

School Performance Indicators

How to optimize school performance?

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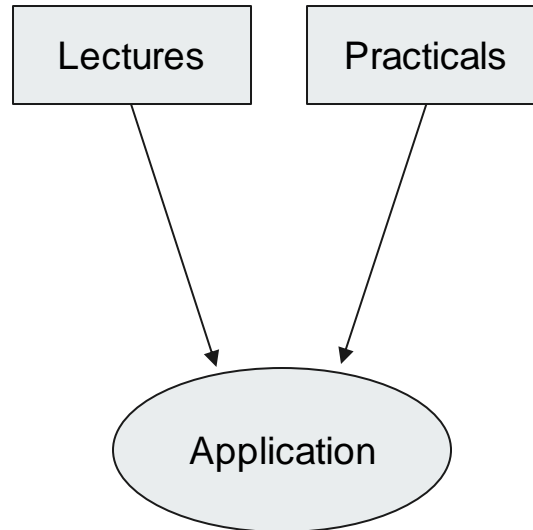
Table of content



- The project
- Our idea
- Similar research
- Data
- Knowledge
- Visualization
- Problem encountered
- What we tried and Future ideas

The project

Answer a problem that could improve something with knowledge acquired from data.



Our idea



- What we were looking for?
- Our motivation
- Our target (**OUT -> OUT**)

Similar Research

IMPRESIÓN Opinión

PISA retrata el serio problema de la educación

INFORME INTERNACIONAL

España empeora en Matemáticas y Ciencias en el primer PISA con la Lomce.

El "híking" vuelve a estar liderado por China y Singapur en ambas pruebas.

PISA 2018

La educación valenciana empeora tras cuatro años de cambios



- The Valencian results are lower than the Spanish average result.

EDUCACIÓN

¿Escuela de ricos, escuela de pobres? Cómo la concertada y la pública segregan por clase social

El análisis de todos los centros de España y la renta de sus vecindarios explica cómo la desigualdad afecta al sistema educativo

- Differences between Public and Private schools
- Socioeconomic differences are a serious problem

- Program for international student assessment
- Measure the performance of the education system
- High school level lower than ever

Data

Download external Datas from different websites

Average grade of High schools (Bachillerato)
Type of the school
Libraries in Valencia
Average income per section

datos.gob.es
reutiliza la información pública



LAS PROVINCIAS

```
df = pd.read_csv('resumen-de-actividad-2017-2018.csv', encoding = "ISO-8859-1")
```

ORDEN	COD.CENTRO	NOM.CENTRO	RELAT.	COD.TIPO	DESC.TIPO	DESC.TIPO	DIRECCION	LOCALIDAD	COD.MUN	CI	
0	2010	300047	CEPIA	PUB	P	PUBLICO	PUBLIC	DE ALCOV	519	ASOT	2
1	2010	300047	CEPIA	PUB	P	PUBLICO	PUBLIC	DE ALCOV	519	ASOT	2
2	2010	300047	CEPIA	PUB	P	PUBLICO	PUBLIC	DE ALCOV	519	ASOT	2
3	2010	300047	CEPIA	PUB	P	PUBLICO	PUBLIC	DE ALCOV	519	ASOT	2
4	2010	300047	CEPIA	PUB	P	PUBLICO	PUBLIC	DE ALCOV	519	ASOT	2

Entrée [52]:

```
df = pd.read_csv('Income_per_secciones.csv', delimiter=";", header=None, names=["CUSEC", "income"], usecols=["CUSEC", "income"], encoding = "ISO-8859-1");
```

Out[52]:

	CUSEC	income
0	4625001001	14918
1	4625001002	16789
2	4625001003	16668
3	4625001005	17188
4	4625001007	21888
...
591	4625019012	8921
592	4625019013	9306
593	4625019014	8591
594	4625019015	9883
595	4625019016	13971

596 rows x 2 columns

Out[1]:

```
df = pd.read_csv('data-hs080.csv')
```

	Instituto	Localidad	Presentados	Aptos	Media Expediente	Media PAU
0	CENTRE PRIVAT LA PURISIMA	ALZIRA	34	34	7.9	6.8
1	IES REI EN JAUME	ALZIRA	58	56	7.6	6.2
2	IES JOSÉ MARÍA FARRA	ALZIRA	39	36	7.0	5.2
3	CENTRE PRIVAT NUESTRA SEÑORA DE LA SALUD	ALGEMESI	30	30	8.2	7.1
4	IES SANT VICENT FERRER	ALGEMESI	30	30	8.0	7.1
...
457	ES L'ALLUSSE	MUTXAMEL	28	24	7.3	5.0
458	CENTRO PRIVADO SAN ALBERTO MAGNO	MONFORTE DEL CID	8	8	8.4	5.8
459	IES MARÍA BLASCO	SANT VICENT DEL RASPEIG	50	49	7.5	5.5
460	CENTRE PRIVAT EL VALLE	ALACANT	10	10	7.9	6.9
461	CENTRE PRIVAT ÀNGEL DE LA GUARDA II	ALACANT	38	38	7.8	6.2

462 rows x 6 columns

```
Out[1]:
```

	COD.PROVINCIA	NOM.PROVINCIA	COD.MUNICIPIO	TIPO	NOMBRE	DIRECCION	COD.PORTAL	TELEFONO	FAX
0	5	ALICANTE	10	AGENCIA DE LECTURA	AGENCIA DE LECTURA MAROLAN Nº 1 PISO 1	CALLE SERRA DE MAROLAN Nº 1 PISO 1	CP 03036	TELF 96510882	FAX 96510271
1	3	ALICANTE	181	BIBLIOTECA PUBLICA MUNICIPAL	BIBLIOTECA PUBLICA MUNICIPAL PEDRO SIVER	CALLE OLIVETA DE LA CREU Nº 14 PISO 1	CP 03190	TELF 965450209	FAX 965450776
2	3	ALICANTE	182	BIBLIOTECA PUBLICA MUNICIPAL	BIBLIOTECA PUBLICA MUNICIPAL PEDRO	CALLE SAN PEDRO DOMINGO Nº 1	CP 03190	TELF 965172891	FAX 965176882
3	3	ALICANTE	188	BIBLIOTECA PUBLICA MUNICIPAL	BIBLIOTECA PUBLICA MUNICIPAL PUERTA ENRIQUE MARA	PLAZA FRANCISCO LOPEZ PINO Nº 4	CP 03010	TELF 968850746	FAX 96376888
4	3	ALICANTE	188	BIBLIOTECA PUBLICA MUNICIPAL	BIBLIOTECA PUBLICA MUNICIPAL PUERTA INACIO MOLLÀ	CALLE SAN PEDRO DOMINGO Nº 1	CP 03010	TELF 968850746	FAX 96376888

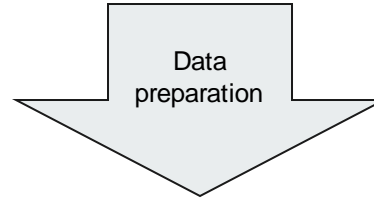
What Knowledge?

What kind of knowledge we want to extract from these datas:

1. The type of school influence the grades?
2. Having libraries close to the school influence the grades?
3. The income influence the grades?



Data



1. School grades related to its type (Public or Private)

	Instituto	Media Expediente	Media PAU	private
1	IES REI EN JAUME	7.6	6.2	False
2	IES JOSÉ MARÍA PARRA	7.0	5.2	False
3	CENTRE PRIVAT NUESTRA SEÑORA DE LA SALUD	8.2	7.1	True
4	IES SANT VICENT FERRER	8.0	7.1	False
5	IES BERNAT GUINOVART	7.4	6.4	False
6	IES FRANCESC GIL	7.9	6.7	False
7	CENTRE PRIVAT MARÍA INMACULADA	8.0	6.4	True
8	CENTRE PRIVAT SAN ANTONIO DE PADUA	7.6	5.8	True
9	IES RICARDO MARÍN IBÁÑEZ	8.0	6.8	False

2. Add geographical coordinates (google map)

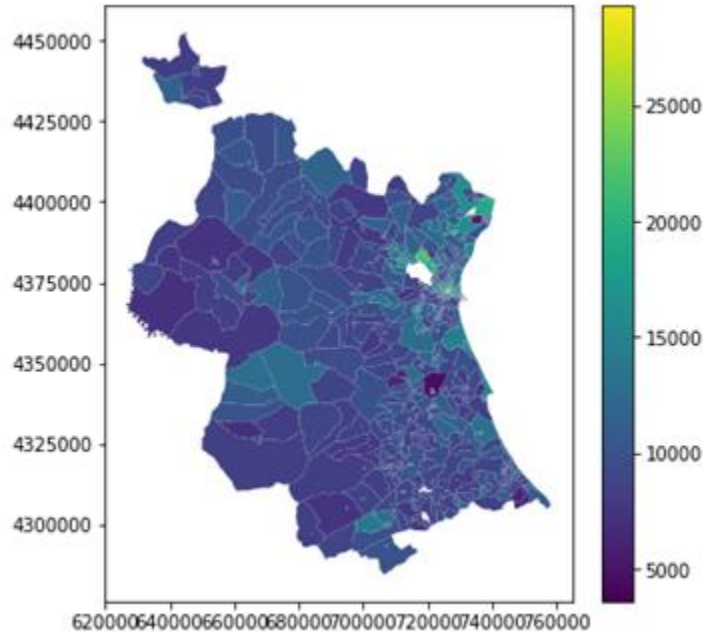
- Libraries
- Schools

Using a distance function to get the number of libraries radius of the school

	Instituto	NumBib 2 km	NumBib 5 km	NumBib 8 km	NumBib 10 km
0	CENTRE PRIVAT LA PURÍSIMA	0	3	7	7
1	IES REI EN JAUME	0	1	5	7
2	IES JOSÉ MARÍA PARRA	0	1	5	7
3	CENTRE PRIVAT NUESTRA SEÑORA DE LA SALUD	1	3	6	9
4	IES SANT VICENT FERRER	1	3	6	9
...
457	ES L'ALLUSSER	1	8	15	44
458	CENTRO PRIVADO SAN ALBERTO MAGNO	1	1	3	3

Data

Mapping and visualizing the income



Data
preparation

3. School grades related to the average income of its section

	Instituto	Media Expediente	Media PAU	income
0	CENTRE PRIVAT LA PURÍSIMA	7.9	6.6	10512.0
1	IES REI EN JAUME	7.6	6.2	9116.0
2	IES JOSÉ MARÍA PARRA	7.0	5.2	6739.0
3	CENTRE PRIVAT NUESTRA SEÑORA DE LA SALUD	8.2	7.1	4631.0
4	IES SANT VICENT FERRER	8.0	7.1	9683.0
5	IES BERNAT GUINOVART	7.4	6.4	4631.0
6	IES FRANCESC GIL	7.9	6.7	8858.0
7	CENTRE PRIVAT MARÍA INMACULADA	8.0	6.4	11698.0
8	CENTRE PRIVAT SAN ANTONIO DE PADUA	7.6	5.8	9170.0

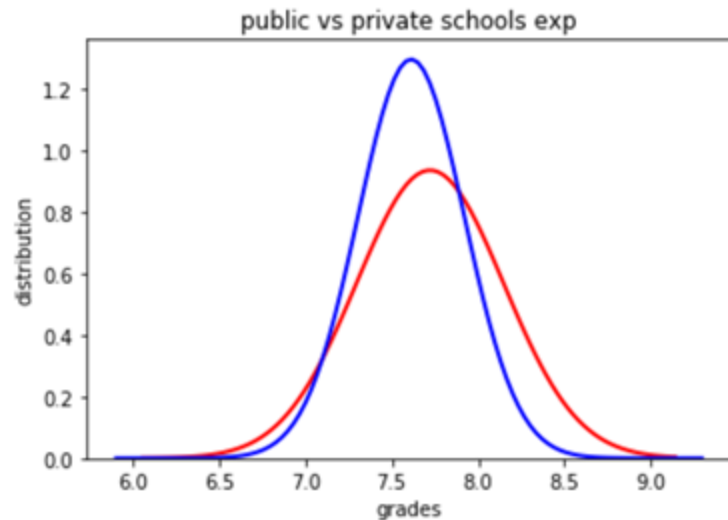
Knowledge

	Media Expediente	Media PAU	NumBib 2 km	NumBib 5 km	NumBib 8 km	NumBib 10 km	private
Media Expediente	1.000000	0.373428	-0.041423	-0.049262	-0.046825	-0.046663	0.070004
Media PAU	0.373428	1.000000	0.059806	0.072667	0.062076	0.043815	0.109077
NumBib 2 km	-0.041423	0.059806	1.000000	0.789839	0.681658	0.625300	0.235951
NumBib 5 km	-0.049262	0.072667	0.789839	1.000000	0.823699	0.755935	0.247557
NumBib 8 km	-0.046825	0.062076	0.681658	0.823699	1.000000	0.887396	0.224689
NumBib 10 km	-0.046663	0.043815	0.625300	0.755935	0.887396	1.000000	0.206015
private	0.070004	0.109077	0.235951	0.247557	0.224689	0.206015	1.000000

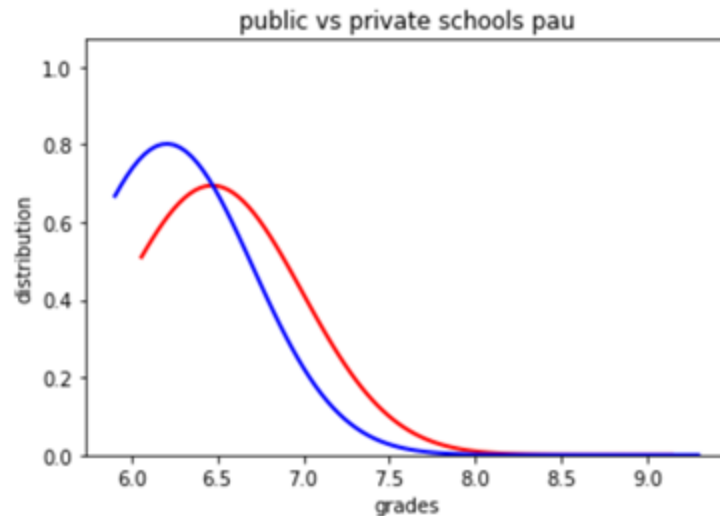
With less data -->

	Media Expediente	Media PAU	income
Media Expediente	1.000000	0.558445	0.052204
Media PAU	0.558445	1.000000	0.192983
income	0.052204	0.192983	1.000000

Knowledge



Avg public = 7.6
Avg private = 7.7



Avg public = 6.2
Avg private = 6.5

Visualization



Problems encountered



The **school system** is different compared to our countries.

It was difficult to **find data** related to education.

The information was stored in **different formats**

We were not used to working with **GeoData**.

But we overcome them!

What we tried and Future Ideas



What we tried

- We tried to built some predictive models, but without great results
- We tried to see the grades differences between the different locations

Ideas

- The map with all the schools could be a good tool for parents
- A more in-depth analysis can be made among all the schools in Spain
- A comparison can be made between the results of several years

Thank you for your attention!

