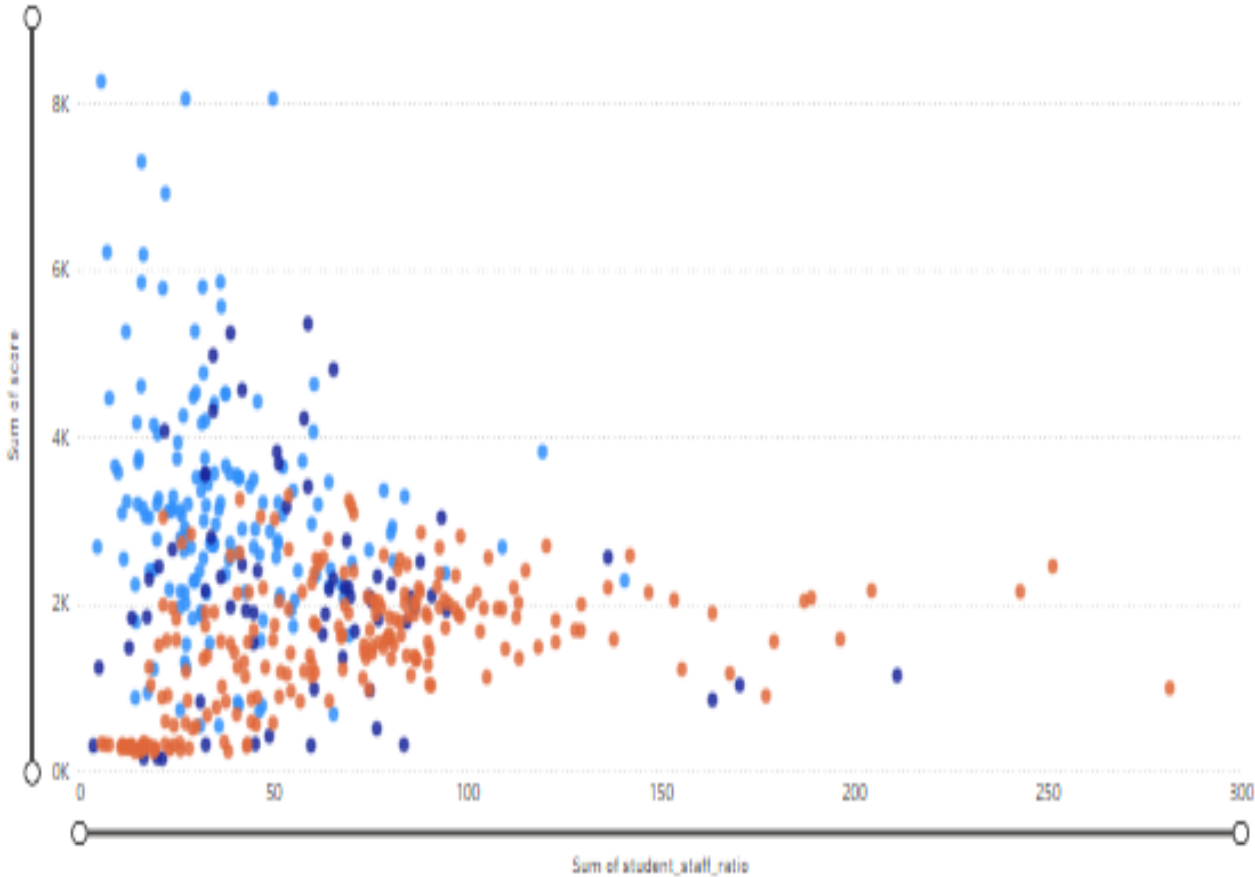


- What is the average score for universities according to each ranking system?

The average score for universities differs across ranking systems, highlighting variations in evaluation criteria and scoring methodologies. These differences reflect each system's unique focus and approach to ranking institutions.

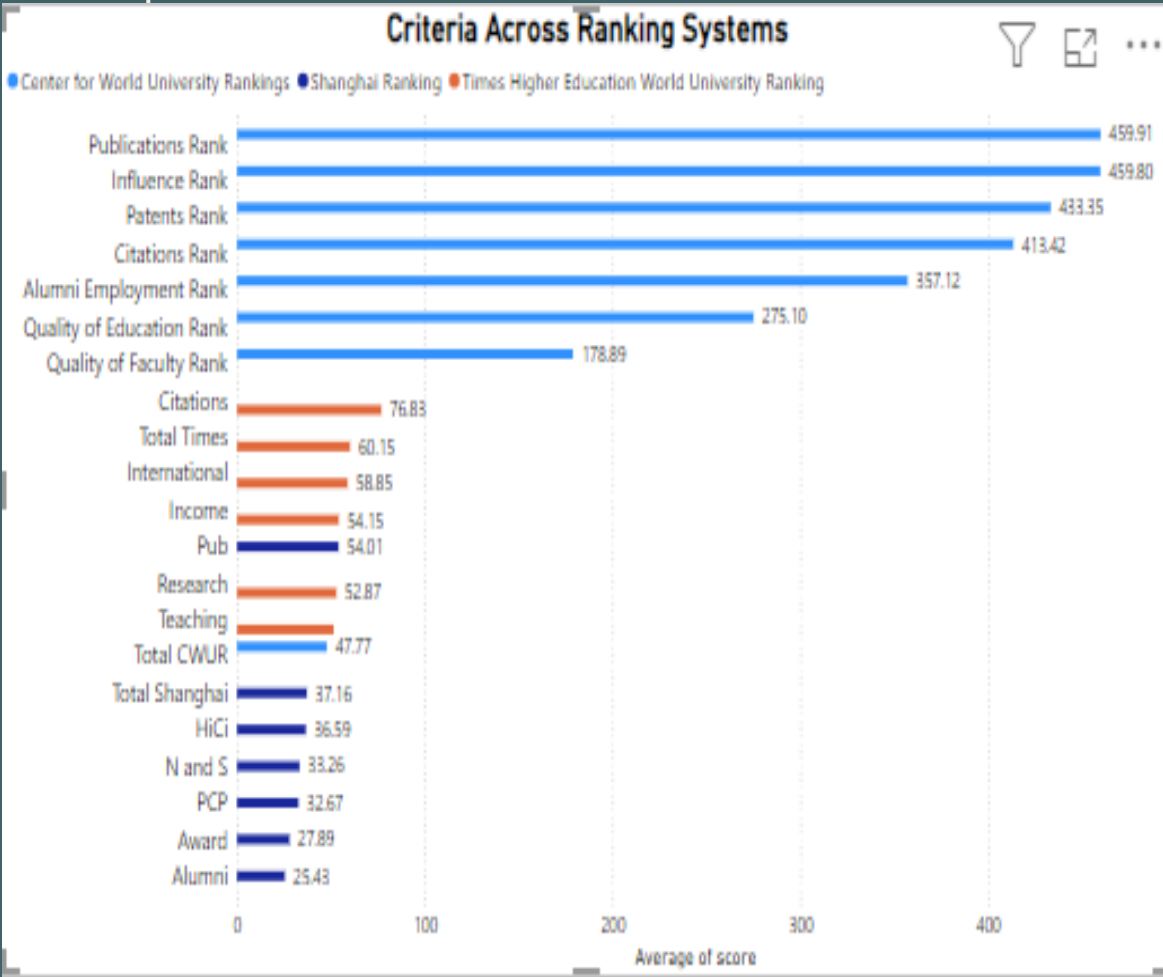
Ranking System By University's Student-Staff Ratio

system_name ● Center for World University Rankings ● Shanghai Ranking ● Times Higher Education World University Ranking



- How does the ranking system affect a university's student-staff ratio?

Ranking systems impact a university's student-staff ratio, with those aiming for higher rankings often reducing the ratio to improve their standing

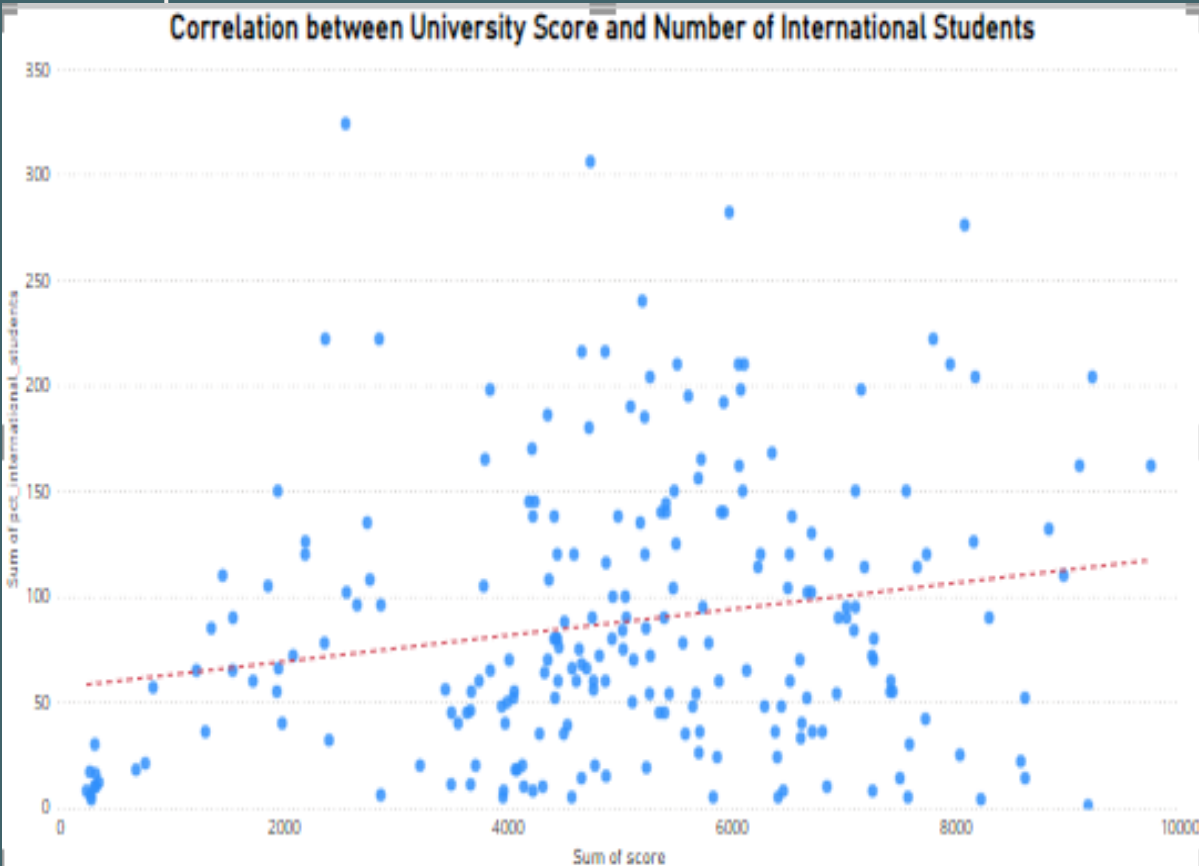


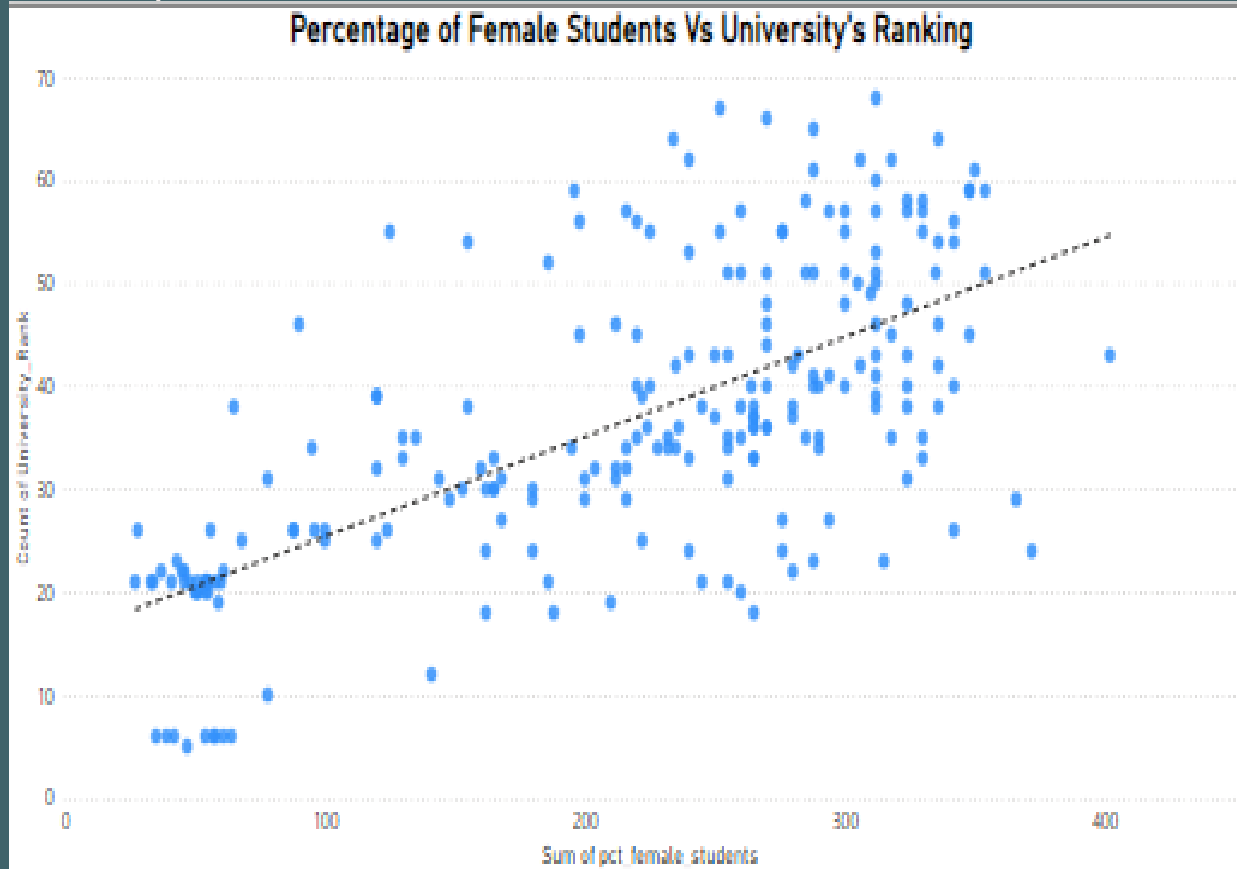
- What are the most important criteria considered by ranking systems?

The most important criteria considered by ranking systems typically include Publications Rank, Influences Rank, Patterns Rank and Custom Rank. These factors heavily influence a university's overall criteria by ranking systems, reflecting its global reputation and educational standards.

- Is there a correlation between a university's score and the number of international students?

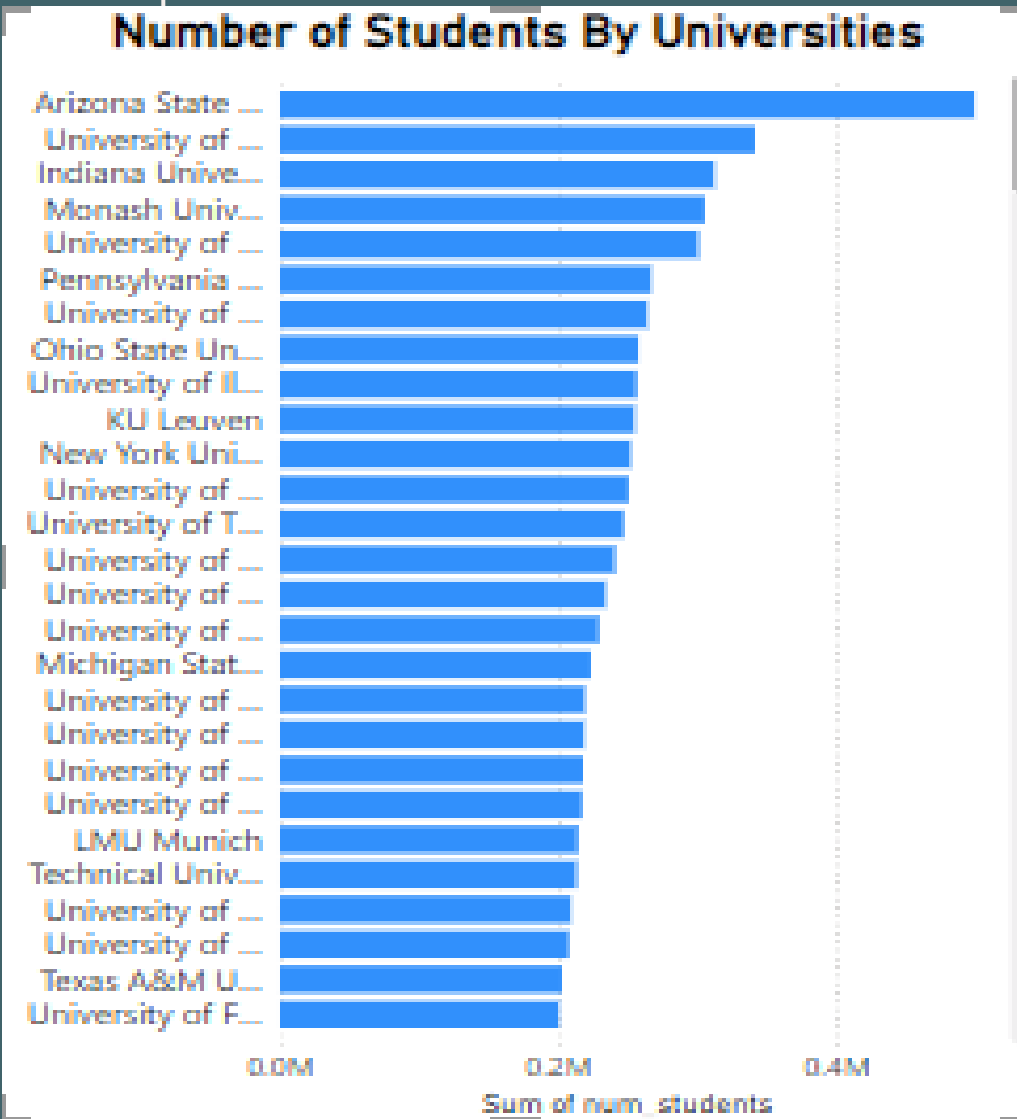
Yes, there is a positive correlation between a university's score and the number of international students. Higher-scoring universities tend to attract more international students due to their global reputation and academic excellence. This correlation reflects the university's appeal on an international scale.





- How does the percentage of female students impact a university's ranking?

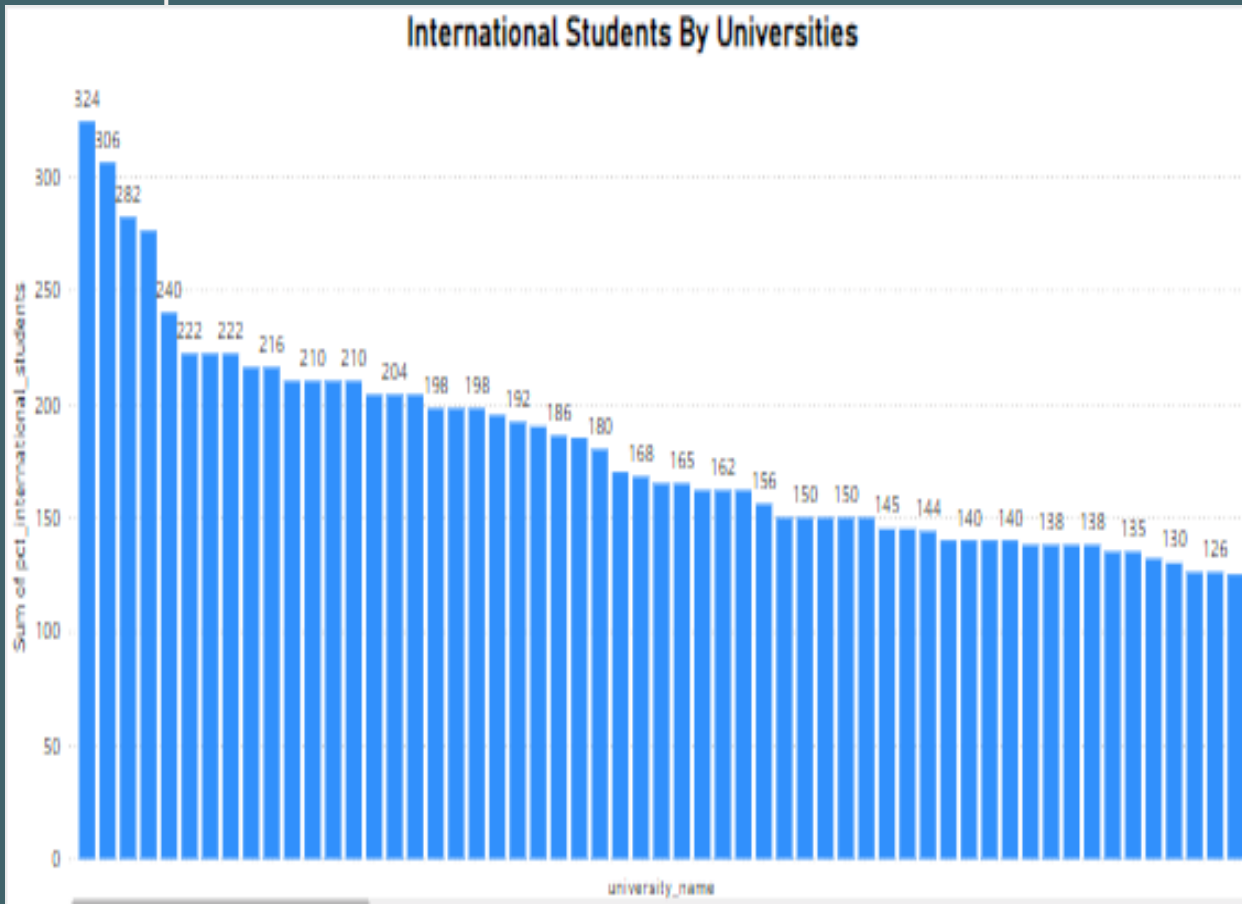
The percentage of female students can positively impact a university's ranking, particularly in systems that value diversity and inclusion. Higher gender diversity is often associated with better institutional reputation and student satisfaction, contributing to an improved ranking. However, the impact varies depending on the specific criteria of each ranking system.



- Which university has the highest number of students?

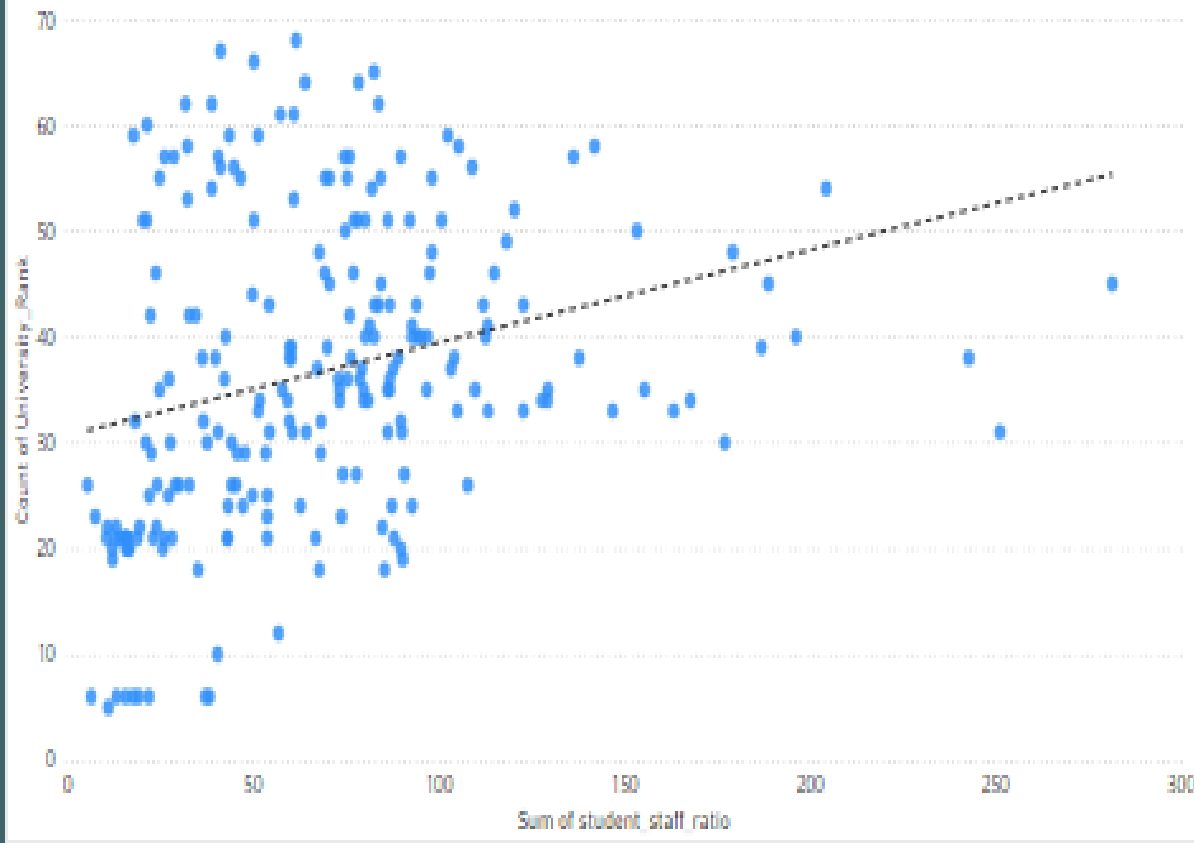
The university with the highest number of students is [Arizona State University]. This institution stands out due to its large-scale enrollment, reflecting its capacity and appeal to a broad student base. Such a high student population may also indicate extensive resources and diverse program offerings.

- How does the percentage of international students vary across different universities?



The percentage of international students varies widely across universities, with top-ranked institutions generally attracting a higher proportion. This variation reflects differences in global reputation, available resources, and the emphasis placed on internationalization.

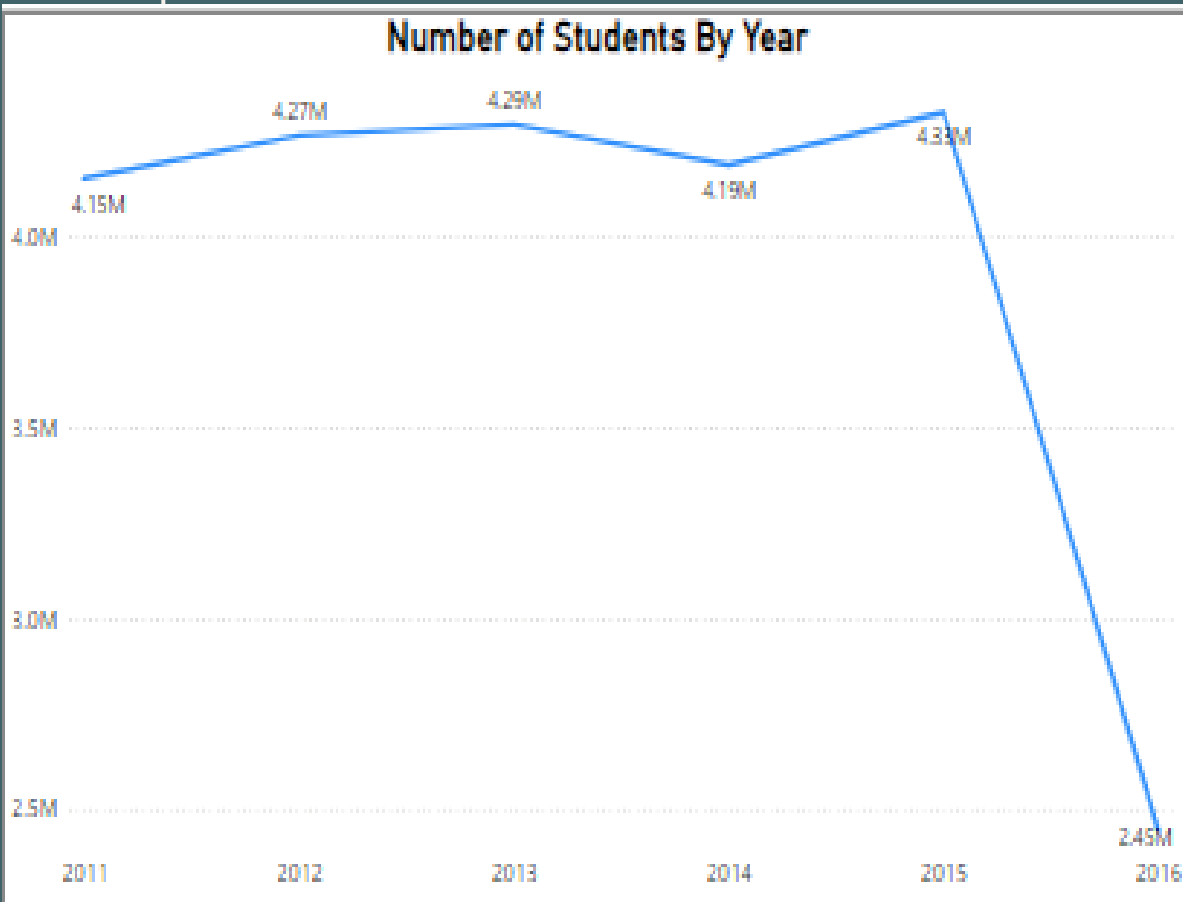
Student-Staff Ratio By University's Ranking



- Is there a correlation between a university's ranking and its student-staff ratio?

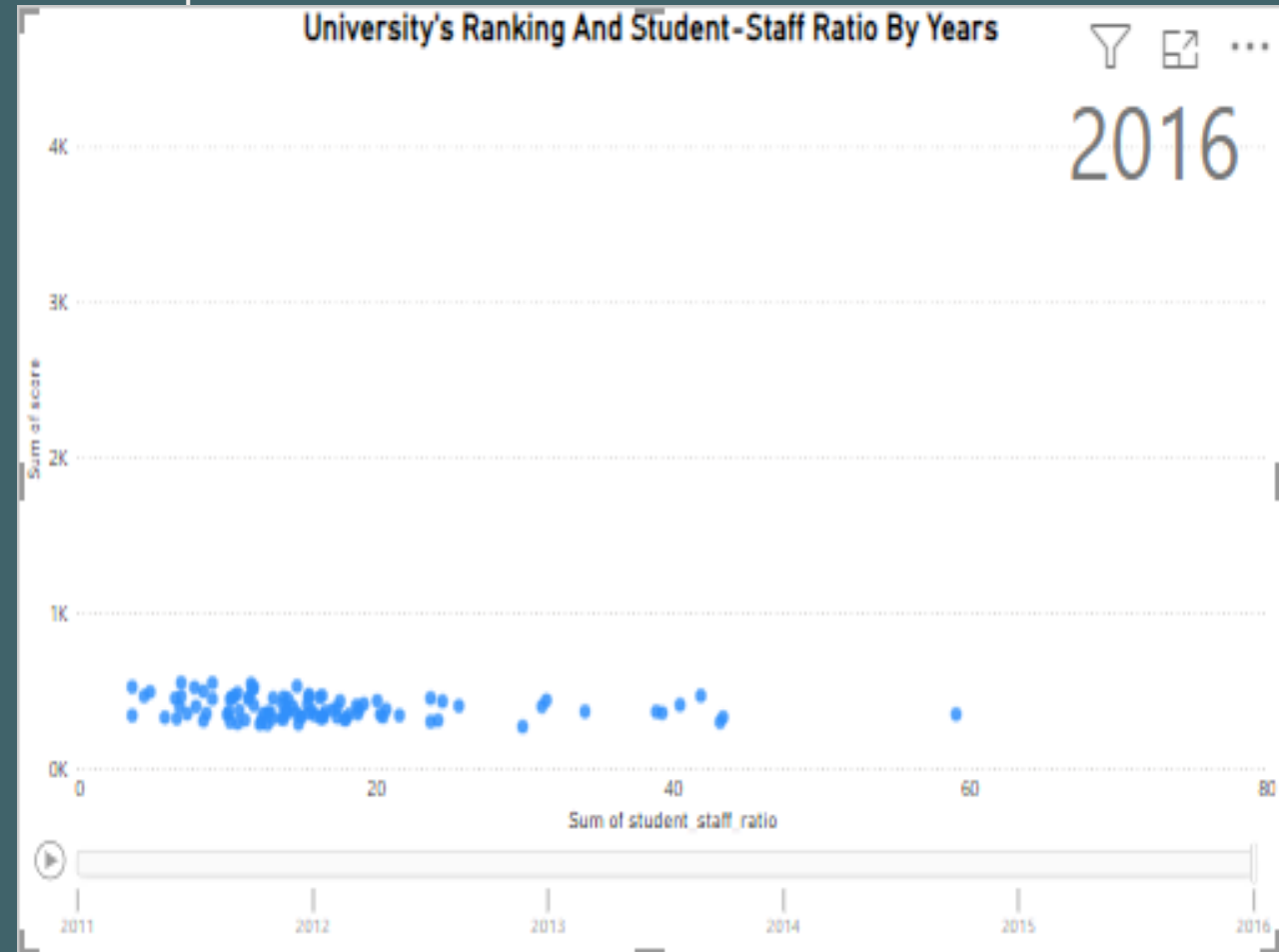
Yes, there is typically a correlation between a university's ranking and its student-staff ratio. Universities with a lower (better) student-staff ratio often achieve higher rankings due to the enhanced quality of education and personalized attention. This ratio is a key factor in ranking systems that emphasize teaching excellence.

- How does the number of students in universities change over time?

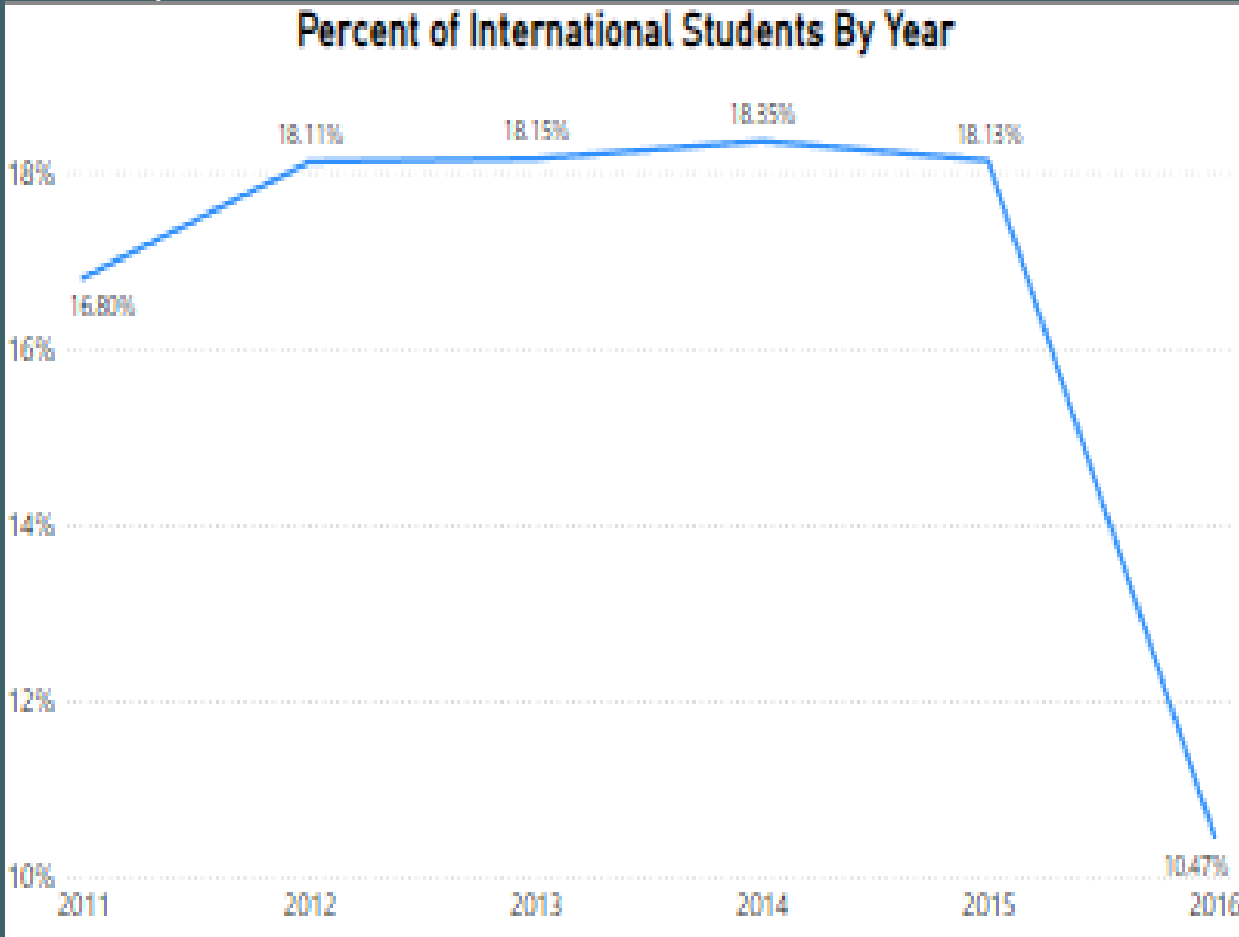


The number of students in universities are increasing and decreased over time at the end of the year in 2016 the number of students are declined. The universities might need to investigate the reasons for declining student numbers.

- Is there a correlation between a university's ranking score and the student-staff ratio over the years?



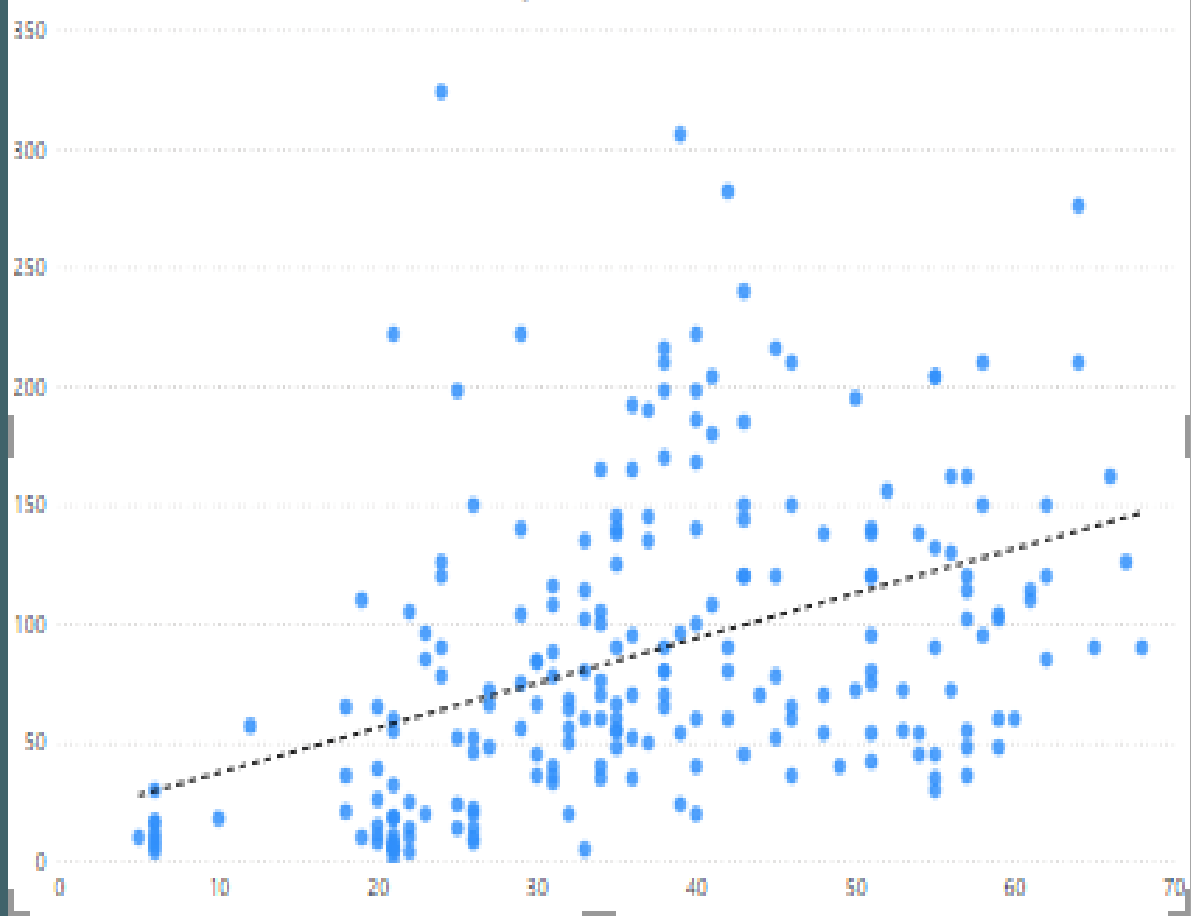
There is a positive correlation between a university's ranking score and its student-staff ratio, it suggests that as the student-staff ratio improves (indicating more staff per student), the university's ranking tends to improve as well.



- How does the percentage of international students vary across different years?

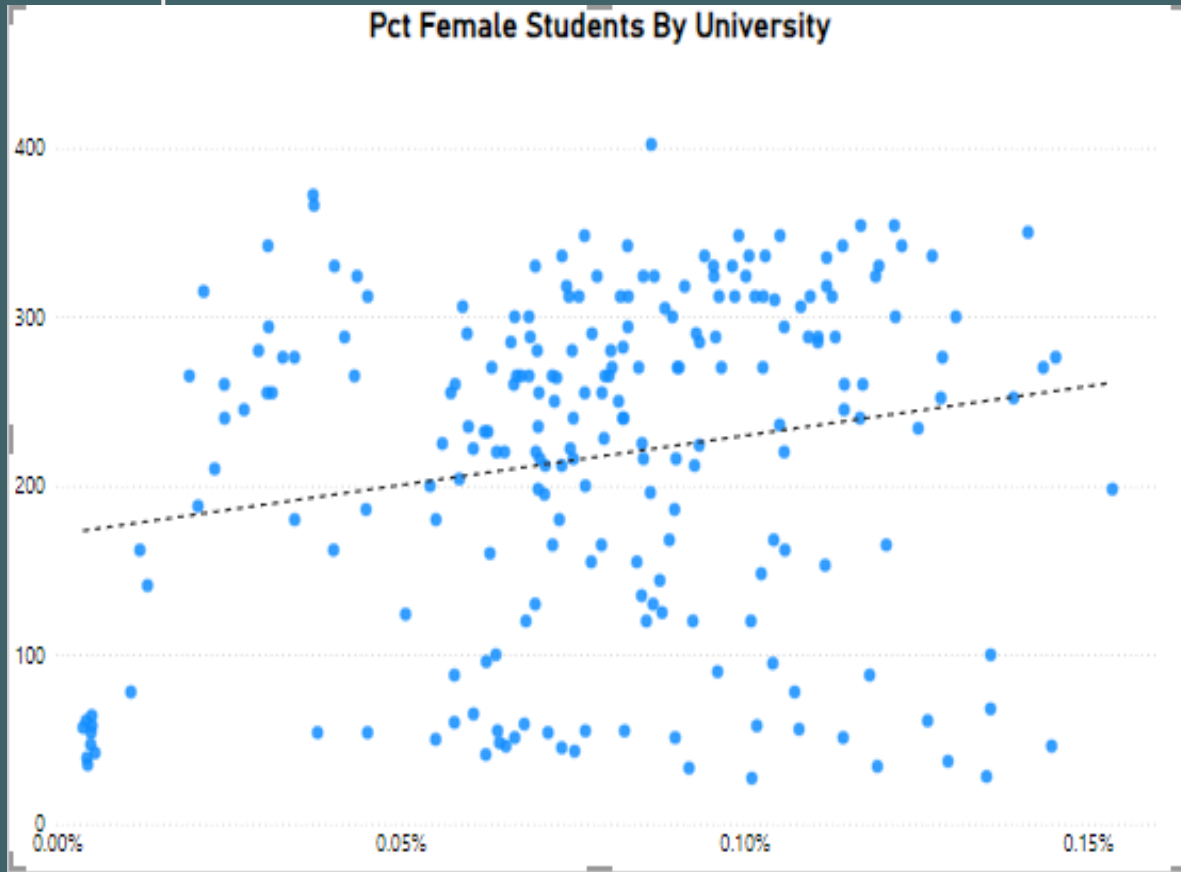
The percentage of international students is decreasing, it may indicate challenges such as stricter visa policies, economic downturns, or reduced global mobility. Universities might need to address these issues to attract and retain international students.

University Score Vs Students



- What is the impact of a university's ranking on the number of international students it attracts?

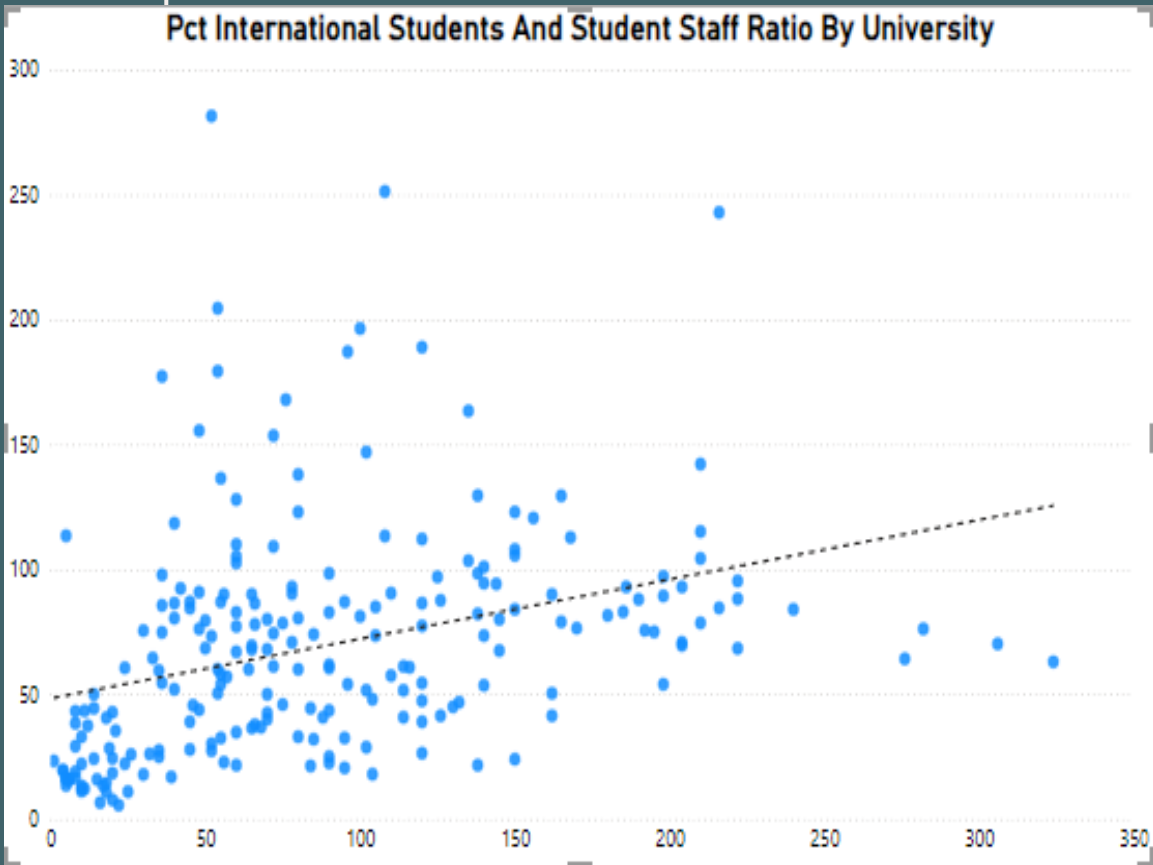
A higher university ranking often attracts more international students, as top rankings are associated with better academic reputation, quality of education, and global recognition. Conversely, a lower ranking might reduce the appeal to prospective international students.



- Is there a relationship between a university's ranking score and the percentage of female students enrolled?

There is positive relationship between a university's ranking score and the percentage of female students enrolled. While gender diversity is valued, it does significantly impact overall ranking scores.

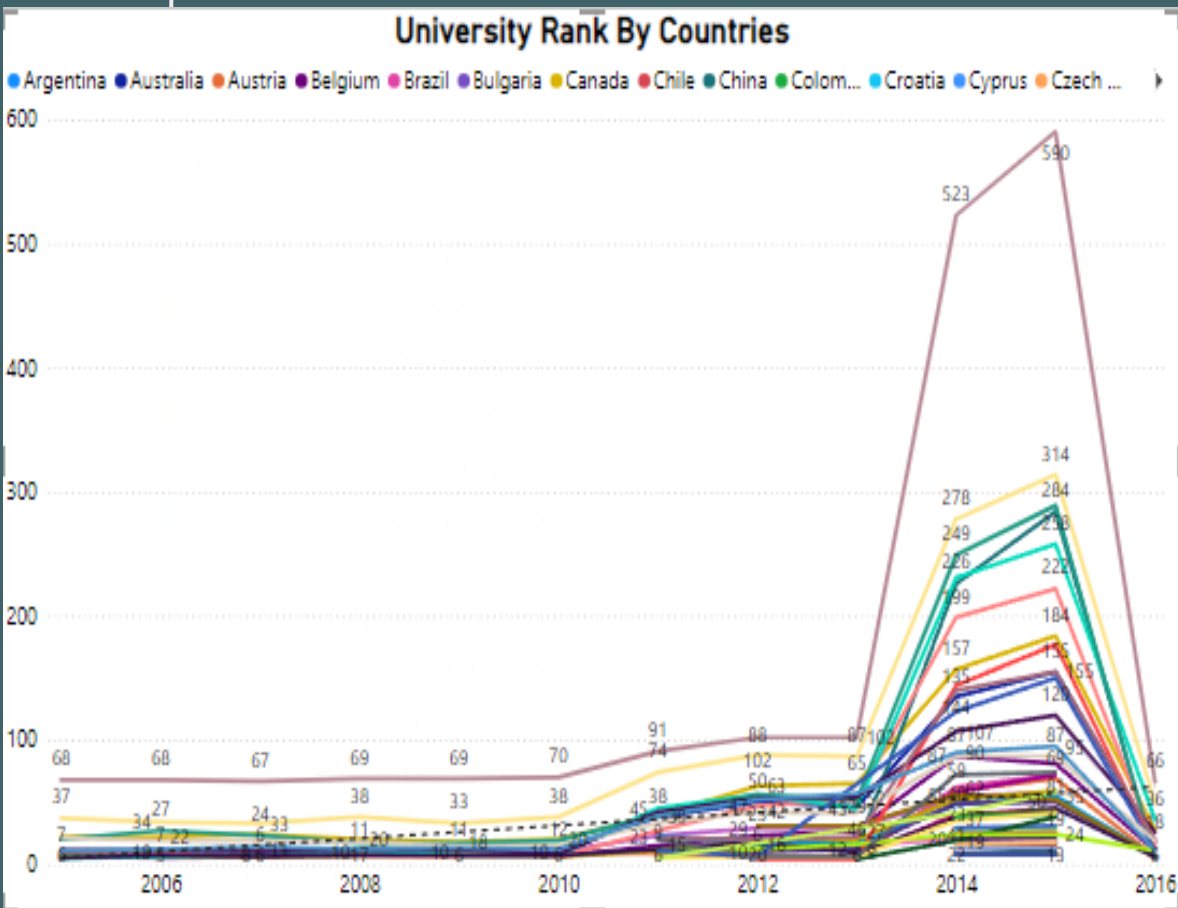
- How does the percentage of international students affect a university's student-staff ratio?



A higher percentage of international students can lead to a lower student-staff ratio if universities invest in additional staff to support diverse needs. However, without proportional staffing increases, it may strain resources and raise the ratio.

- Are there any significant trends or patterns in the rankings of universities from different countries?

Yes, significant trends in university rankings show that institutions from countries with strong research output and funding, like the U.S. and U.K., consistently rank higher.



EDA PROBLEM STATEMENTS

Introduction to University Rankings and Dataset Overview

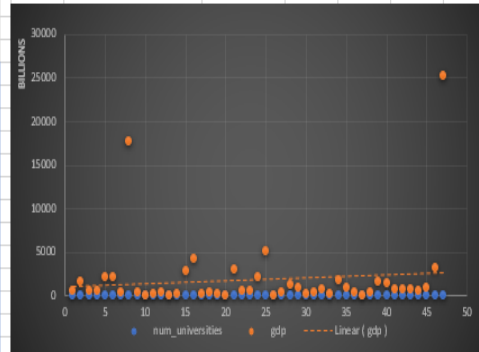
Is there a correlation between a country's GDP and the number of universities?

A Pearson correlation coefficient of approximately 0.871 suggests a strong positive correlation between a country's GDP and the number of universities. A coefficient close to 1 indicates that as one variable (GDP) increases, the other variable (number of universities) also tends to increase.

Is there a correlation between a country's GDP and the number of universities?

correlation_coef
0.871194651

country_name	num_ur	gdp
Argentina	1	\$ 6,41,00,00,000.00
Australia	19	\$ 16,40,00,00,000.00
Austria	9	\$ 5,44,00,00,000.00
Belgium	9	\$ 5,90,00,00,000.00
Brazil	7	\$ 21,90,00,00,000.00
Canada	25	\$ 21,90,00,00,000.00
Chile	2	\$ 3,40,00,00,000.00
China	37	\$ 1,77,00,00,00,000.00
Colombia	1	\$ 3,35,00,00,000.00
Croatia	1	\$ 73,80,00,00,000.00
Czech Republic	1	\$ 3,10,00,00,000.00
Denmark	5	\$ 3,99,00,00,000.00
Estonia	1	\$ 42,10,00,00,000.00
Finland	9	\$ 2,97,00,00,000.00
France	33	\$ 29,00,00,00,000.00
Germany	46	\$ 42,20,00,00,000.00
Greece	6	\$ 2,16,00,00,000.00
Hong Kong	6	\$ 3,67,00,00,000.00
Hungary	4	\$ 1,80,00,00,000.00
Iceland	1	\$ 27,00,00,000.00
India	11	\$ 31,00,00,00,000.00
Ireland	5	\$ 6,61,00,00,000.00
Israel	7	\$ 5,22,00,00,000.00
Italy	38	\$ 21,00,00,00,000.00
Japan	47	\$ 51,00,00,00,000.00
Lebanon	1	\$ 24,00,00,000.00
Malaysia	2	\$ 3,73,00,00,000.00
Mexico	1	\$ 13,00,00,00,000.00
Netherlands	13	\$ 10,00,00,00,000.00
New Zealand	5	\$ 2,51,00,00,000.00
Norway	4	\$ 4,82,00,00,000.00

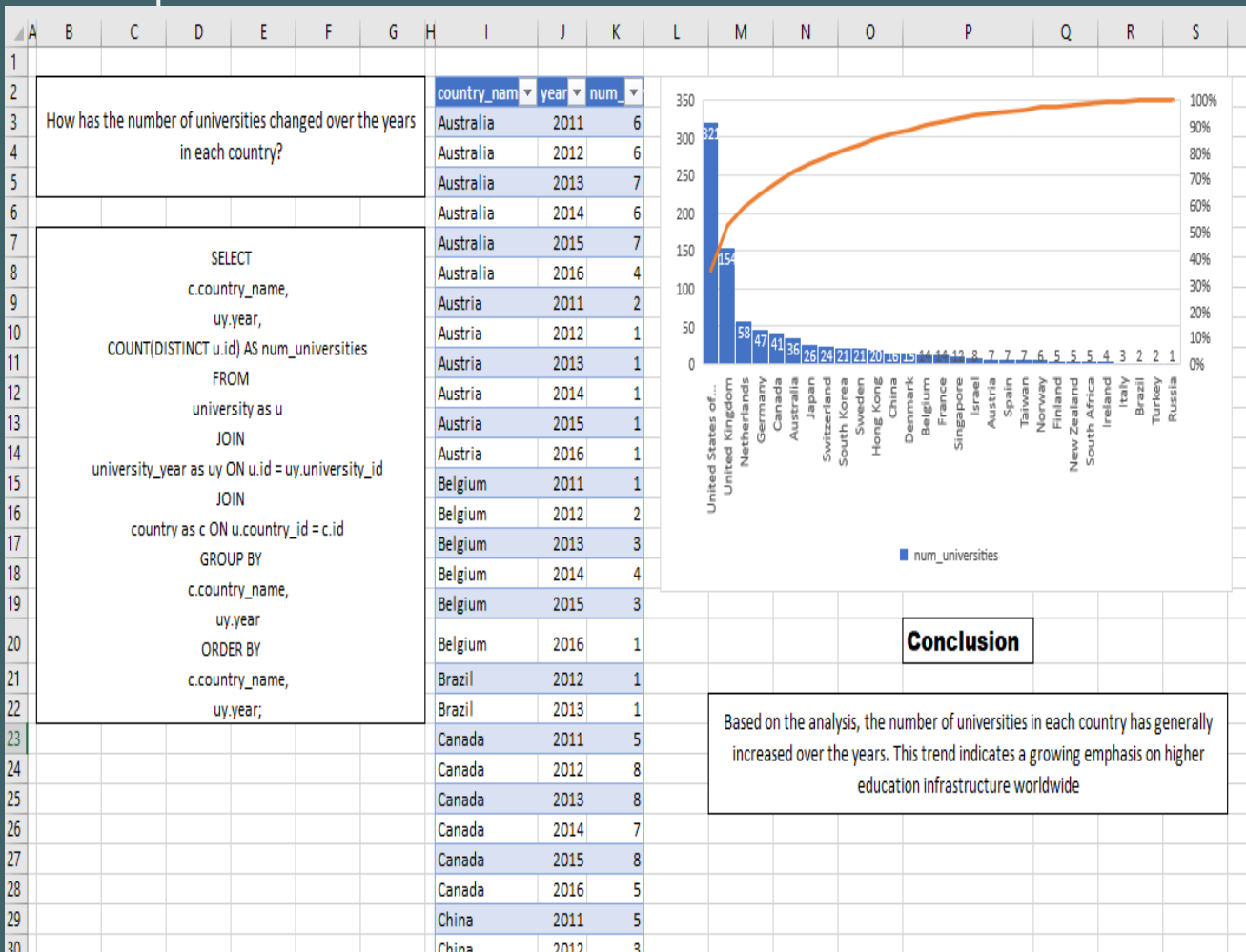


conclusion

A Pearson correlation coefficient of approximately 0.871 suggests a strong positive correlation between a country's GDP and the number of universities. A coefficient close to 1 indicates that as one variable (GDP) increases, the other variable (number of universities) also tends to increase.

How has the number of universities changed over the years in each country?

Based on the analysis, the number of universities in each country has generally increased over the years. This trend indicates a growing emphasis on higher education infrastructure worldwide



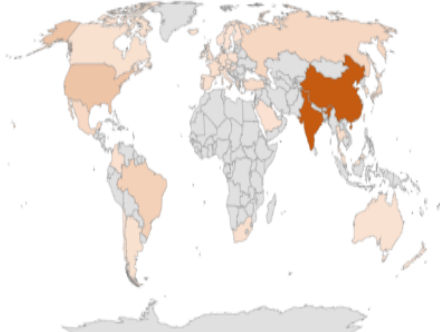
Is there a relationship between a country's population and the number of universities?

The correlation coefficient of 0.672 indicates a moderate positive correlation between a country's population and the number of universities. This suggests that countries with larger populations tend to have more universities, although the relationship is not extremely strong.

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1																	
2																	
3		Is there a relationship between a country's population and the number of universities?						country_name	population	num_universities			correlation_coefficient				
4								United States of America	338289857	203			0.213704925				
5								United Kingdom	68746056	55							
6								Japan	123420815	47							
7		SELECT						Germany	84319450	46							
8		(COUNT(*) * SUM(population * num_universities) -						Italy	60431283	38							
9		SUM(population) * SUM(num_universities)) /						China	1428267365	37							
10		(SQRT(COUNT(*) * SUM(POW(population, 2)) -						France	65722066	33							
11		POW(SUM(population), 2)) *						Canada	40083932	25							
12		SQRT(COUNT(*) * SUM(POW(num_universities, 2)) -						South Korea	51854971	24							
13		POW(SUM(num_universities), 2))) AS						Spain	47570610	24							
14		correlation_coefficient						Australia	26100000	19							
15		FROM (Netherlands	18010264	13							
16		SELECT						Sweden	10716327	11							
17		c.country_name,						India	1428627663	11							
18		c.population,						Taiwan	24018334	9							
19		COUNT(u.id) AS num_universities						Finland	5542717	9							
20		FROM						Belgium	11757212	9							
21		university u						Austria	9027999	9							
22		JOIN						Switzerland	8944037	8							
23		country c ON u.country_id = c.id						Israel	9738749	7							
24		GROUP BY						Brazil	216992646	7							
25		c.country_name, c.population						Hong Kong	7622987	6							
26) AS subquery;						Portugal	10113373	6							
27								Greece	10321226	6							
28								Denmark	5934253	5							
29								Ireland	5050985	5							
30								South Africa	61754524	5							
31								New Zealand	5233742	5							
32								Norway	5533562	4							
33								Hungary	9615633	4							
34								Poland	37914275	4							
35								Turkey	87685366	3							

population

392824 1428627663



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Powered by Bing

conclusion

The correlation coefficient of 0.672 indicates a moderate positive correlation between a country's population and the number of universities. This suggests that countries with larger populations tend to have more universities, although the relationship is not extremely strong.

Are there any common criteria used by different ranking systems?

The output will show which ranking criteria are commonly used across multiple ranking systems, indicating the criteria that are most valued and consistently assessed in university rankings.

Are there any common criteria used by different ranking systems?		criteria_name	ranking_system_count
<pre>SELECT rc.criteria_name, COUNT(DISTINCT rs.system_name) AS ranking_system_count FROM ranking_criteria as rc JOIN ranking_system as rs ON rc.ranking_system_id = rs.id GROUP BY rc.criteria_name ORDER BY ranking_system_count DESC, rc.criteria_name;</pre>		Alumni	1
		Alumni Employ	1
		Award	1
		Citations	1
		Citations Rank	1
		HiCi	1
		Income	1
		Influence Rank	1
		International	1
		N and S	1
		Patents Rank	1
		PCP	1
		Pub	1
		Publications Ran	1
		Quality of Educat	1
conclusion		Quality of Facult	1
		Research	1
		Teaching	1
		Total CWUR	1
		Total Shanghai	1
The output will show which ranking criteria are commonly used across multiple ranking systems, indicating the criteria that are most valued and consistently assessed in university rankings.		Total Times	1
		ranking_system_count	
		Total Times	
		Total OWUR	
		Research	
		Quality of Education Rank	
		Pub	
		Patents Rank	
		International	
		Income	
		Citations Rank	
		Award	
		Alumni	

What is the trend in university rankings over the years according to each system?

The output will provide insights into how universities' rankings have evolved over the years across different ranking systems.

What is the trend in university rankings over the years according to each system?

```
SELECT
  u.university_name,
  rs.system_name,
  ur.year,
  AVG(ur.score) AS avg_score
FROM
  university_ranking_year as ur
JOIN
  university as u ON ur.university_id = u.id
JOIN
  ranking_criteria as rc ON ur.ranking_criteria_id = rc.id
JOIN
  ranking_system as rs ON rc.ranking_system_id = rs.id
GROUP BY
  u.university_name, rs.system_name, ur.year
ORDER BY
  u.university_name, rs.system_name, ur.year;
```

university_name	system_name	year	avg_score
Aalborg University	Center for World University Rankings	2014	377.75
Aalborg University	Center for World University Rankings	2015	376.63
Aalto University	Center for World University Rankings	2014	298.38
Aalto University	Center for World University Rankings	2015	310.50
Aarhus University	Center for World University Rankings	2014	135.00
Aarhus University	Center for World University Rankings	2015	132.25
Aarhus University	Shanghai Ranking	2008	23.29
Aarhus University	Shanghai Ranking	2009	23.14
Aarhus University	Shanghai Ranking	2010	22.86
Aarhus University	Shanghai Ranking	2011	24.00
Aarhus University	Shanghai Ranking	2012	24.29
Aarhus University	Shanghai Ranking	2013	24.57
Aarhus University	Shanghai Ranking	2014	26.00
Aarhus University	Shanghai Ranking	2015	26.00
Aarhus University	Times Higher Education World University Ranking	2011	49.33
Aarhus University	Times Higher Education World University Ranking	2012	55.00
Aarhus University	Times Higher Education World University Ranking	2013	59.00
Aarhus University	Times Higher Education World University Ranking	2014	54.67
Aarhus University	Times Higher Education World University Ranking	2015	53.50
Aarhus University	Center for World University Rankings	2014	477.75
Aarhus University	Center for World University Rankings	2015	502.50
Aarhus University	Center for World University Rankings	2014	498.38
Aarhus University	Center for World University Rankings	2015	526.75
Aarhus University	Center for World University Rankings	2012	74.25
Aarhus University	Center for World University Rankings	2013	77.25
Aarhus University	Center for World University Rankings	2014	294.13
Aarhus University	Center for World University Rankings	2015	334.38
Aarhus University	Shanghai Ranking	2005	25.71
Aarhus University	Shanghai Ranking	2006	24.71
Aarhus University	Shanghai Ranking	2007	26.86
Aarhus University	Shanghai Ranking	2008	31.00

Count of university_name by system_name

Times Higher Education World University Ranking

279

Shanghai Ranking

206

Center for World University Rankings

515

conclusion

The output will provide insights into how universities' rankings have evolved over the years across different ranking systems.

How does the choice of ranking system affect a university's international student enrollment?

The output of the query indicates that the "Times Higher Education World University Ranking" system has an average percentage of international students of approximately 19.97%.

This suggests that universities ranked by this system tend to have a higher proportion of international students.

How does the choice of ranking system affect a university's international student enrollment?

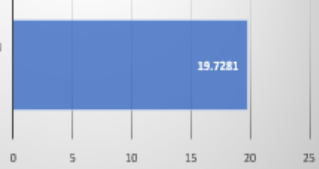
```
WITH combined_data AS (  
  SELECT  
    uy.university_id,  
    uy.year,  
    uy.pot_international_students,  
    ury.ranking_criteria_id,  
    ury.score,  
    rc.ranking_system_id,  
    rs.system_name  
  FROM  
    university_year as uy  
  JOIN  
    university_ranking_year as ury ON uy.university_id =  
    ury.university_id AND uy.year = ury.year  
  JOIN  
    ranking_criteria as rc ON ury.ranking_criteria_id = rc.id  
  JOIN  
    ranking_system as rs ON rc.ranking_system_id = rs.id  
  WHERE  
    rc.criteria_name = 'International'  
)  
  
SELECT  
  system_name AS Ranking_System,  
  AVG(pot_international_students) AS  
  Avg_International_Student_Percentage  
FROM  
  combined_data  
GROUP BY  
  system_name  
ORDER BY  
  Avg_International_Student_Percentage DESC;
```

Ranking_System
Times Higher Education World University Ranking

Avg_International_Student_Percentage
19.7281

Avg_International_Student_Percentage

TIMES HIGHER EDUCATION
WORLD UNIVERSITY
RANKING



Times Higher Education World University Ranking

Avg_International_Student_Percentage

conclusion

The output of the query indicates that the "Times Higher Education World University Ranking" system has an average percentage of international students of approximately 19.97%.

This suggests that universities ranked by this system tend to have a higher proportion of international students.

Are there any criteria that have different weights in different ranking systems?

The results will show which ranking criteria have different scores assigned by different ranking systems. This information is crucial for universities to understand how their performance in different criteria is evaluated differently by each ranking system.

1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	Are there any criteria that have different weights in different ranking systems?								# criteria	system_name	weight	<div>conclusion</div> <p>The results will show which ranking criteria have different scores assigned by different ranking systems. This information is crucial for universities to understand how their performance in different criteria is evaluated differently by each ranking system.</p>							
3									Alumni	Shanghai Ranking	18								
4									Alumni	Shanghai Ranking	0								
5									Alumni	Shanghai Ranking	15								
6									Alumni	Shanghai Ranking	5								
7	<pre>WITH criteria_weights AS (SELECT rc.criteria_name, rs.system_name, ur.score AS weight FROM university_ranking_year ur JOIN ranking_criteria rc ON ur.ranking_criteria_id = rc.id JOIN ranking_system rs ON rc.ranking_system_id = rs.id) SELECT criteria_name, system_name, weight FROM criteria_weights WHERE criteria_name IN (SELECT criteria_name FROM criteria_weights GROUP BY criteria_name HAVING COUNT(DISTINCT weight) > 1) ORDER BY criteria_name, system_name;</pre>								Alumni	Shanghai Ranking	21								
8									Alumni	Shanghai Ranking	23								
9									Alumni	Shanghai Ranking	0								
10									Alumni	Shanghai Ranking	27								
11									Alumni	Shanghai Ranking	28								
12									Alumni	Shanghai Ranking	32								
13									Alumni	Shanghai Ranking	18								
14									Alumni	Shanghai Ranking	33								
15									Alumni	Shanghai Ranking	7								
16									Alumni	Shanghai Ranking	13								
17									Alumni	Shanghai Ranking	5								
18									Alumni	Shanghai Ranking	49								
19									Alumni	Shanghai Ranking	12								
20									Alumni	Shanghai Ranking	12								
21									Alumni	Shanghai Ranking	14								
22									Alumni	Shanghai Ranking	0								
23									Alumni	Shanghai Ranking	29								
24									Alumni	Shanghai Ranking	24								
25									Alumni	Shanghai Ranking	13								
26									Alumni	Shanghai Ranking	18								
27									Alumni	Shanghai Ranking	17								
28									Alumni	Shanghai Ranking	16								
29									Alumni	Shanghai Ranking	9								
30									Alumni	Shanghai Ranking	19								
31									Alumni	Shanghai Ranking	25								
32									Alumni	Shanghai Ranking	0								
33									Alumni	Shanghai Ranking	14								
34									Alumni	Shanghai Ranking	0								
35									Alumni	Shanghai Ranking	0								
36									Alumni	Shanghai Ranking	0								
37									Alumni	Shanghai Ranking	0								
38									Alumni	Shanghai Ranking	13								
39									Alumni	Shanghai Ranking	15								
40									Alumni	Shanghai Ranking	0								
41									Alumni	Shanghai Ranking	9								
42									Alumni	Shanghai Ranking	100								
43									Alumni	Shanghai Ranking	100								
44	Alumni	Shanghai Ranking	41																
45	Alumni	Shanghai Ranking	72																

How have the weights of ranking criteria changed over time?

The results will show trends and shifts in the importance of different criteria within each ranking system over the years. This helps in understanding how the focus of various ranking systems may have evolved, indicating shifts in what these systems consider important for university rankings.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
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How have the weights of ranking criteria changed over time?

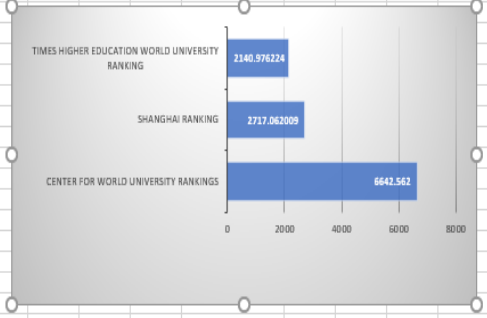
```
WITH criteria_weights_over_time AS (
    SELECT
        rc.criteria_name,
        rs.system_name,
        ur.year,
        ur.score AS weight
    FROM
        university_ranking_year as ur
    JOIN
        ranking_criteria as rc ON ur.ranking_criteria_id = rc.id
    JOIN
        ranking_system as rs ON rc.ranking_system_id = rs.id
)

SELECT
    criteria_name,
    system_name,
    year,
    AVG(weight) AS avg_weight
FROM
    criteria_weights_over_time
GROUP BY
    criteria_name, system_name, year
ORDER BY
    criteria_name, system_name, year;
```

criteria	system_name	year	avg_weight
Alumni	Shanghai Ranking	2005	28.6901408
Alumni	Shanghai Ranking	2006	27.3661972
Alumni	Shanghai Ranking	2007	27.0273973
Alumni	Shanghai Ranking	2008	26.0833333
Alumni	Shanghai Ranking	2009	25.3802817
Alumni	Shanghai Ranking	2010	25.5138889
Alumni	Shanghai Ranking	2011	25.9577485
Alumni	Shanghai Ranking	2012	24.4507042
Alumni	Shanghai Ranking	2013	24.0285714
Alumni	Shanghai Ranking	2014	22.5142857
Alumni	Shanghai Ranking	2015	22.7567568
Alumni Empl	Center for World Univer	2012	75.39
Alumni Empl	Center for World Univer	2013	75.31
Alumni Empl	Center for World Univer	2014	363.391
Alumni Empl	Center for World Univer	2015	406.536
Award	Shanghai Ranking	2005	26.8163014
Award	Shanghai Ranking	2006	26.3661972
Award	Shanghai Ranking	2007	26.7671233
Award	Shanghai Ranking	2008	27.4305556
Award	Shanghai Ranking	2009	27.7887324
Award	Shanghai Ranking	2010	27.9166667
Award	Shanghai Ranking	2011	28.4366197
Award	Shanghai Ranking	2012	28.8028169
Award	Shanghai Ranking	2013	28.9714286
Award	Shanghai Ranking	2014	28.2571429
Award	Shanghai Ranking	2015	29.1851852
Citations	Times Higher Educatio	2011	71.6324324
Citations	Times Higher Educatio	2012	74.7040816
Citations	Times Higher Educatio	2013	76.6446701
Citations	Times Higher Educatio	2014	77.4494949
Citations	Times Higher Educatio	2015	78.6130653
Citations	Times Higher Educatio	2016	85.3272727
Citations Ra	Center for World Univer	2012	54.42
Citations Ra	Center for World Univer	2013	53.93
Citations Ra	Center for World Univer	2014	447.349
Citations Ra	Center for World Univer	2015	451.334

conclusion

The results will show trends and shifts in the importance of different criteria within each ranking system over the years. This helps in understanding how the focus of various ranking systems may have evolved, indicating shifts in what these systems consider important for university rankings.



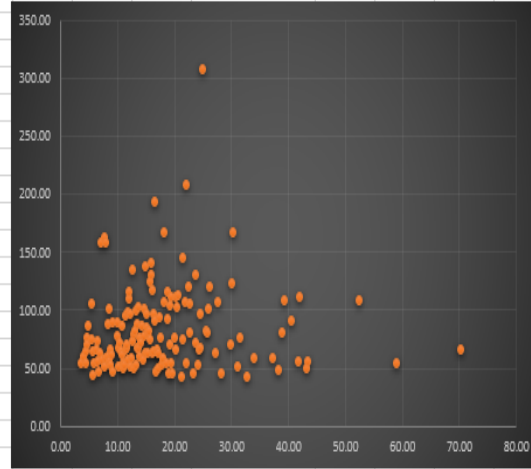
Is there a relationship between a university's score and the student-staff ratio?

The results will show how the average score varies with different student-staff ratios. This can indicate whether there is a significant relationship between a university's performance score and the ratio of students to staff

Is there a relationship between a university's score and the student-staff ratio?

```
WITH combined_data AS (  
  SELECT  
    uy.university_id,  
    uy.year,  
    uy.student_staff_ratio,  
    ury.score  
  FROM  
    university_year uy  
  JOIN  
    university_ranking_year ury ON uy.university_id =  
    ury.university_id AND uy.year = ury.year  
)  
  
SELECT  
  student_staff_ratio,  
  AVG(score) AS avg_score  
FROM  
  combined_data  
GROUP BY  
  student_staff_ratio  
ORDER BY  
  student_staff_ratio;
```

student_staff_ratio	avg_score
3.60	53.05
4.10	59.87
4.40	53.87
4.50	63.54
4.60	75.97
4.80	69.16
5.00	86.15
5.50	104.54
5.60	74.65
5.70	64.48
5.80	43.58
5.90	53.37
6.40	65.08
6.50	54.53
6.60	72.20
6.80	46.37
6.90	63.16
7.10	157.88
7.30	56.40
7.70	162.71
7.80	50.91
7.90	57.57
8.00	158.04
8.30	88.17
8.40	59.94
8.50	101.37
8.60	54.87
8.70	51.60
8.90	65.91
9.00	60.67
9.20	88.74

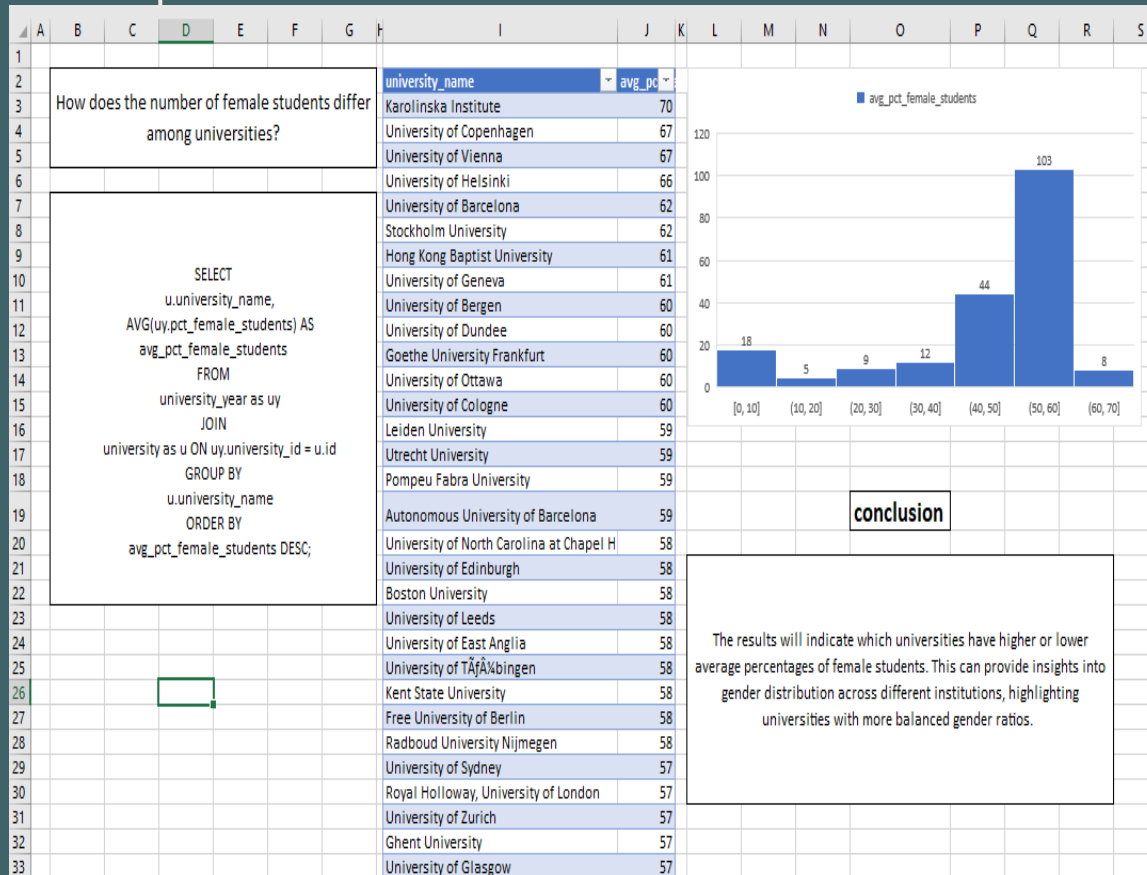


conclusion

The results will show how the average score varies with different student-staff ratios. This can indicate whether there is a significant relationship between a university's performance score and the ratio of students to staff

How does the number of female students differ among universities?

The results will indicate which universities have higher or lower average percentages of female students. This can provide insights into gender distribution across different institutions, highlighting universities with more balanced gender ratios.



What is the distribution of universities across different countries?

Using the query, we successfully analyzed the distribution of universities across different countries. This analysis provides us valuable insights into where higher education institutions are concentrated worldwide, helping stakeholders make informed decisions.

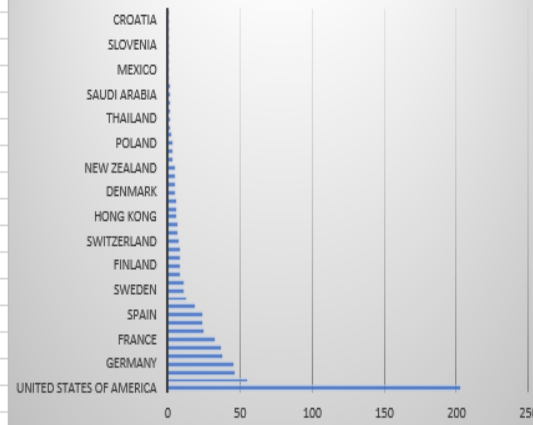
What is the distribution of universities across different countries?

```
SELECT
  c.country_name,
  COUNT(u.id) AS num_universities
FROM
  university as u
JOIN
  country as c ON u.country_id = c.id
GROUP BY
  c.country_name
ORDER BY
  num_universities DESC;
```

country_name	num_universities
--------------	------------------

United States of America	203
United Kingdom	55
Japan	47
Germany	46
Italy	38
China	37
France	33
Canada	25
South Korea	24
Spain	24
Australia	19
Netherlands	13
Sweden	11
India	11
Taiwan	9
Finland	9
Belgium	9
Austria	9
Switzerland	8
Israel	7
Brazil	7
Hong Kong	6
Portugal	6
Greece	6
Denmark	5
Ireland	5
South Africa	5
New Zealand	5
Norway	4
Hungary	4
Poland	4

num_universities



conclusion

Using the query, we successfully analyzed the distribution of universities across different countries. This analysis provides us valuable insights into where higher education institutions are concentrated worldwide, helping stakeholders make informed decisions.

How has the ranking of universities changed over the years?

The output shows how the performance of each university has evolved over time based on the scores. For example if a university's score increases over the years, it suggests an improvement in its ranking position.

How has the ranking of universities changed over the years?

```
SELECT
u.university_name,
ury.year,
ury.score
FROM
university_ranking_year as ury
JOIN
university as u ON ury.university_id = u.id
ORDER BY
u.university_name, ury.year;
```

university_name	year	score
-----------------	------	-------

Aalborg University	2014	45
--------------------	------	----

Aalborg University	2014	426
--------------------	------	-----

Aalborg University	2014	210
--------------------	------	-----

Aalborg University	2014	363
--------------------	------	-----

Aalborg University	2014	633
--------------------	------	-----

Aalborg University	2014	606
--------------------	------	-----

Aalborg University	2014	384
--------------------	------	-----

Aalborg University	2014	355
--------------------	------	-----

Aalborg University	2015	660
--------------------	------	-----

Aalborg University	2015	45
--------------------	------	----

Aalborg University	2015	218
--------------------	------	-----

Aalborg University	2015	439
--------------------	------	-----

Aalborg University	2015	287
--------------------	------	-----

Aalborg University	2015	401
--------------------	------	-----

Aalborg University	2015	367
--------------------	------	-----

Aalborg University	2015	596
--------------------	------	-----

Aalto University	2014	344
------------------	------	-----

Aalto University	2014	434
------------------	------	-----

Aalto University	2014	210
------------------	------	-----

Aalto University	2014	355
------------------	------	-----

Aalto University	2014	46
------------------	------	----

Aalto University	2014	609
------------------	------	-----

Aalto University	2014	251
------------------	------	-----

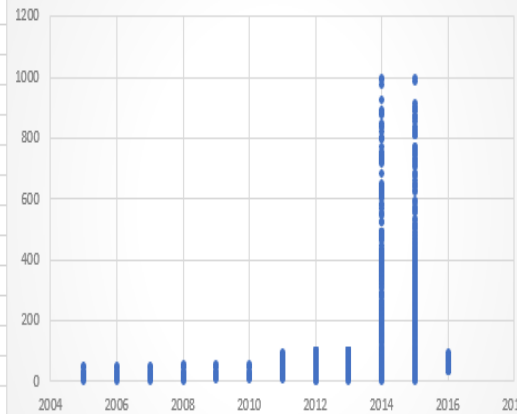
Aalto University	2014	138
------------------	------	-----

Aalto University	2015	645
------------------	------	-----

Aalto University	2015	246
------------------	------	-----

Aalto University	2015	45
------------------	------	----

Aalto University	2015	336
------------------	------	-----

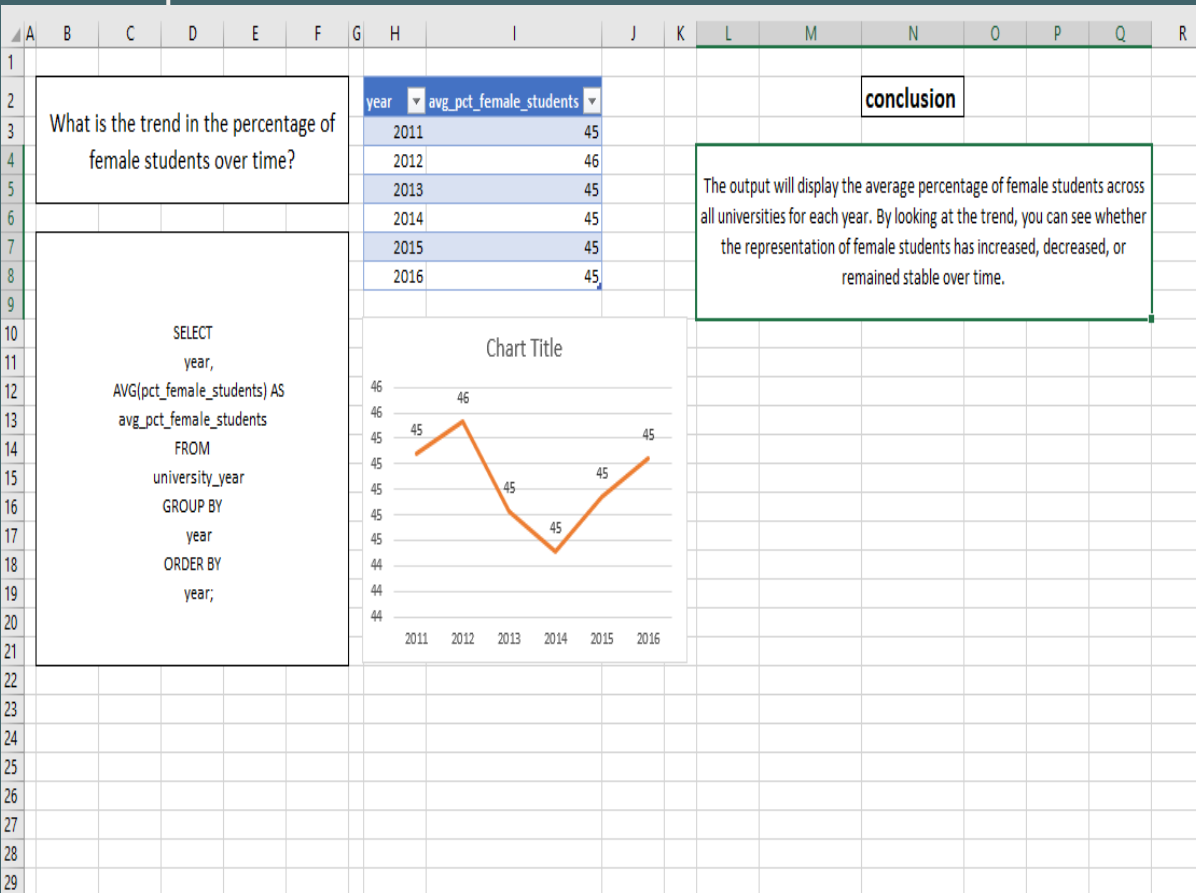


conclusion

The output shows how the performance of each university has evolved over time based on the scores. For example if a university's score increases over the years, it suggests an improvement in its ranking position.

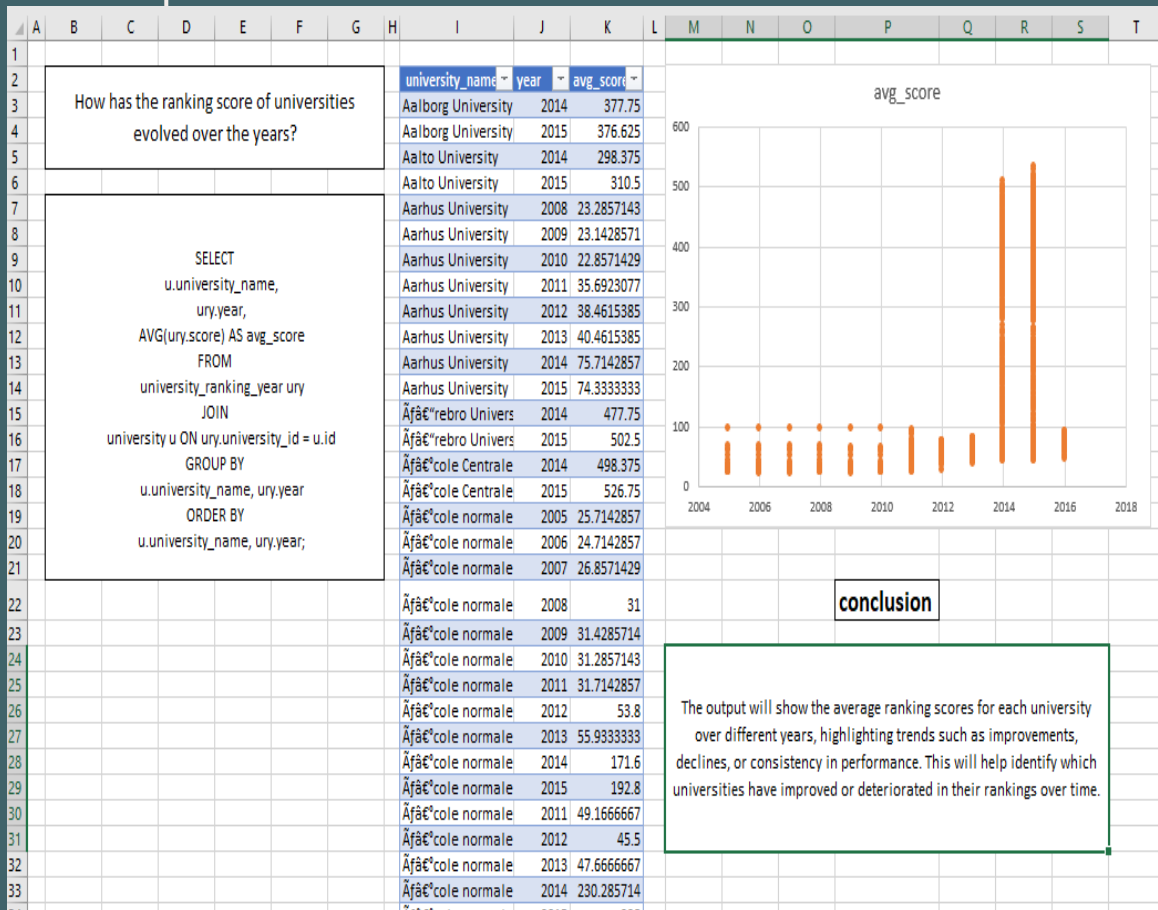
What is the trend in the percentage of female students over time?

The output will display the average percentage of female students across all universities for each year. By looking at the trend, you can see whether the representation of female students has increased, decreased, or remained stable over time.



How has the ranking score of universities evolved over the years?

The output will show the average ranking scores for each university over different years, highlighting trends such as improvements, declines, or consistency in performance. This will help identify which universities have improved or deteriorated in their rankings over time.



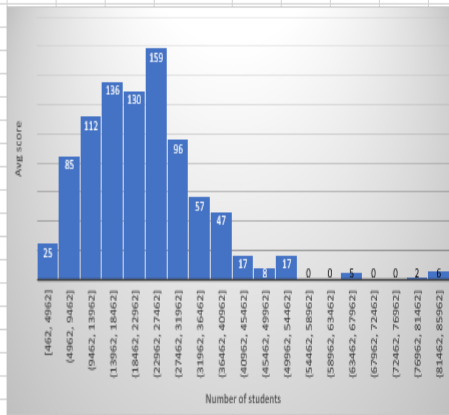
Is there a relationship between a university's ranking score and the number of students over time?

The output will show how a university's ranking score correlates with its student population over time. By analyzing this data, you can determine if there's a pattern, such as whether larger universities tend to have higher or lower scores, or if changes in student numbers influence ranking performance.

Is there a relationship between a university's ranking score and the number of students over time?

```
SELECT
u.university_name,
uy.year,
uy.num_students,
AVG(lury.score) AS avg_score
FROM
university_year as uy
JOIN
university_ranking_year as lury ON uy.university_id =
lury.university_id AND uy.year = lury.year
GROUP BY
u.university_name, uy.year, uy.num_students
ORDER BY
u.university_name, uy.year;
```

university_name	year	num_students	avg_score
Aarhus University	2011	23895	35.69
Aarhus University	2012	23895	38.46
Aarhus University	2013	23895	40.46
Aarhus University	2014	23895	75.71
Aarhus University	2015	23895	74.33
Aarhus*cole normale s	2011	2218	49.17
Aarhus*cole normale s	2012	2218	45.50
Aarhus*cole normale s	2013	2218	47.67
Aarhus*cole normale s	2014	2218	230.29
Aarhus*cole normale s	2015	2218	228.00
Aarhus*cole Polytechn	2011	2429	70.60
Aarhus*cole Polytechn	2012	2429	70.86
Aarhus*cole Polytechn	2013	2429	76.57
Aarhus*cole Polytechn	2014	2429	131.93
Aarhus*cole Polytechn	2015	2429	131.21
Arizona State Univer	2011	83236	45.60
Arizona State Univer	2012	83236	64.86
Arizona State Univer	2013	83236	64.79
Arizona State Univer	2014	83236	80.81
Arizona State Univer	2015	83236	79.76
Arizona State Univer	2016	83236	44.83
Australian National	2011	14604	71.20
Australian National	2012	14604	69.67
Australian National	2013	14604	80.36
Australian National	2014	14604	135.14
Australian National	2015	14604	136.29
Australian National	2016	14604	69.17
Autonomous Univer	2016	30538	50.50
Birkbeck, University	2011	9454	52.33
Birkbeck, University	2012	9454	48.33
Birkbeck, University	2013	9454	48.17
Boston College	2011	13216	46.80
Boston College	2012	13216	39.33
Boston College	2013	13216	52.00



conclusion

The output will show how a university's ranking score correlates with its student population over time. By analyzing this data, you can determine if there's a pattern, such as whether larger universities tend to have higher or lower scores, or if changes in student numbers influence ranking performance.

Final tips & takeaways

- **Identify Key Trends:** Focus on uncovering significant patterns in university rankings across different systems.
- **Analyze Ranking Criteria:** Assess how criteria like research output and teaching quality influence university positions.
- **Thorough Data Aggregation:** Ensure your data is well-organized and comprehensive for effective exploratory data analysis (EDA).
- **Track Metric Changes:** Highlight changes in important metrics such as student-staff ratios and international student enrollment over time.
- **Actionable Insights:** Aim to provide practical insights that reveal the factors contributing to university success in global rankings.

Thank you

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