

Analyzing International Education Costs dataset

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Exploratory analysis of International Education Costs dataset

Introduction

International Education Costs is a dataset taken for an exploration from kaggle (reference: <https://www.kaggle.com/datasets/adilshamim8/cost-of-international-education/data>). This dataset is a summary of international fees for universities based on countries, cities, tuition costs, various programs and living expenses.

Data:

- 1) Reference: <https://www.kaggle.com/datasets/adilshamim8/cost-of-international-education/data>
- 2) Sorted data by Columns: Country, City, University, Program, Level, Duration Years, Tuition(USD), Living Cost Index, Rent(USD), Visa fee(USD), Insurance(USD), Exchange rate.

Packages needed to load:

```
tinytex::install_tinytex() install.packages("dplyr") install.packages("ggplot2") install.packages("corrplot")
install.packages("GGally") library(corrplot) library(dplyr) library(ggplot2) library(corrplot) library(GGally)
```

Import the data:

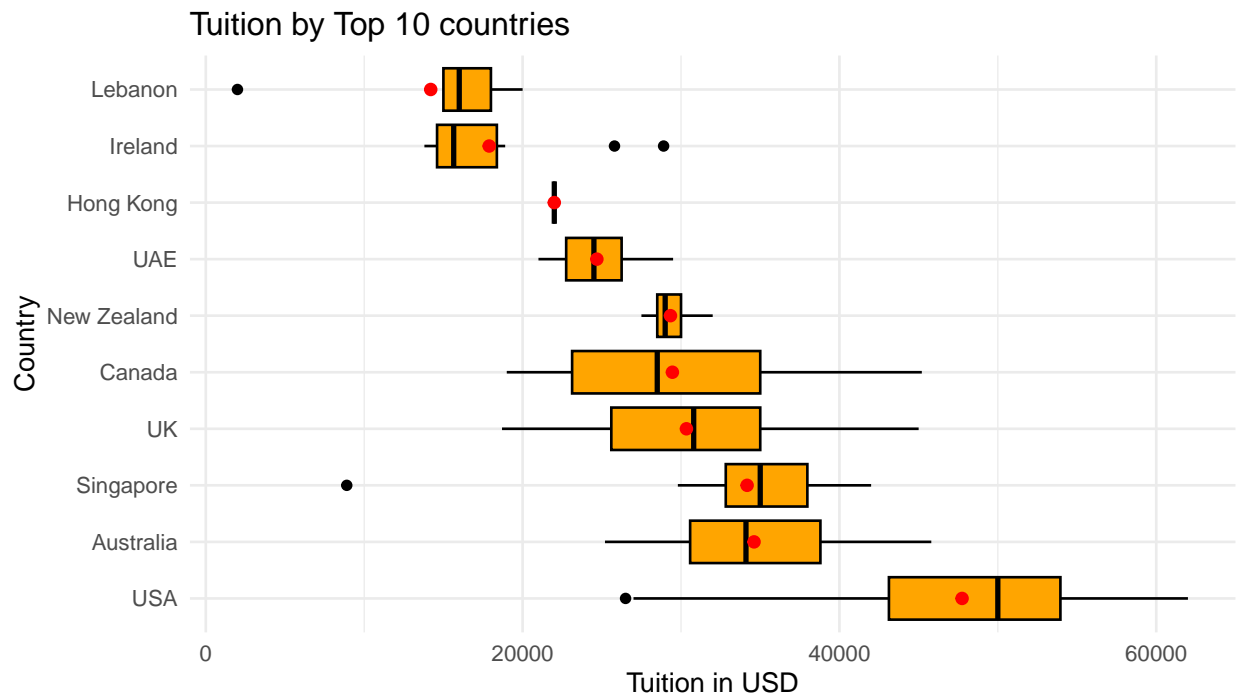
```
#Use: edu_data <- read.csv("C:/Users/ /Desktop/Rstudio projects/International_Education_Costs.csv")
#edu_data
```

Plot 1: Tuition by Top 10 Countries(with average tuition):

```
##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##   filter, lag

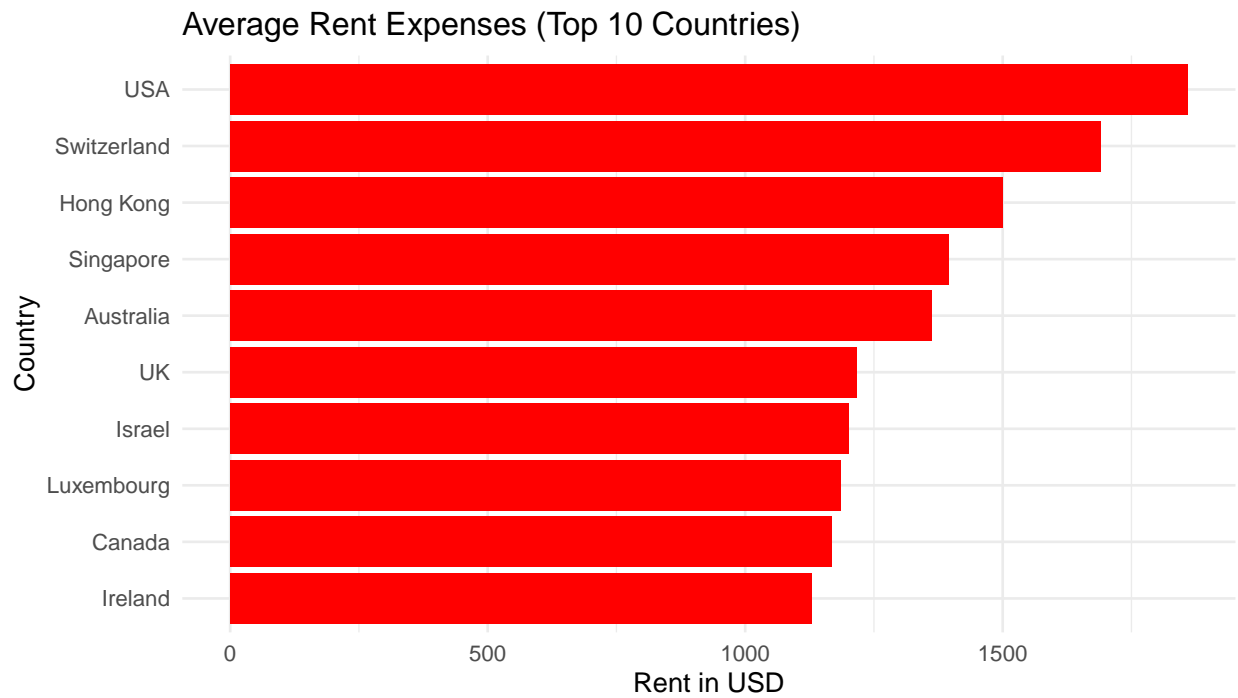
## The following objects are masked from 'package:base':
##
##   intersect, setdiff, setequal, union
```



Observations:

The graph shows the top 10 listed countries by their international tuition costs. The data demonstrates that among the top 10 countries with highest tuition: - Lebanon has the lowest average tuition (red point points away from the orange box range). - The UK has the most consistent, highest average cost (red point is within the range, and is in the perfect medium). - Countries like Australia and Canada show high consistency in their tuition costs.

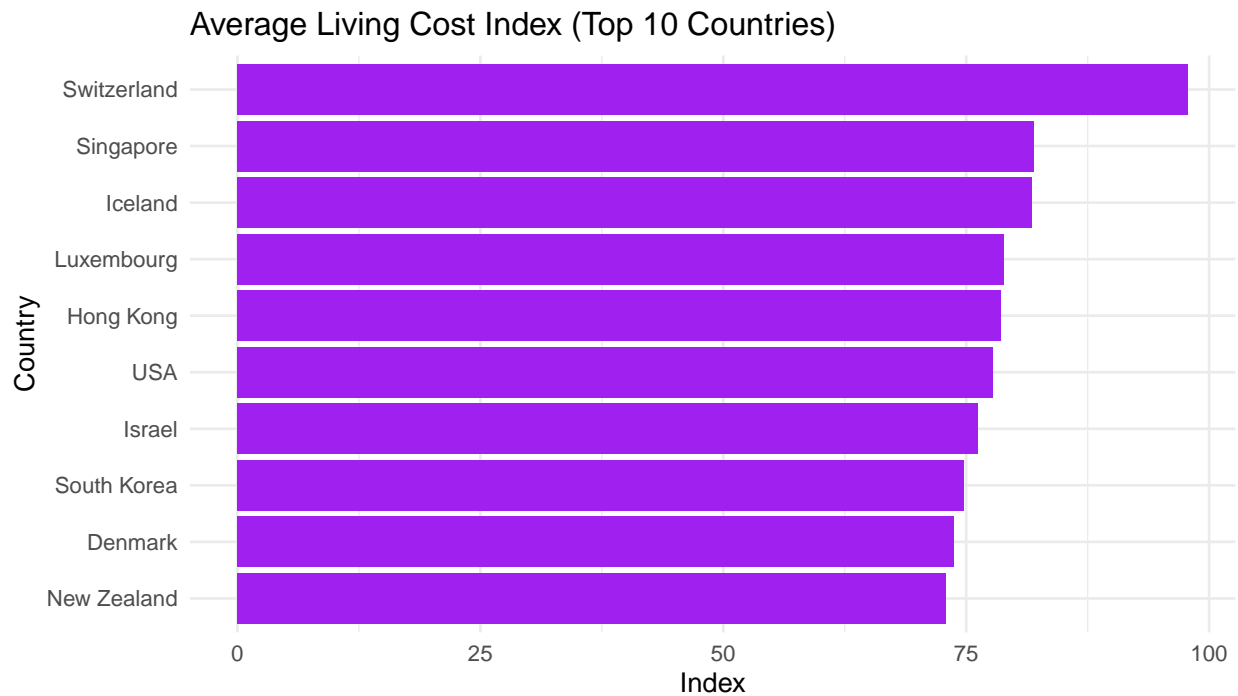
Plot 2: Rent expenses per Top 10 Countries



Observations:

The graph shows that in average, USA has the highest average rent expenses for students among the top 10 countries, whereas Ireland has the lowest ones.

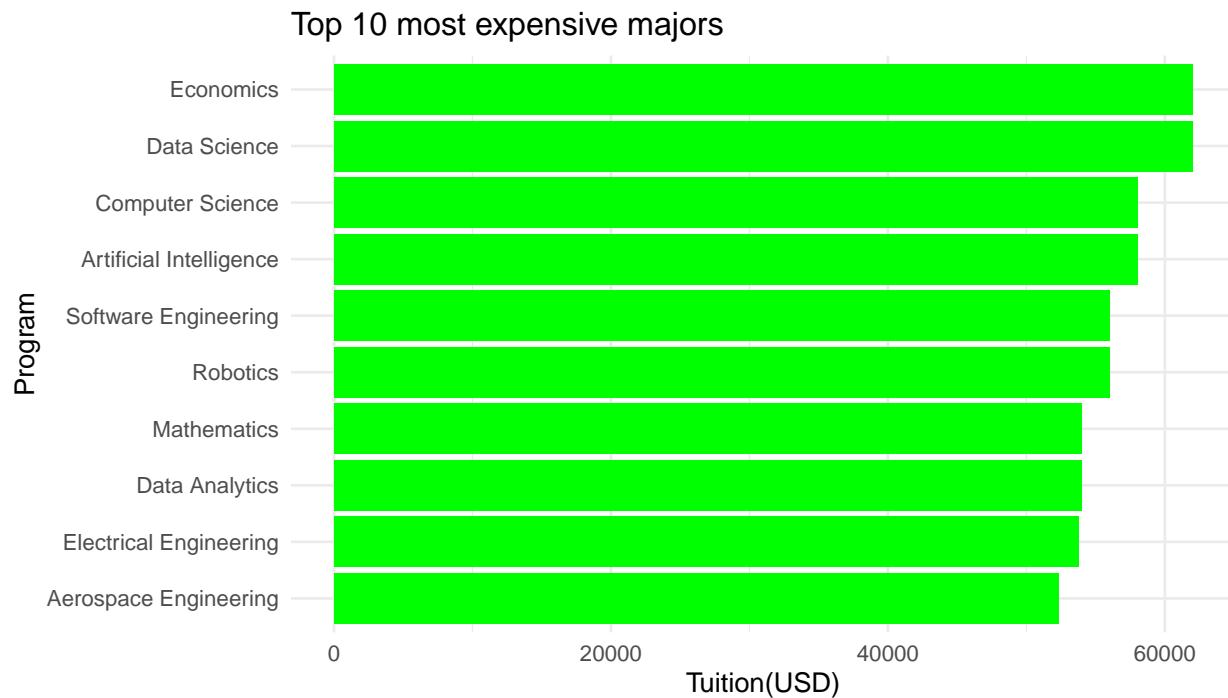
Plot 3: Average living cost in Top 10 Countries:



Observations:

The graph demonstrates top 10 countries with the highest rental expenses for international students. It is indicated that: - Switzerland has the highest living expenses for students. - New Zealand shows the lowest amount of expenses. - For all of the top 10 countries, the index of average living cost of students are more than a half of the total (>50). New Zealand with the lowest index shows about 74/100.

Plot 4: Top 10 most expensive majors by Tuition(in USD):



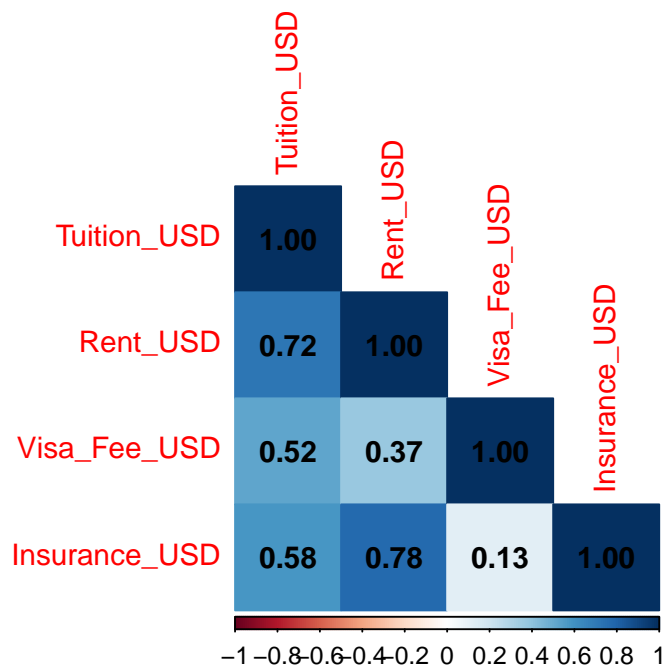
Observations:

The graph depicts top 10 the most expensive majors according to their tuition cost in USD. The data is grouped by Program column. Note: in data set, a program may be repeated as it also varies from university, therefore, the tuition is also different and the graph takes only its maximum. - On the graph, there are several majors who have the same maximum amount of tuition. To be more precise, if we do summary of the table of sorted majors, it is known that Data Science and Economics have maximum of 62000 USD; Computer Science and Artificial Intelligence 58000 USD. And so on to the bottom to the 10th most expensive major, it is Aerospace Engineering, which has a maximum of 52300 and does not share this maximum with any other major.

Plot 5: Correlation analysis between numeric data:

```
## corrplot 0.95 loaded
```

```
##          Tuition_USD  Rent_USD Visa_Fee_USD Insurance_USD
## Tuition_USD      1.0000000  0.7244450    0.5224905    0.5824071
## Rent_USD         0.7244450  1.0000000    0.3740794    0.7767705
## Visa_Fee_USD     0.5224905  0.3740794    1.0000000    0.1296552
## Insurance_USD    0.5824071  0.7767705    0.1296552    1.0000000
```

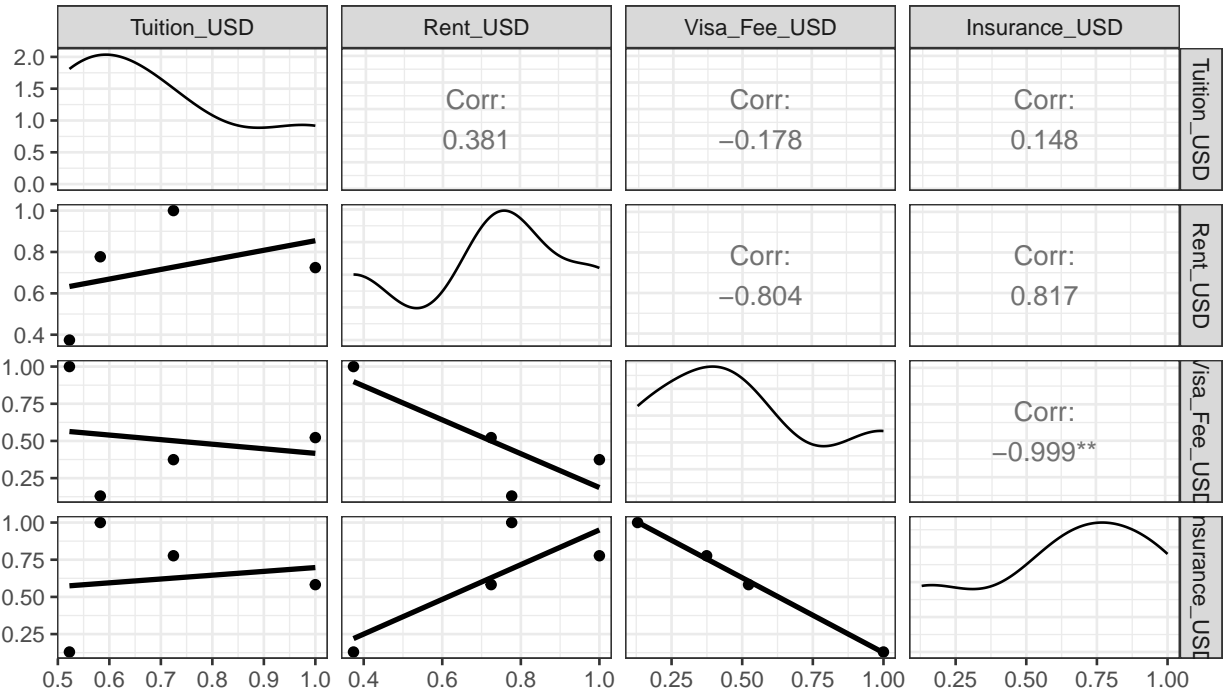


Observations:

The given graph shows the strength and direction of linear relationships between the numeric data from the data set - tuition cost, rent cost, visa fee and insurance cost. The relationships between data is set based on the scale from -1 to 1, where: 1) -1: perfect negative correlation; 2) 0: no correlation (no relationship); 3) 1: perfect positive correlation. Based on the graphic interpretation: - Rent and insurance correlation (0.78): means international students pay high insurance and rent; - Rent and tuition correlation (0.72): international students pay quite expensive cost for both, rent and tuition for studies (high tuition tends to come with high rent); - Insurance and tuition correlation (0.58): moderate positive relationship, the payment for insurance and tuition may vary and may not be the same; - Visa fee and tuition: moderate relationship, the cost may not be the same; - Visa fee and rent: weaker relationship, in most cases the costs for both of them may not be relevant; - Insurance and visa: quite irrelevant to each other data - costs vary.

Plot 6: linear relationship graph of correlated data:

```
## Registered S3 method overwritten by 'GGally':
##   method from
##   +.gg      ggplot2
```



Summary

This analysis highlights the financial landscape faced by international students across various countries. By examining tuition fees, rent expenses, and the general cost of living, we gain a clearer perspective on the most and least financially demanding study destinations.

- **Tuition Fees:** Countries like the United Kingdom, Australia, and Canada consistently show high and relatively stable tuition fees for international students. In contrast, Lebanon demonstrates significantly lower tuition costs, making it a more affordable option academically.
- **Rent Expenses:** The United States stands out as the country with the highest average rent, followed by other countries with high urban housing demand. Ireland ranks lowest in average rent among the top 10, suggesting more accessible accommodation options.
- **Living Cost Index:** Switzerland ranks highest in terms of living costs, indicating a generally expensive environment for students. Even the lowest country in the top 10 list, New Zealand, maintains a high living cost index, reinforcing that all top destinations carry a significant financial burden beyond tuition.
- **Expensive majors:** Most top 10 expensive majors share their maximum costs with other majors. The top leaders are Economics and Data Science with a cost of 62000 USD dollars. While aerospace engineering is the least in top 10 expensive majors with lowest maximum out of the rest programs.
- **Correlation of numeric data:** The analysis has shown that some data are set to be quite perfectly relevant, and some are least relevant. The significance of this work is to demonstrate that some data can be dependent on each other, and some don't. Based on this information, international students are tend to be paying more for both education and rent expenses, which makes it problematic in terms of finances.