In [145…
```
import pandas as pd
import numpy as np
import matplotlib
```

In [146…
```
df=pd.read_csv(r"C:\Users\USER\Desktop\International_Education_Costs.csv")
```

In [147…
```
df.head(2)
```

Out[147…

	Country	City	University	Program	Level	Duration_Years	Tuition_USD	Living_
0	USA	Cambridge	Harvard University	Computer Science	Master	2.0	55400	
1	UK	London	Imperial College London	Data Science	Master	1.0	41200	

In [148…
```
# Converting Tuition To Numeric For Statistical Analysis

df["Tuition_USD"]=pd.to_numeric(df["Tuition_USD"])
```

In [149…
```
# Converting All Aggregate Column To Numeric For Statistical Analysis

df[["Living_Cost_Index","Rent_USD","Visa_Fee_USD",
    "Insurance_USD","Exchange_Rate"]]=df[["Living_Cost_Index","Rent_USD","Visa_Fee_
                                          "Insurance_USD","Exchange_Rate"]].apply(p
```

In [150…
```
df.head(2)
```

Out[150…

	Country	City	University	Program	Level	Duration_Years	Tuition_USD	Living_
0	USA	Cambridge	Harvard University	Computer Science	Master	2.0	55400	
1	UK	London	Imperial College London	Data Science	Master	1.0	41200	

In [151…
```
# Average Tuition Per Program
## this shows the average Tuition fee for ech program

df.groupby("Program")[["Tuition_USD"]].agg(["mean"]).head(10)
```

Out[151…

Program	Tuition_USD mean
AI Engineering	6100.000000
Aerospace Engineering	26150.000000
Applied Mathematics	3900.000000
Architecture	3150.000000
Artificial Intelligence	12895.471698
Bioinformatics	5880.000000
Biomedical Sciences	16650.000000
Biotechnology	20000.000000
Business	20450.000000
Business Analytics	22760.000000

In [277…

```
# Tuition Per Program In Each University.
## this shows the tuition fee for programs in each university.

df.groupby(["University","Program"])[["Tuition_USD"]].max().sort_values(by="Tuition
```

Out[277…

University	Program	Tuition_USD
Columbia University	Data Science	62000
	Economics	62000
MIT	Computer Science	58000
Harvard University	Artificial Intelligence	58000
University of Chicago	Data Science	58000
	Artificial Intelligence	58000
Stanford University	Computer Science	57000
Carnegie Mellon	Data Science	56000
	Software Engineering	56000
Massachusetts	Robotics	56000

In [250…

```
# Sum Of Tuition Per Program
## this shows each Programs cumulative tuition across all Universities
```

```
df.groupby("Program")[["Tuition_USD"]].sum().sort_values(by="Tuition_USD",ascending
```

Out[250…

Program	Tuition_USD
Computer Science	7864360
Data Science	1377530
Computer Engineering	695680
Artificial Intelligence	683460
Data Analytics	655900
Software Engineering	583270
Information Systems	249970
Engineering	235800
Mathematics	233000
Physics	208660

In [154…

```
# Average Living Cost Index And Rent
## This Shows the average cost of living in a country based on LIVING COST INDEX an
### Student who are planning on studying in particular countries should take note o

df.groupby("Country")[["Living_Cost_Index","Rent_USD"]].agg("mean").sort_values(by=
```

Out[154…

Country	Living_Cost_Index	Rent_USD
Switzerland	97.820000	1690.000000
Singapore	82.022222	1394.444444
Iceland	81.750000	1016.666667
Luxembourg	78.900000	1185.714286
Hong Kong	78.600000	1500.000000
USA	77.796154	1858.974359
Israel	76.200000	1200.000000
South Korea	74.752174	669.565217
Denmark	73.720000	1103.333333
New Zealand	72.866667	1005.555556

In [164…
```
# Creating Living Cost Category To Filter Living Cost Index


def Living_Cost_Category (Living_Cost_index):
    if Living_Cost_index < 50:
        return "Low"
    elif Living_Cost_index < 80:
        return "medium"
    else:
        return "High"

df["Living_Cost_index"] = df["Living_Cost_Index"].apply(Living_Cost_Category)
```

In [162…
```
# Number of countries under each living cost index category

df.groupby("Living_Cost_index")[["Country"]].nunique()
```

Out[162…

Living_Cost_index	Country
High	12
Low	34
medium	47

In [248…
```
#  Cost Of Studying in each University
## This involves creating a new column which Includes The Summation Of All Expenses
### Adding the tuition,visa,insurance and rent (Multiplying the rent by 12 months)
#### The Top 10 Most Expensive

df["Total_Cost"] = df["Tuition_USD"] + (df["Rent_USD"] * 12) + df["Visa_Fee_USD"] +
df.groupby("University")[["Total_Cost"]].max().sort_values(by="Total_Cost",ascendin
```

Out[248...

University	Total_Cost
Columbia University	93660
Stanford University	87460
Harvard University	86060
MIT	85060
Massachusetts	82860
UC Berkeley Extension	82460
University of Chicago	82460
Northeastern University	82060
Yale University	81360
UCLA	80060

In [243...

```
#  Cost Of Studying in each University
## The least Expensive Schools top 10
### this shows university of Tlemcen as the most affordable university

df["Total_Cost"] = df["Tuition_USD"] + (df["Rent_USD"] * 12) + df["Visa_Fee_USD"] +
df.groupby("University")[["Total_Cost"]].max().sort_values(by="Total_Cost",ascendin
```

Out[243...

University	Total_Cost
University of Tlemcen	3100
National University of Cuyo	3130
National University of La Plata	3250
University of Carthage	3260
Badji Mokhtar University	3440
National University of Rosario	3490
University of Gabes	3580
University of Sousse	3720
National University of Cordoba	3730
University of Monastir	3900

In [214...

```
# university Program
## this shows the Unique Number Of Program Offered in each university
```

```
df.groupby("University")[["Program"]].nunique().sort_values(by="Program",ascending=
```

Out[214…

University	Program
University of Bristol	4
Georgia Tech	4
University of Leeds	4
UT Austin	4
University of Washington	4
University of Manchester	4
University of Tasmania	3
University of Wollongong	3
Politecnico di Milano	3
University of Western Australia	3

In [208…

```
# Number Of Program Entries In Each University
## this shows how many Program entries were recorded in each university
### University of Washington ranks number 1

df.groupby("University")[["Program"]].count().sort_values(by="Program",ascending=Fa
```

Out[208…

University	Program
University of Washington	6
University of Wollongong	5
Stanford University	5
University of Adelaide	5
University of Western Australia	5
University of Newcastle	5
University of Sydney	5
University of Tasmania	5
Griffith University	5
Australian National University	5

In [209…

```
# Number Of Times Each Program Was Taken In Each University
```

```
df.groupby("University")[["Program"]].value_counts().sort_values(ascending=False).h
```

Out[209…

```
University                     Program
University of Adelaide         Computer Science    4
Australian National University Computer Science    4
McGill University              Computer Science    3
James Cook University          Computer Science    3
University of Washington       Computer Science    3
University of New England      Computer Science    3
University of New South Wales  Computer Science    3
University of Newcastle        Computer Science    3
University of Nottingham       Computer Science    3
Griffith University            Computer Science    3
Name: count, dtype: int64
```

In [ ]:

```
# Filtering Computer Science Into A Seperate Table For Unique Calculation as it has


cs_df = df[df["Program"].str.contains("Computer Science", case=False, na=False)]
```

In [240…

```
# University with highest tuition fee
## this shows the most expenisve tuition fee for universities
### Columbia University ranks Number 1 on the list

df.groupby ("University")[["Tuition_USD"]].max().sort_values(by="Tuition_USD",ascen
```

Out[240…

University	Tuition_USD
Columbia University	62000
MIT	58000
University of Chicago	58000
Harvard University	58000
Stanford University	57000
Carnegie Mellon	56000
Massachusetts	56000
Yale University	54500
Princeton University	54000
UC Berkeley	54000

In [202…

```
#  Countrys living cost index
## this shows the top 10 countries with high living cost index
### Switzerland ranks number 1

df.groupby (["Country","Living_Cost_index"])[["Living_Cost_Index"]]. max().sort_val
```

Out[202…

		Living_Cost_Index
Country	**Living_Cost_index**	
Switzerland	**High**	122.4
USA	**High**	100.0
South Korea	**High**	85.1
Iceland	**High**	84.5
France	**High**	84.3
Singapore	**High**	83.8
Ireland	**High**	83.6
Luxembourg	**High**	83.2
Denmark	**High**	83.2
Norway	**High**	83.2

In [203…

```
#  Countrys living Cost index
## this shows the top 10 countries with low living cost index
### Tunisia ranks number 1

df.groupby (["Country","Living_Cost_index"])[["Living_Cost_Index"]]. max().sort_val
```

Out[203…

		Living_Cost_Index
Country	**Living_Cost_index**	
Tunisia	**Low**	35.8
Egypt	**Low**	38.4
Algeria	**Low**	38.5
Nigeria	**Low**	40.2
Colombia	**Low**	41.2
Ghana	**Low**	42.1
Bangladesh	**Low**	42.5
Dominican Republic	**Low**	42.5
Argentina	**Low**	42.6
Morocco	**Low**	43.5

In [204…

```
# Cost Impact Of Country Exchange Rate to USD
## this shows the impact of exchange rate of countries currency to USD
### iran ranks number one country experiencing high impact
```

```
df.groupby ("Country")[["Exchange_Rate"]].max().sort_values(by="Exchange_Rate",asce
```

Out[204…

Country	Exchange_Rate
Iran	42150.00
Vietnam	24450.00
Indonesia	15640.00
Lebanon	15000.00
Uzbekistan	12300.00
Colombia	3950.00
South Korea	1320.50
Nigeria	860.20
Argentina	821.50
Hungary	350.25

In [255…

```
# City with Most Entries
## this shows the city with the most demand
### singapore ranking number 1

df[["City"]].value_counts().sort_values(ascending=False).head(10)
```

Out[255…

```
City
Singapore    18
Sydney       11
Melbourne    11
London       10
Canberra      8
Newcastle     7
Brisbane      7
Seattle       6
Seoul         6
Cambridge     6
Name: count, dtype: int64
```

In [219…

```
# Universities With Most Entries
## this shows Universities with most entries
### University of Washinghton ranking number 1

df[["University"]].value_counts().sort_values(ascending=False).head(10)
```

Out[219…
```
University
University of Washington           6
University of Sydney               5
University of Wollongong           5
Australian National University     5
Griffith University                5
University of Tasmania             5
University of Melbourne            5
University of Newcastle            5
University of Western Australia    5
University of Adelaide             5
Name: count, dtype: int64
```

In [220…
```
# Program With Most Entry
## this shows the programs with high demand
### Computer science Ranking Number 1

df[["Program"]].value_counts().head(10)
```

Out[220…
```
Program
Computer Science           312
Data Science                82
Computer Engineering        71
Software Engineering        57
Artificial Intelligence     53
Data Analytics              50
Information Systems         40
Information Technology      24
Software Development        22
Data Engineering            19
Name: count, dtype: int64
```

In [221…
```
# Country With Most Entry
## this shows the country experiencing high demand

df[["Country"]].value_counts().sort_values(ascending=False).head(10)
```

Out[221…
```
Country
UK             93
Australia      86
USA            78
Canada         76
Germany        33
France         27
South Korea    23
Netherlands    21
Switzerland    20
Singapore      18
Name: count, dtype: int64
```

In [222…
```
# Level With Most Entries
## this shows the level of education with most entries
### with Masters Level ranking number 1

df[["Level"]].value_counts()
```

Out[222…
```
Level
Master      451
Bachelor    297
PhD         159
Name: count, dtype: int64
```

In [228…
```
# Tuition For Each Level of education
## this shows the mpost expensive level of education
### Masters level Ranking most expensive and PHD level being the most affordable

df.groupby("Level")[["Tuition_USD"]].max().sort_values(by="Tuition_USD",ascending=F
```

Out[228…

Level	Tuition_USD
Master	62000
Bachelor	57000
PhD	56000

In [257…
```
# Total Cost For Studying A Pogram At Different Levels In Universities
## this total cost covers (Visa,Rent,Tuition and Insurance)
## Top 10 Most Expensive
df.groupby(["University","Program","Level"])[["Total_Cost"]].max().sort_values(by="
```

Out[257…

University	Program	Level	Total_Cost
Columbia University	**Data Science**	**Master**	93660
	Economics	**Master**	93660
Stanford University	**Computer Science**	**Bachelor**	87460
Harvard University	**Artificial Intelligence**	**Master**	86060
Stanford University	**Data Science**	**Master**	85460
MIT	**Computer Science**	**Bachelor**	85060
		Master	84860
Stanford University	**Computer Science**	**PhD**	83460
Harvard University	**Computer Science**	**Master**	83460
Massachusetts	**Robotics**	**PhD**	82860

In [258…
```
# Total Cost For Studying A Pogram At Different Levels In Universities
## this total cost covers (Visa,Rent,Tuition and Insurance)
### Top 10 Most Affordable

df.groupby(["University","Program","Level"])[["Total_Cost"]].sum().sort_values(by="
```

Out[258...

University	Program	Level	Total_Cost
University of Tlemcen	Information Systems	Bachelor	3100
National University of Cuyo	Data Analytics	PhD	3130
National University of La Plata	Software Development	Bachelor	3250
University of Carthage	Artificial Intelligence	Bachelor	3260
Badji Mokhtar University	Computer Engineering	Master	3440
National University of Rosario	Computer Engineering	Master	3490
University of Gabes	Computer Engineering	Master	3580
University of Sousse	Computer Systems	Bachelor	3720
National University of Cordoba	Data Science	Master	3730
University of Monastir	Data Science	PhD	3900

In [259...

```
# Cities with High Rent

df.groupby("City")[["Rent_USD"]].max().sort_values(by="Rent_USD",ascending=False).h
```

Out[259...

City	Rent_USD
New York	2500
San Francisco	2400
Stanford	2400
Berkeley	2300
Cambridge	2300
Los Angeles	2200
Boston	2200
London	2200
MIT	2100
New Haven	2100

In [260...

```
# Cities with low Rent

df.groupby("City")[["Rent_USD"]].max().sort_values(by="Rent_USD",ascending=True).he
```

Out[260…

City	Rent_USD
Bizerte	150
Aswan	160
Gabes	160
Tlemcen	160
Sylhet	160
Mansoura	170
Rajshahi	170
Monastir	170
Annaba	180
Port Said	180

In [261…

```
# Countries with High Visa Fee

df.groupby("Country")[["Visa_Fee_USD"]].max().sort_values(by="Visa_Fee_USD",ascendi
```

Out[261…

Country	Visa_Fee_USD
UK	490
Australia	450
Denmark	450
Finland	350
New Zealand	330
Norway	275
UAE	270
Saudi Arabia	250
Canada	235
Japan	220

In [262…

```
# Countries with Low Visa Fee

df.groupby("Country")[["Visa_Fee_USD"]].max().sort_values(by="Visa_Fee_USD",ascendi
```

Out[262…

Country	Visa_Fee_USD
Tunisia	60
Morocco	70
Algeria	80
Poland	80
Slovenia	80
Colombia	80
Croatia	80
Uruguay	90
Singapore	90
Serbia	90

In [263…

```
# Number Of Universities in each country

df.groupby("Country")[["University"]].nunique().sort_values(by="University",ascendi
```

Out[263…

Country	University
UK	56
USA	40
Canada	26
Australia	23
Germany	22
South Korea	20
France	17
Spain	13
Netherlands	13
Switzerland	13

In [268…

```
# Universities with High Insurance Rate

df.groupby("University")[["Insurance_USD"]].max().sort_values(by="Insurance_USD",as
```

Out[268…

University	Insurance_USD
Texas A&M University	1500
Ohio State University	1500
University of Wisconsin-Madison	1500
University of Wisconsin	1500
Northeastern University	1500
University of Washington	1500
NC State University	1500
University of Colorado	1500
University of Texas Austin	1500
Massachusetts	1500

In [269…

```
# Universities with Low Insurance Rate

df.groupby("University")[["Insurance_USD"]].max().sort_values(by="Insurance_USD",as
```

Out[269…

University	Insurance_USD
SUST	200
RUET	200
University of Constantine	200
University of Gabes	200
University of Carthage	200
Mansoura University	200
Aswan University	200
CUET	200
Cairo University	200
Port Said University	200

In [270…

```
df.head(1)
```

Out[270…

	Country	City	University	Program	Level	Duration_Years	Tuition_USD	Living_
0	USA	Cambridge	Harvard University	Computer Science	Master	2.0	55400	

In [ ]: