

# Introduction

*Introduction where you discuss the business problem and who would be interested in this project*

France is a country which tries to attract an increasing number of highly skilled migrants. Paris-the capital city-has the status of a world-city, comparatively to New York, London or Tokyo. Paris has concentrated many multinational companies, so much so that many of the high-skilled jobs in France are solely present in Paris and nowhere else in the country (trader, financial structurer, big data engineer...). As many studies have shown that skilled migrants have a higher propensity to create new, innovative businesses (even compared to the native population, let alone the low-skilled migrants), it could be a great investment for France to attract skilled migrants in regions outside of Paris in particular. The latter could help decrease regional disparities in the country, hoping for better public infrastructure to develop outside of the capital city.

The regions of France aren't well known to most foreigners outside of Europe. Here, as our data science project, we try to build a dashboard allowing to evaluate the different provinces of France, known as "département". The dashboard allows to make an informed decision regarding where is best to move, based on the following data:

- real estate prices (houses and apartments)
- average net income
- number of middle and high schools

The dashboard also provides the longitude and latitude of the "département", so one may easily find extra information online thanks to both metrics.

## Data

*Data where you describe the data that will be used to solve the problem and the source of the data*

- Average net incomes:  
<https://www.journaldunet.com/business/salaire/classement/departements/salaires>  
<https://www.journaldunet.com/business/salaire/classement/departements/salaires?page=2>  
This page presents the average net income per working person in all French "départements".
- Real estate prices:  
<https://www.consortium-immobilier.fr/prix/>  
This page presents the average price of one meter square of real estate property in all French "départements", whether that be a house or an apartment.
- Statistics on middle and high schools:  
[https://www.insee.fr/fr/statistiques/2012787#tableau-TCRD\\_061\\_tab1\\_departements](https://www.insee.fr/fr/statistiques/2012787#tableau-TCRD_061_tab1_departements)  
This page presents the number of middle schools, general and professional high schools in all French "départements", whether these schools be public or private.
- Geocoder  
We use the geocoder addon in python to get the longitudes and the latitudes of all French "départements".

## Methodology

*Methodology section which represents the main component of the report where you discuss and describe any exploratory data analysis that you did, any inferential statistical testing that you performed, if any, and what machine learnings were used and why*

- All the data from the web pages is extracted thanks to webscraping.
- The longitudes and latitudes are extracted through geocoder.
- All data is cleaned, sorted and ordered into panda dataframes.
- All overseas French "départements" are excluded through data cleaning.
- All data is presented in the alphabetical order of French "départements".

## Results

*Results section where you discuss the results*

**Figure 1 – summary table, results**

	Dpt with highest incomes	Dpt with most public middle schools	Dpt with most public professional high schools	Dpt with most public general high schools	Dpt with most private middle schools	Dpt with most private professional high schools	Dpt with most private general high schools	Dpt with most expensive houses	Dpt with most expensive apartments
0	Paris	Nord	Nord	Paris	Nord	Rhône	Paris	Savoie	Rhône
1	Hauts-de-Seine	Bouches-du-Rhône	Paris	Nord	Paris	Bouches-du-Rhône	Bouches-du-Rhône	Loire-Atlantique	Bas-Rhin
2	Yvelines	Seine-Saint-Denis	Pas-de-Calais	Seine-Saint-Denis	Rhône	Loire	Nord	Haute-Garonne	Aveyron
3	Val-de-Marne	Seine-et-Marne	Bouches-du-Rhône	Seine-et-Marne	Loire-Atlantique	Gironde	Rhône	Charente	Haute-Marne
4	Essonne	Pas-de-Calais	Rhône	Yvelines	Bouches-du-Rhône	Haute-Garonne	Loire-Atlantique	Val-d'Oise	Landes

- Paris and the Paris region offers the highest income
- Nord, Rhône and Paris have the highest number of private schools, which are usually better ranked, and offer more opportunities once applying for university programmes
- Savoie has the most expensive houses, regarding the price of a square meter
- Rhône has the most expensive apartments, regarding the price of a square meter

**Figure 2 – departments with top average net incomes**

	Department	Net income (monthly, EUR)	Longitude	Latitude
0	Paris	3683	2.341400	48.857170
1	Hauts-de-Seine	3585	2.241225	48.806163
2	Yvelines	3268	1.841223	48.815273
3	Val-de-Marne	2666	2.469195	48.777422
4	Essonne	2601	2.243431	48.522547
5	Rhône	2487	4.640873	45.871030
6	Val-d'Oise	2467	2.130822	49.082732
7	Haute-Garonne	2466	1.174886	43.358858
8	Seine-et-Marne	2430	2.934009	48.627462
9	Isère	2373	5.574199	45.263864
10	Bouches-du-Rhône	2335	5.085355	43.545473
11	Oise	2322	2.424938	49.409954
12	Alpes-Maritimes	2313	7.116190	43.938015
13	Guyane	2310	-53.233122	3.921724
14	Territoire de Belfort	2284	6.928577	47.631736
15	Gironde	2266	-0.575848	44.823894

- Besides the Paris region (Paris, Hauts-de-Seine, Yvelines, Val-de-Marne, Essonne) Rhône offers the best incomes, followed by Val-d'Oise and Haute-Garonne.

**Figure 3 – departments with highest number of private general high schools**

	Department	Public middle school	Public professional high school	Public general high school	Private middle school	Private professional high school	Private general high school	House price (EUR/m2)	Apartment price (EUR/m2)
74	Paris	114	29	71	78	12	103	1767	2043
12	Bouches-du-Rhône	136	26	39	65	27	53	2425	2107
58	Nord	203	44	56	84	16	48	1743	2499
68	Rhône	113	24	37	72	31	43	1874	1500
43	Loire-Atlantique	83	15	25	68	14	29	1518	2129
77	Yvelines	116	7	42	37	9	27	1658	2489
91	Hauts-de-Seine	99	13	40	42	6	26	2192	1606
5	Alpes-Maritimes	73	13	22	21	9	24	1792	2224
93	Val-de-Marne	105	10	37	38	9	23	2206	2307
92	Seine-Saint-Denis	130	16	51	35	8	22	1677	1869
66	Bas-Rhin	90	9	31	25	9	21	1598	1503
32	Gironde	105	23	32	33	17	21	1856	1717
28	Finistère	61	7	20	50	12	21	2220	2335
94	Val-d'Oise	111	9	36	38	3	19	1530	1729

- Rhône has the fourth supply of private general high schools.
- General high schools are the ones who prepare for intellectual careers, calling for a minimum of three years of college education—often five. A private school is preferable.

## Discussion

*Discussion section where you discuss any observations you noted and any recommendations you can make based on the results*

- Income and supply of prestigious private schools are major criteria for skilled immigrants to move to France.
- On the other hand, house and apartment prices are not as important, since most migrants rent for a number of years before owning private property. They usually aren't eligible to buy real estate as soon as they reach the territory.
- Rhône is the best region outside of Paris when it comes to the combination of both metrics. Schools in particular are of crucial importance, since good education promises for the best integration of second generation immigrants into the host society.

## Conclusion

*Conclusion section where you conclude the report*

- Investigating further the possibility of Rhône to implement efficient pro-immigration programmes—such as language programmes, along with other type of assistance—could be incredibly rewarding for the region.
- High-skilled migrants prove high integration capacity, with incredible success on the part of second and third generations. Investing in their well-being is net benefit for rich countries. It could allow a country like France to rebalance the inequalities between the Paris region and the rest of the country effectively.