

## Write up

### Introduction:

According to the data cleaning related to the trends in international migrant stock from midterm project, this project will explore the migration trends of the international migrant stock in developing and developed countries, the comparison of total population of countries, popular destination of migrants, and the percentage of international migrants in developing and developed countries.

### Method:

Utilized Pandas Dataframe to manipulate and wrangle dataset cleaned by the previous section. Extracted and filtered the specific major areas and countries from the dataset to compare total migrants, population and migrant-population ratio from 1990 - 2015 and, in the meantime, divided the dataset by gender to explore the difference of preference on the migrant destination. Based on Tufte's data visualization principles, visualize data insights retrieved from data manipulation and wrangling.

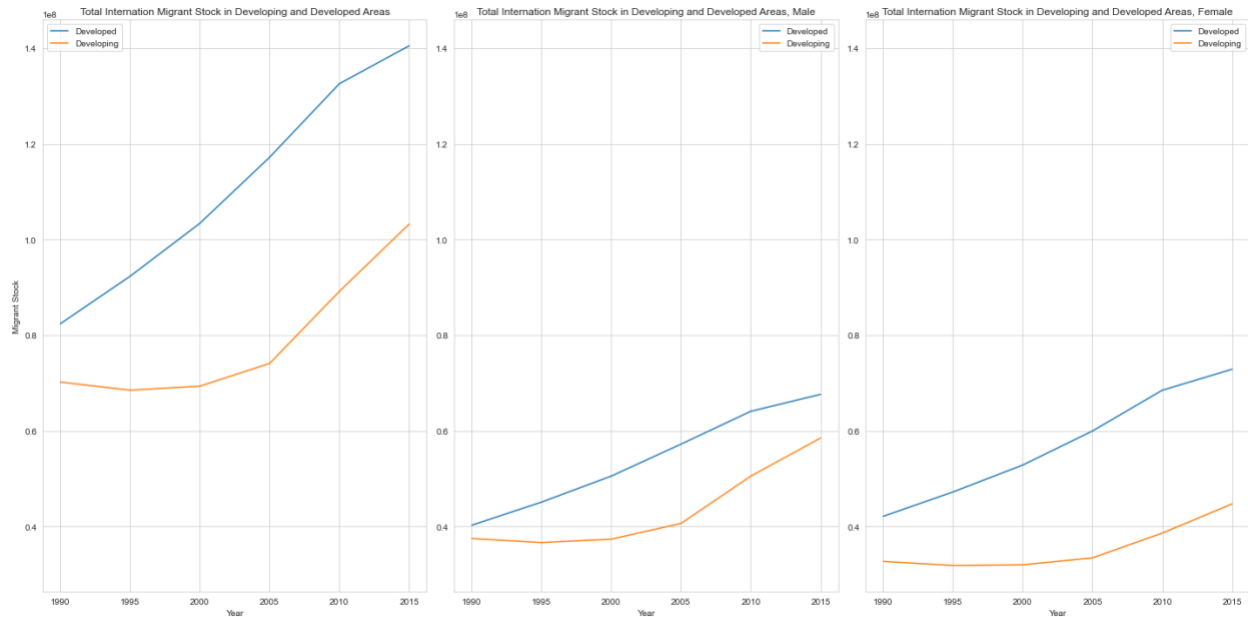
### Results:

1. What is the tendency of the total international migrant stock in developing and developed countries from 1990-2015? What might be the reason of that?

In [184]: `table1_new.head()`

Out[184]:

	Country code	(International migrant stock at mid-year (both sexes), 1990.0)	(International migrant stock at mid-year (both sexes), 1995.0)	(International migrant stock at mid-year (both sexes), 2000.0)	(International migrant stock at mid-year (both sexes), 2005.0)	(International migrant stock at mid-year (both sexes), 2010.0)	(International migrant stock at mid-year (both sexes), 2015.0)	(International migrant stock at mid-year (male), 1990.0)	(International migrant stock at mid-year (male), 1995.0)	(International migrant stock at mid-year (male), 2000.0)	(International migrant stock at mid-year (male), 2005.0)
Major area											
WORLD	900.0	152563212.0	160801752.0	172703309.0	191269100.0	221714243.0	243700236.0	77747510.0	81737477.0	87884839.0	97866674.0
Developed regions	901.0	82378628.0	92306854.0	103375363.0	117181109.0	132560325.0	140481955.0	40263397.0	45092799.0	50536796.0	57217777.0
Developing regions	902.0	70184584.0	68494898.0	69327946.0	74087991.0	89153918.0	103218281.0	37484113.0	36644678.0	37348043.0	40648897.0
Least developed countries	941.0	11075966.0	11711703.0	10077824.0	9809634.0	10018128.0	11951316.0	5843107.0	6142712.0	5361902.0	5383009.0
Less developed regions excluding least developed countries	934.0	59105261.0	56778501.0	59244124.0	64272611.0	79130668.0	91262036.0	31641006.0	30501966.0	31986141.0	35265888.0



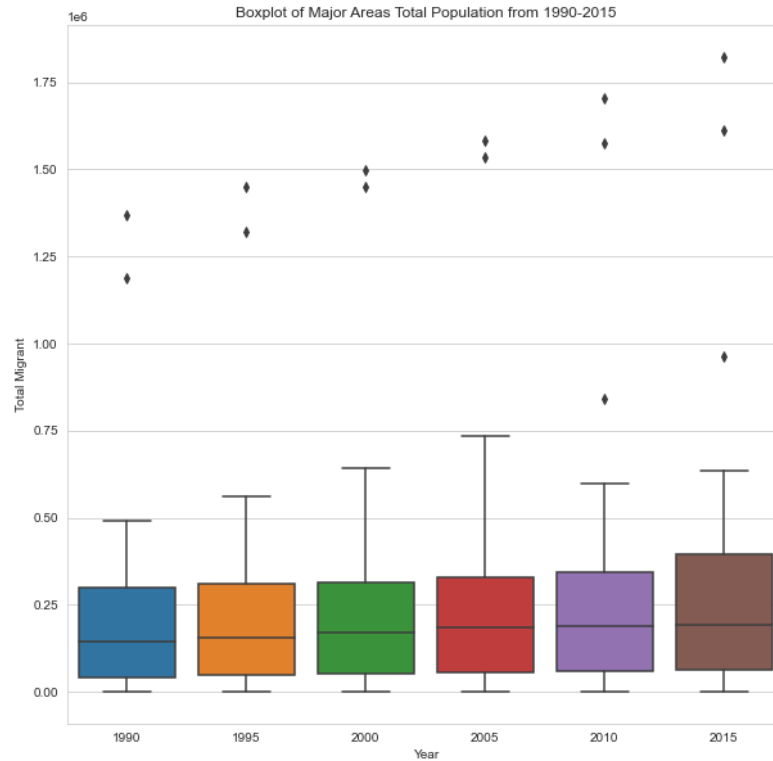
### Observation:

As the graph shown on the left hand side, total international migrant stock in developed countries increase steadily year by year, it's particularly worth to mention that the migrant stock increase more sharper in developing countries after 2005. It indicates that transportation and economics in developing countries have experienced rapid development since 2005. Furthermore, comparing male and female, the number of male and female migrants in developed countries is more average, and is rising year by year. However, the female migrants are less than male migrants in developing countries, the cultures and labor market of developing countries may be one reason. As we know, developing countries have a lot of manufacturing and heavy industries, and they need a lot of strong labor force, so this will attract many male migrants.

## 2. The comparison of total population in major area from 1990-2015.

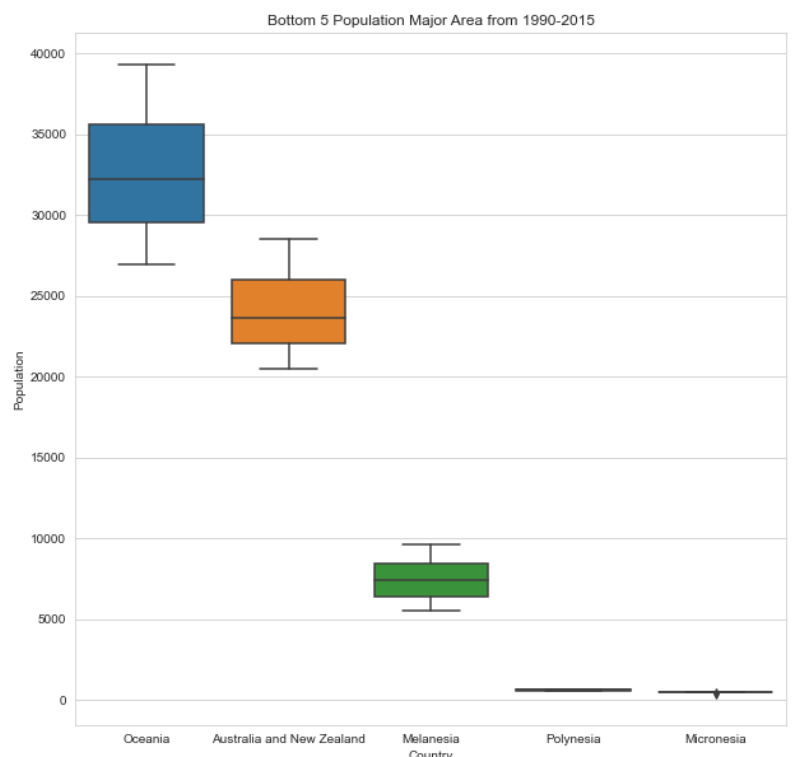
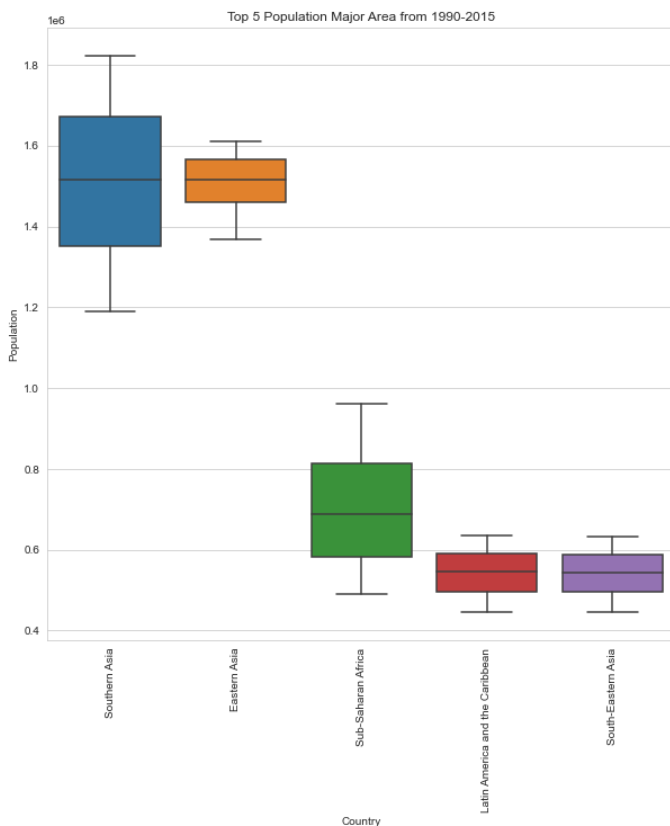
Major areas include:

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In [194]: major_area = ['Sub-Saharan Africa',
                        'Eastern Africa', 'Middle Africa', 'Northern Africa', 'Southern Africa', 'Western Africa',
                        'Central Asia', 'Eastern Asia', 'South-Eastern Asia', 'Southern Asia', 'Western Asia',
                        'Eastern Europe', 'Northern Europe', 'Southern Europe', 'Western Europe', 'Latin America and the Caribbean',
                        'Caribbean', 'Central America', 'South America', 'Northern America', 'Oceania', 'Australia and New Zealand',
                        'Melanesia', 'Micronesia', 'Polynesia']
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Observations:

This box plot shows the total population in major area from 1990-2015. We can see that the median increase gradually in every five years. It's because of globalization, more and more people have the chance to go aboard and emigrates to other countries. What's more, after 2010, the outliers are increased, so I did other two boxplots to see which top 5 and bottom 5 population countries are.



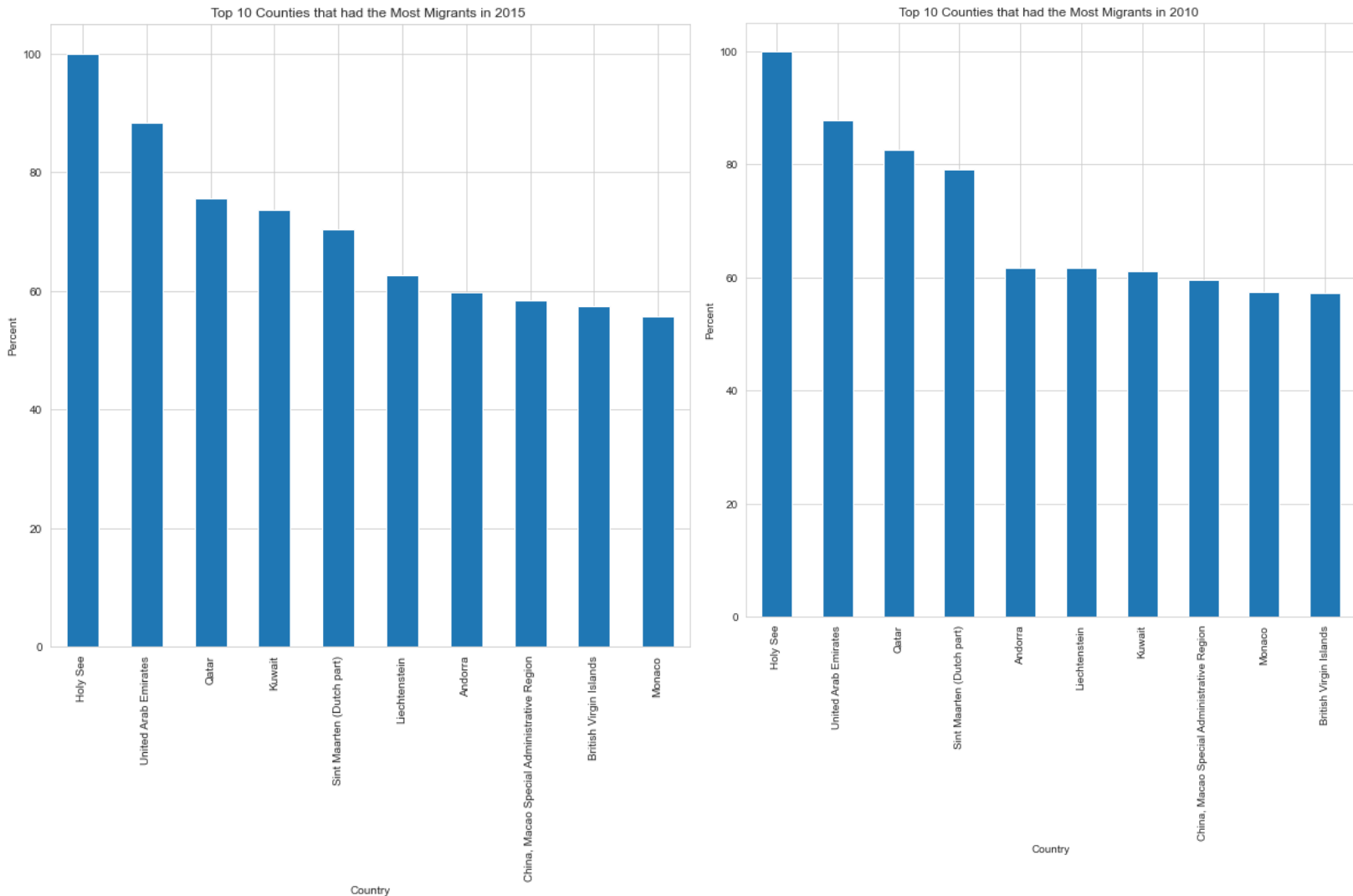
From this two graphs, southern Asia is the top one which have most population. This is because family planning is not controlled seriously in this area, and aging of population is a heavy problem in Asia. Furthermore, rapid development over the decades in southern-Asia is also one of the reason that population increase constantly, since more and more migrants try to seek job opportunities in southern-Asia. On the other side, Micronesia has the lowest population, this is no surprise, since it's an island country.

### 3. What is the most popular destination of migrant?



From this bar chart, United States of America occupies the most popular destination of migrants. And the population of U.S has been increased constantly. More and more people like to immigrate to developed countries, for example, level of education can be one reason attracting more migrants.

#### 4. The percentage of developed and developing countries international migrant stock in 2010 and 2015.



With the development of the society, Immigration has become a trend, so I compare the recent years 2015 and 2010. We can see that Holy See has most migrants, reach 100%. Because all people from Holy See are migrants. The second country is United Arab Emirates. As we know,

United Arab Emirates' main business focus on petroleum export. So, it requires a lot of labor forces. That attracts many people coming to seek a job opportunity.

### Discussion

From data visualization, we can see that the number of migrants occupies the large proportion in a small area, and the number of migrants is not necessarily large in a big area. This may be caused by several reasons, such as job, education I talked before. So what is the main factor that causing the immigration?

### Conclusion

From the line diagram, we can see that developing countries become more and more popular that people choose to immigrate.

From the boxplot, we can see that more and more people have the chance to go aboard and emigrates to other countries.

From the bar chart, we can see that United State of America is still the place that most people want to immigrate. Furthermore, we also observe that there are some countries whose citizens are all immigrants.