**CAPSTONE PROJECT**

**University Success Analysis**

**– Rayavarapu Leela prasanna**

The PROCESS

* ***Data Retrieval from GitHub:***

Acquired the necessary dataset from a designated GitHub repository, containing essential information about University Success Analysis. The dataset contained diverse countries and their universities with performance-based ranking.

* ***Data Refinement and Enrichment:***

The procedures were done to ensure data quality and coherence. Furthermore, considered enhancing the dataset by introducing new problem scenarios that can amplify the depth of analysis.

* ***Integration with Analytical Tools:***

Established connections between the dataset and various analytical tools. Linked the dataset with tools such as Power BI, Excel, and MySQL Workbench, to begin the process of data integration and processing.

* **Problem-Solving through Power BI:**

Utilized Power BI to address specific problem statements related to the University Success Analysis. Utilized its robust functionalities for visualizing, exploring, and analysing data, effectively unearthing insights and solutions.

* ***Exploratory Data Analysis (EDA):***

Conducted exploratory data analysis using either Excel or SQL Workbench, based on the complexity of the analysis. Extracted meaningful patterns, correlations, and trends from the project data to guide subsequent decision-making.

* ***Compelling and Informative Presentation Creation:***

Developed an all-encompassing PowerPoint presentation that encapsulates the project's aims, methodologies, solutions to problem statements, and pivotal visualizations. Each problem statement is accompanied by a dedicated section containing relevant conclusions and insights.

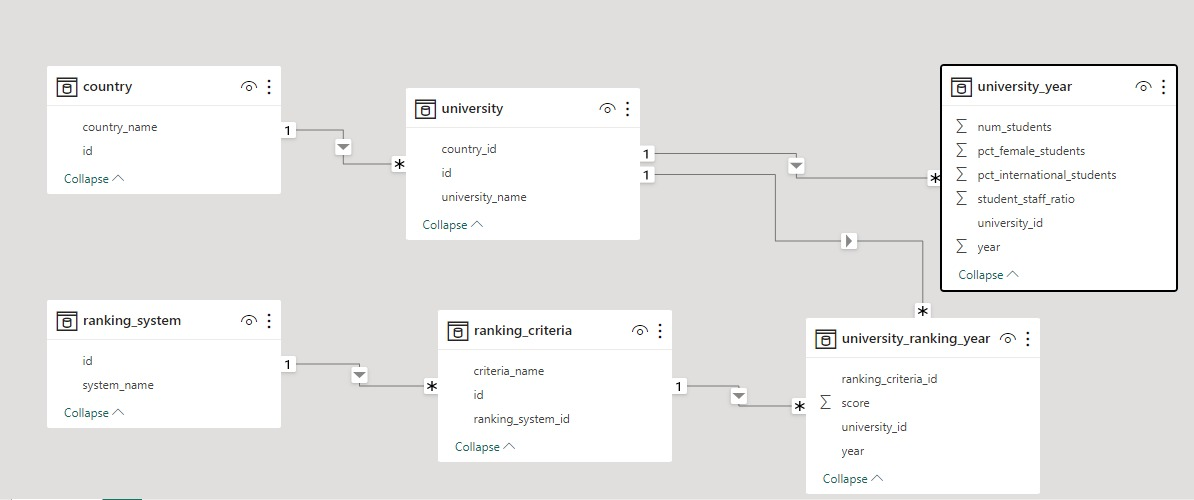
* ***Comprehensive Documentation:***

Compiled a detailed report that meticulously outlines the entire project lifecycle. This documentation encompasses facets such as data acquisition, refinement, formulation of problem statements, integration of analytical tools, Power BI solutions, insights derived from exploratory data analysis, and the visualizations featured in the PowerPoint presentation.

**Data Dictionary**

* **id (Primary Key):** Unique identifier for records in various tables.
* **country\_name:** Name of the country where the university is located.
* **ranking\_system\_id:** Identifier for the ranking system used for university rankings.
* **criteria\_name:** Name of the criteria used for ranking universities.
* **system\_name:** Name of the ranking system.
* **country\_id (Foreign Key):** Identifier linking universities to their respective countries.
* **university\_name:** Name of the university.
* **university\_id (Primary Key):** Unique identifier for universities.
* **ranking\_criteria\_id (Primary Key):** Unique identifier for ranking criteria.
* **year:** The year for which the ranking or performance data is reported.
* **score:** The score assigned to the university based on ranking criteria.
* **num\_students:** Number of students enrolled in the university.
* **student\_staff\_ratio:** Ratio of students to staff members in the university.
* **pct\_international\_students:** Number of international students in the university.
* **pct\_female\_students:** Number of female students in the university.

data model in excel



***EDA PROBLEM STATEMENT***

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

**Correlation – 0.907**

**Conclusion –** GDP is directly proportional to the Total Universities, as the graph itself showing that there is a positive correlation between countries GDP and Number of Universities. The higher GDP, the higher number of universities.

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

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Column Labels |  |  |  |  |  |  |  |  |  |  |
| Row Labels | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| Argentina |  |  |  |  |  |  |  |  |  | 32 | 24 |
| Australia | 7 | 7 | 7 | 14 | 14 | 14 | 63 | 79 | 85 | 265 | 271 |
| Austria | 7 |  |  |  |  |  | 12 | 6 | 6 | 102 | 102 |
| Belgium |  |  |  |  |  | 7 | 19 | 25 | 31 | 124 | 118 |
| Brazil |  |  |  |  |  |  |  | 6 | 6 | 144 | 144 |
| Bulgaria |  |  |  |  |  |  |  |  |  | 8 | 8 |
| Canada | 28 | 28 | 28 | 28 | 28 | 28 | 58 | 106 | 108 | 326 | 340 |
| Chile |  |  |  |  |  |  |  |  |  | 32 | 32 |
| China |  |  |  |  |  |  | 30 | 18 | 12 | 684 | 682 |
| Colombia |  |  |  |  |  |  |  |  |  | 16 | 16 |
| Croatia |  |  |  |  |  |  |  |  |  | 8 | 8 |
| Cyprus |  |  |  |  |  |  |  |  |  | 8 | 8 |
| Czech Republic |  |  |  |  |  |  |  |  |  | 40 | 40 |
| Denmark | 7 | 7 | 7 | 14 | 14 | 14 | 32 | 40 | 40 | 72 | 72 |
| Egypt |  |  |  |  |  |  | 6 |  |  | 32 | 32 |
| Estonia |  |  |  |  |  |  |  |  |  | 8 | 8 |
| Finland | 7 | 7 | 7 | 7 | 7 | 7 | 13 | 21 | 21 | 85 | 85 |
| France | 14 | 14 | 14 | 7 | 7 | 7 | 31 | 77 | 96 | 462 | 448 |
| Germany | 7 | 7 | 14 | 14 | 7 | 7 | 85 | 103 | 82 | 514 | 526 |
| Greece |  |  |  |  |  |  |  |  |  | 56 | 56 |
| Hong Kong |  |  |  |  |  |  | 24 | 24 | 24 | 66 | 72 |
| Hungary |  |  |  |  |  |  |  |  |  | 48 | 48 |
| Iceland |  |  |  |  |  |  |  |  |  | 8 | 8 |
| India |  |  |  |  |  |  |  |  |  | 120 | 128 |
| Iran |  |  |  |  |  |  |  |  |  | 64 | 64 |
| Ireland |  |  |  |  |  |  | 12 | 12 | 12 | 76 | 70 |
| Israel |  |  |  |  |  |  |  | 51 | 57 | 68 | 62 |
| Italy |  |  |  |  |  |  |  | 8 | 8 | 376 | 382 |
| Japan | 28 | 35 | 35 | 21 | 28 | 28 | 58 | 91 | 92 | 636 | 643 |
| Lebanon |  |  |  |  |  |  |  |  |  | 8 | 8 |
| Lithuania |  |  |  |  |  |  |  |  |  | 8 | 8 |
| Malaysia |  |  |  |  |  |  |  |  |  | 24 | 24 |
| Mexico |  |  |  |  |  |  |  |  |  | 16 | 16 |
| Netherlands | 14 | 14 | 14 | 14 | 14 | 14 | 74 | 102 | 101 | 204 | 198 |
| New Zealand |  |  |  |  |  |  | 6 | 6 | 6 | 54 | 54 |
| Norway | 7 | 7 | 7 | 7 | 7 | 7 | 13 | 27 | 15 | 53 | 53 |
| Poland |  |  |  |  |  |  |  |  |  | 72 | 72 |
| Portugal |  |  |  |  |  |  |  |  |  | 56 | 56 |
| Puerto Rico |  |  |  |  |  |  |  |  |  | 8 | 8 |
| Romania |  |  |  |  |  |  |  |  |  | 8 | 16 |
| Russia |  |  |  |  |  |  |  |  | 8 | 24 | 46 |
| Saudi Arabia |  |  |  |  |  |  |  |  |  | 32 | 32 |
| Serbia |  |  |  |  |  |  |  |  |  | 8 | 8 |
| Singapore |  |  |  |  |  |  | 12 | 12 | 20 | 28 | 28 |
| Slovakia |  |  |  |  |  |  |  |  |  | 8 | 8 |
| Slovenia |  |  |  |  |  |  |  |  |  | 16 | 16 |
| South Africa |  |  |  |  |  |  | 6 | 6 | 6 | 46 | 46 |
| South Korea |  |  |  |  |  |  | 24 | 26 | 32 | 296 | 312 |
| Spain |  |  |  |  |  |  | 12 | 6 |  | 334 | 326 |
| Sweden | 28 | 28 | 28 | 28 | 21 | 21 | 39 | 59 | 59 | 139 | 139 |
| Switzerland | 14 | 14 | 14 | 14 | 14 | 14 | 57 | 95 | 95 | 135 | 135 |
| Taiwan |  |  |  |  |  |  | 24 | 6 | 6 | 206 | 174 |
| Thailand |  |  |  |  |  |  |  |  |  | 24 | 24 |
| Turkey |  |  |  |  |  |  | 6 |  |  | 86 | 104 |
| Uganda |  |  |  |  |  |  |  |  |  | 8 | 8 |
| United Arab Emirates |  |  |  |  |  |  |  |  |  | 8 | 8 |
| United Kingdom | 49 | 49 | 49 | 49 | 49 | 49 | 204 | 286 | 272 | 721 | 724 |
| United States of America | 280 | 280 | 287 | 287 | 287 | 287 | 687 | 1175 | 1172 | 2560 | 2556 |
| Uruguay |  |  |  |  |  |  |  |  |  | 8 | 8 |

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

**Correlation - 0.3264**

**Conclusion –**

From the graph it was clear that the less number of populations have less number of universities. So, correlation between populations and number of universities are not dependent strongly.

1. **Are there any common criteria used by different ranking systems?**

|  |  |  |  |
| --- | --- | --- | --- |
| **Average of score** | Column Labels |  |  |
| Row Labels | 1 | 2 | 3 |
| Harvard University | 82 | 96 | 14 |
| University of Cambridge | 86 | 70 | 25 |
| University of California, Berkeley | 80 | 69 | 21 |
| Stanford University | 85 | 68 | 17 |
| California Institute of Technology | 90 | 65 | 47 |
| Princeton University | 86 | 59 | 48 |
| Columbia University | 84 | 59 | 21 |
| University of Chicago | 82 | 56 | 39 |
| University of Oxford | 90 | 55 | 22 |
| Yale University | 78 | 53 | 29 |
| Cornell University | 73 | 50 | 26 |
| University of California, Los Angeles | 80 | 48 | 25 |

**Conclusion -** Here we can see that thebetter of ranking criteria that university are well known for studies and research.

1. **How does the choice of ranking system affect a university's international student enrolment?**

**Correlation : - 0.0936**

**Conclusion –** International student admission are not dependent on University Ranking.

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

**Correlation : 0.1768**

**Conclusion –** Though correlation between Student-Staff ratio is not strong, but we can see that less number of student staff ratio the more scored have that university.

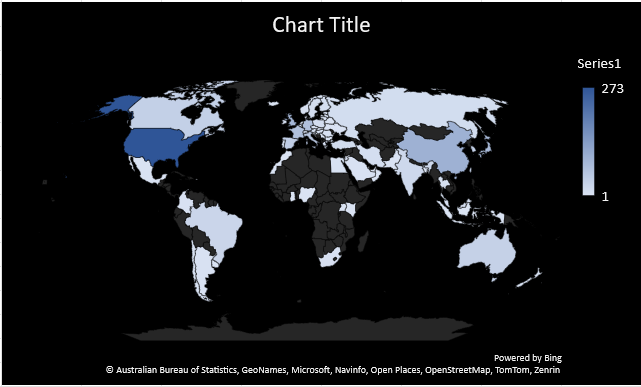
**10) How does the number of female students differ among universities?**

**Correlation: - 0.0146**

**Conclusion –** We can see the better number of university ranking has the more number of female students have.

**11)What is the distribution of universities across different countries?**

|  |  |
| --- | --- |
| Row Labels | Distinct Count of id |
| Argentina | 4 |
| Australia | 35 |
| Austria | 12 |
| Bangladesh | 1 |
| Belarus | 1 |
| Belgium | 11 |
| Brazil | 27 |
| Bulgaria | 1 |
| Canada | 37 |
| Chile | 7 |
| China | 96 |
| Colombia | 4 |
| Croatia | 1 |
| Cyprus | 1 |
| Czech Republic | 10 |
| Denmark | 6 |
| Egypt | 5 |
| Estonia | 2 |
| Finland | 10 |
| France | 68 |
| Germany | 68 |
| Ghana | 1 |
| Greece | 8 |
| Hong Kong | 6 |
| Hungary | 6 |
| Iceland | 1 |
| India | 22 |
| Indonesia | 1 |
| Iran | 11 |
| Ireland | 10 |
| Israel | 8 |
| Italy | 54 |
| Japan | 81 |
| Jordan | 2 |
| Kenya | 1 |
| Latvia | 1 |
| Lebanon | 1 |
| Lithuania | 1 |
| Luxembourg | 1 |
| Macau | 1 |
| Malaysia | 8 |
| Mexico | 3 |
| Morocco | 1 |
| Netherlands | 14 |
| New Zealand | 7 |
| Nigeria | 1 |
| Norway | 6 |
| Oman | 1 |
| Pakistan | 2 |
| Poland | 12 |
| Portugal | 9 |
| Puerto Rico | 1 |
| Qatar | 1 |
| Romania | 4 |
| Russia | 13 |
| Saudi Arabia | 4 |
| Serbia | 1 |
| Singapore | 2 |
| Slovakia | 2 |
| Slovenia | 2 |
| South Africa | 6 |
| South Korea | 37 |
| Spain | 43 |
| Sweden | 12 |
| Switzerland | 12 |
| Taiwan | 29 |
| Thailand | 7 |
| Turkey | 15 |
| Uganda | 1 |
| Ukraine | 2 |
| United Arab Emirates | 2 |
| United Kingdom | 89 |
| United States of America | 273 |
| Uruguay | 1 |

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

|  |  |  |
| --- | --- | --- |
| Row Labels | Total Students | Total Female students |
| 2011 | 4463626 | 8376 |
| 2012 | 858624 | 1530 |
| 2013 | 117195 | 208 |
| 2014 | 59555 | 216 |
| 2015 | 183218 | 391 |
| 2016 | 155365 | 380 |

**14) How has the ranking score of universities evolved over the years In India?**

|  |  |  |
| --- | --- | --- |
| **Average of score** | Column Labels |  |
| Row Labels | 2014 | 2015 |
| All India Institute of Medical Sciences, New Delhi | 508.13 | 556.63 |
| Banaras Hindu University | 443.75 | 475.63 |
| Indian Institute of Science | 347.13 | 320.50 |
| Indian Institute of Technology Bombay | 390.63 | 411.75 |
| Indian Institute of Technology Delhi | 433.25 | 463.13 |
| Indian Institute of Technology Kanpur | 366.75 | 430.38 |
| Indian Institute of Technology Kharagpur | 438.00 | 475.13 |
| Indian Institute of Technology Madras | 370.25 | 421.50 |
| Indian Institute of Technology Roorkee | 494.25 | 511.63 |
| Jadavpur University | 521.88 | 518.38 |
| Jawaharlal Nehru Centre for Advanced Scientific Research | 439.25 | 476.50 |
| Panjab University | 416.13 | 432.63 |
| Tata Institute of Fundamental Research | 376.63 | 409.38 |
| University of Calcutta |  | 459.00 |
| University of Delhi | 434.50 | 456.25 |
| University of Hyderabad | 552.38 | 583.50 |

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

**Correlation : -0.0699**

**Conclusion –** Though number of students and score has not strong correlation, but we can see the less number of students has in university the less scored they scored.

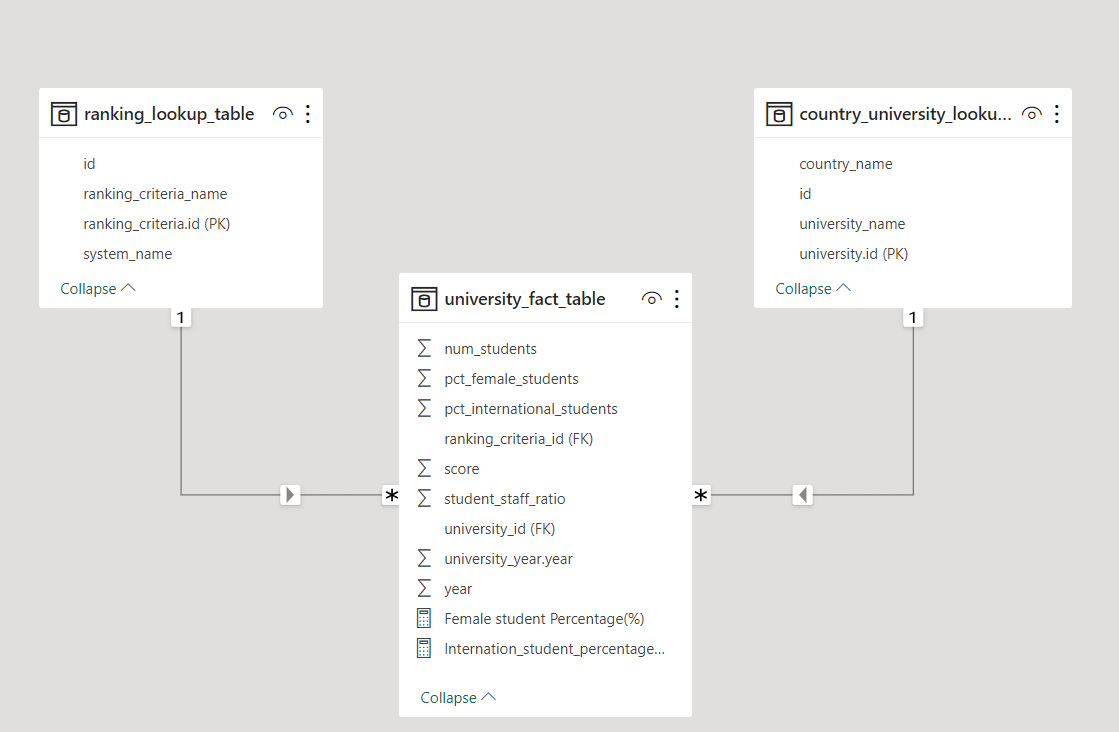
***Power BI Problem Statements***

**DASHBOARD**

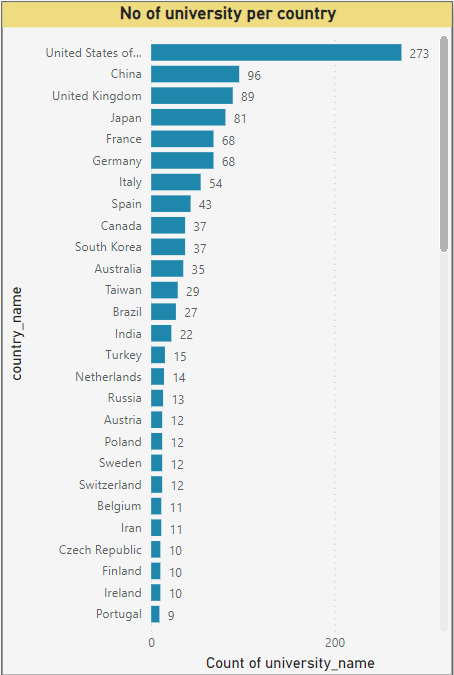
A screenshot of a computer screen

Description automatically generated

**DATA MODEL**

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1. **How many universities are there in each country?**

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America Leads the race for most number of University followed by China and UK.

**2 ) What is the distribution of international students across different countries?**

**A screenshot of a computer

Description automatically generated**

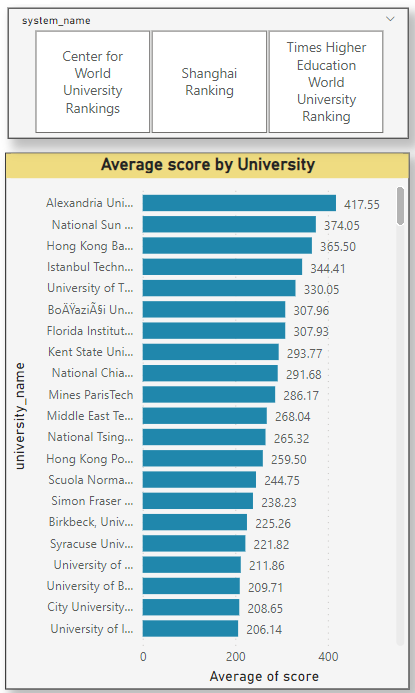
Conclusion: United States, UK, Australia, Canada is most preferred Country for abroad study

**Q.3 ) Which country has the highest number of female students enrolled in universities?**

**A screenshot of a computer

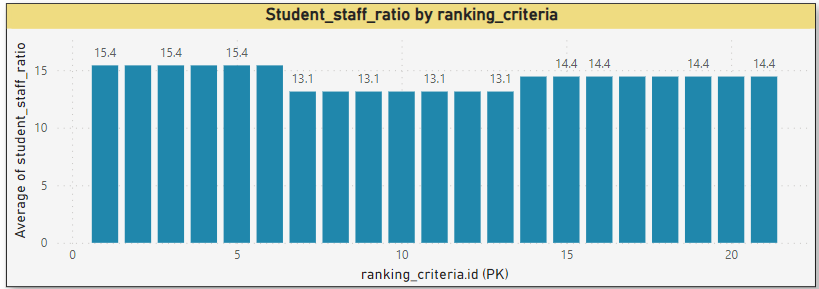
Description automatically generated**

**Q.4 ) What is the average score for universities according to each ranking system?**

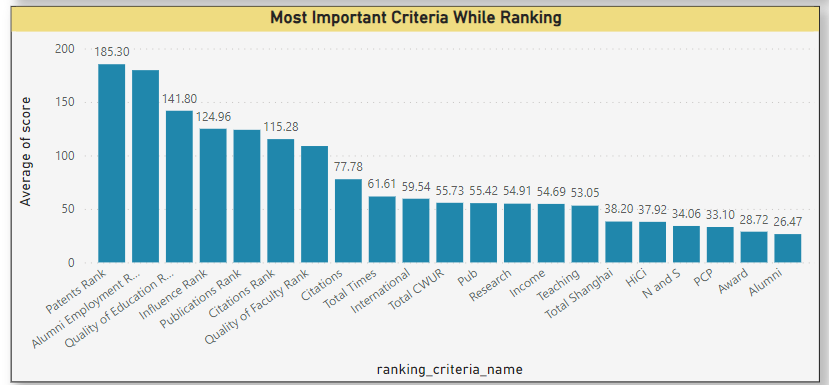
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You can navigate Ranking System in attached Power BI files, to see the difference in each ranking system.

**Q.5 ) How does the ranking system affect a university's student-staff ratio?**

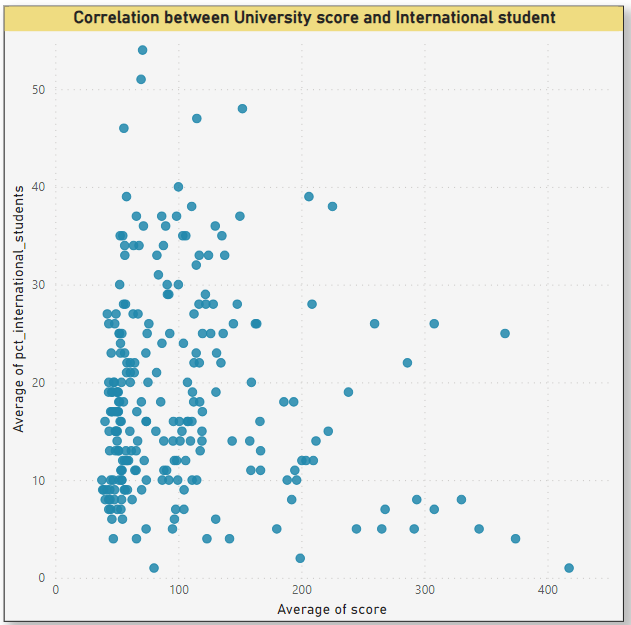
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**6 ) What are the most important criteria considered by ranking systems?**

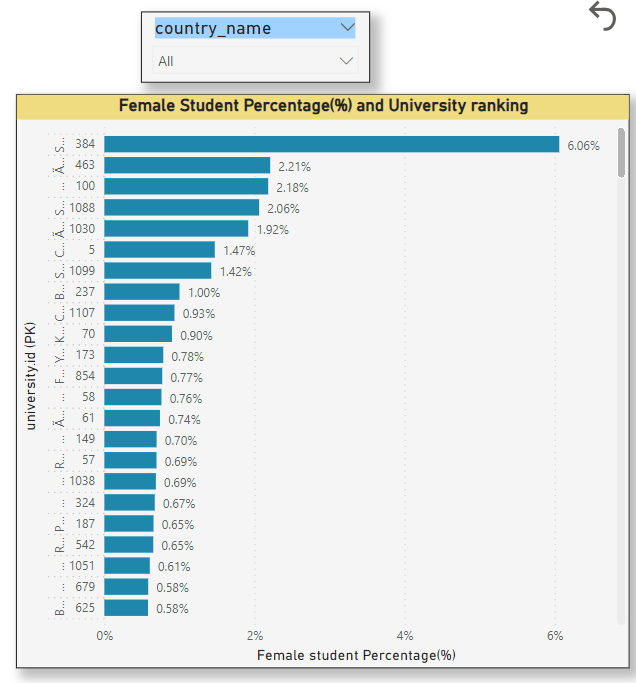
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We can see the **Patents Rank, Alumni Employment Rate, Quality of Education** are the most important criteria for Ranking.

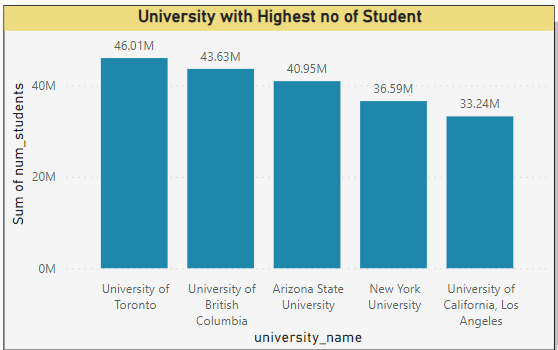
**7 ) Is there a correlation between a university's score and the number of international students?**

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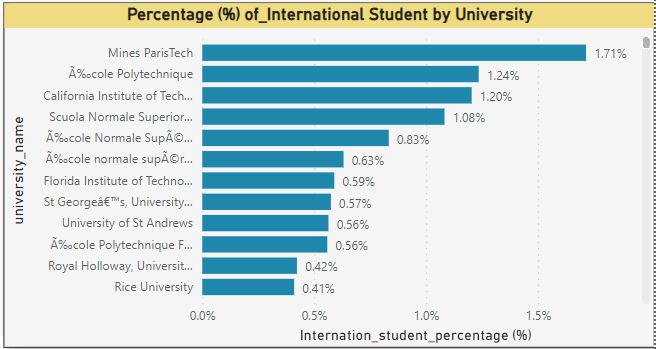
**8 ) How does the percentage of female students impact a university's ranking?**

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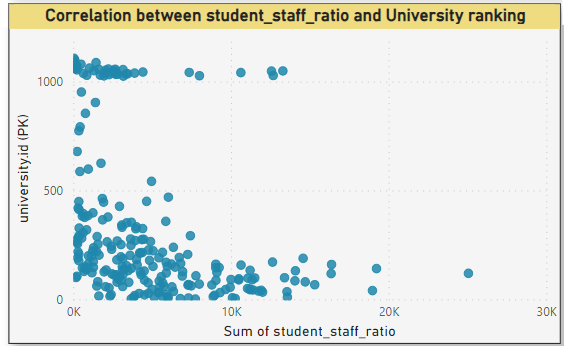
**9 ) Which university has the highest number of students?**

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**10 ) How does the percentage of international students vary across different universities?**

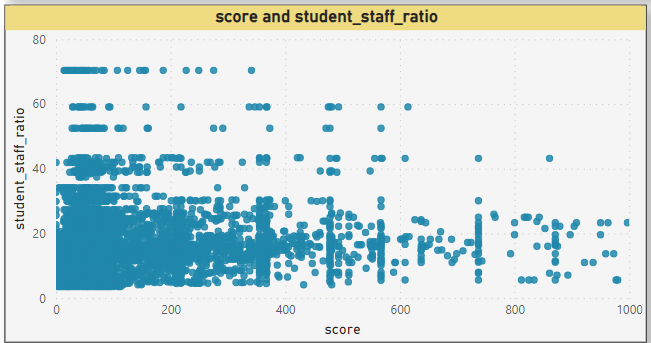
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**11 ) Is there a correlation between a university's ranking and its student-staff ratio?**

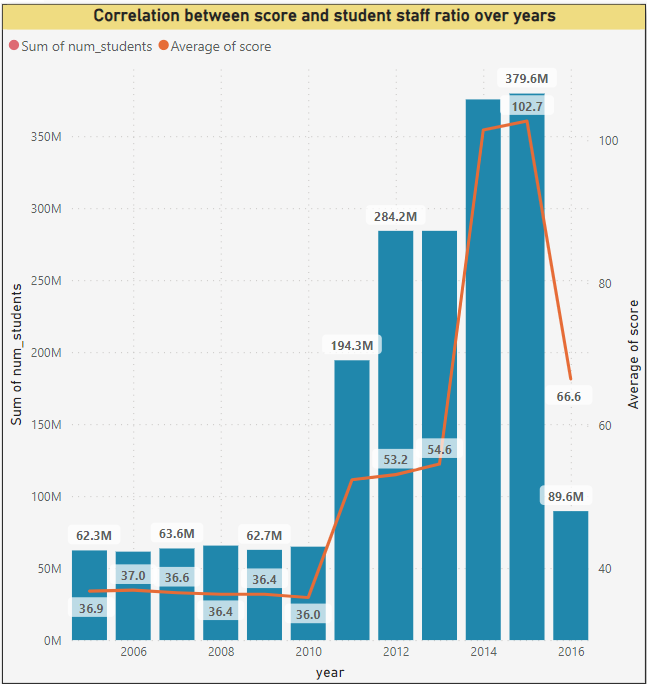
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Conclusion: Here we can see that the higher rate of Student-staff ratio the better University Ranking

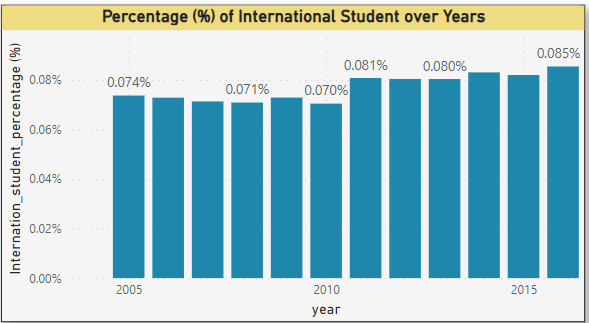
**12 )What is the correlation between score and student-staff ratio?**

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

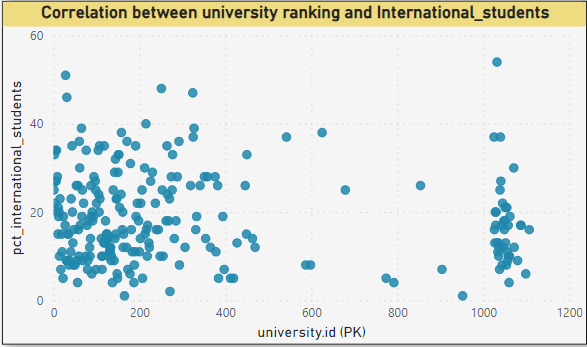
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**14 ) How does the percentage of international students vary across different years?**

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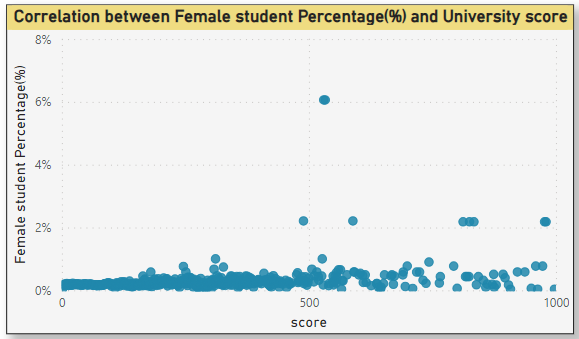
**Conclusion : Slowly international students percentage increased over years.**

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

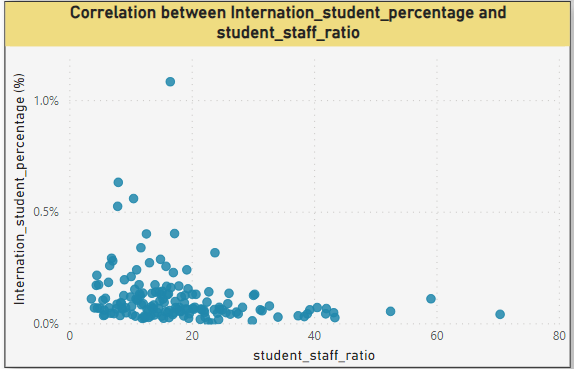
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Conclusion – Though numbers relation between university ranking and International students that not strong, but we can see that International student prefer better University Ranking Institute.

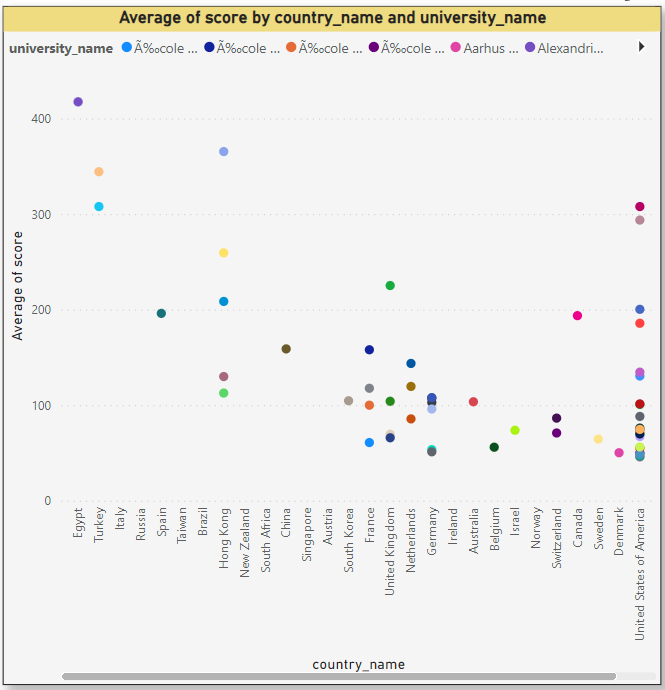
**16 ) Is there a relationship between a university's ranking score and the percentage of female students enrolled?**

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

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

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Conclusion – Most of the Countr’s University score are below 200.