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# Criminalidade em Chicago

— Antonio Gadelha, Rafael  
Albuquerque e Rodrigo Carneiro —

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# Chicago, IL (EUA)



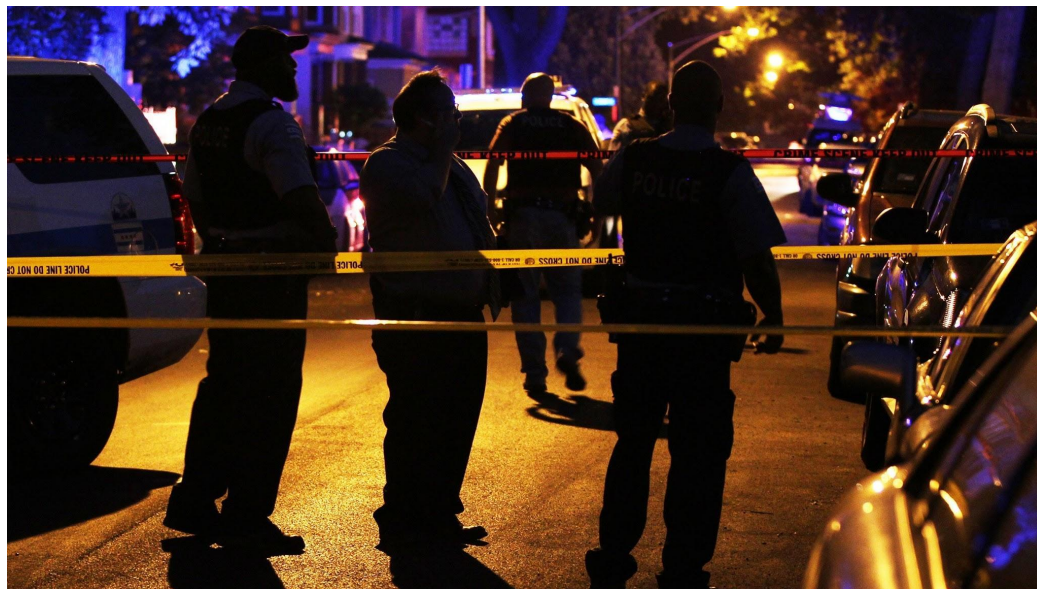
# Coleta de Dados



**CHICAGO  
DATA PORTAL**

Chicago Data Portal:

- Crimes(2001-Presente)
- Crimes(2016)
- Educação



# Pré-Processamento

- Formatar horário
- Mapear cada coordenada geográfica para uma área da cidade\
- Dentre outras coisas

Date	Primary Type	Location Description	Arrest	Domestic	Community Area	FBI Code	Location	Crime Time	Crime Day
05/03/2016 09:00:00 PM	NARCOTICS	SIDEWALK	1	0	26	18	(41.880658176, -87.731212135)	21	Tuesday
05/03/2016 09:35:00 PM	THEFT	APARTMENT	0	1	65	06	(41.77414081, -87.726307093)	21	Tuesday
05/03/2016 02:45:00 PM	ASSAULT	STREET	0	1	61	08A	(41.811697721, -87.675214316)	14	Tuesday

crimes\_upd.dtypes

Date	object
Primary Type	object
Location Description	object
Arrest	bool
Domestic	bool
Community Area	int64
FBI Code	object
Location	object
dtype: object	

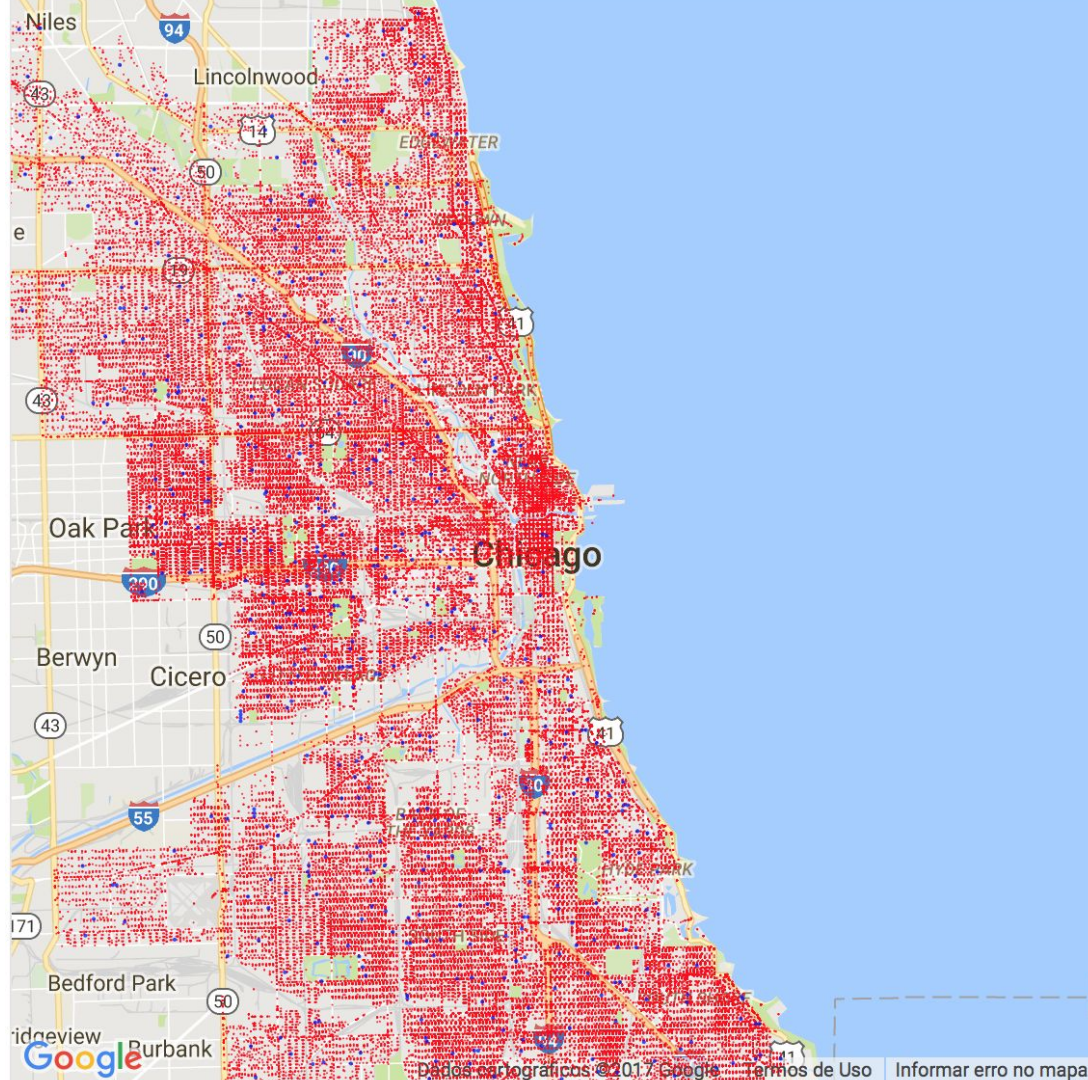
# Análise Exploratória

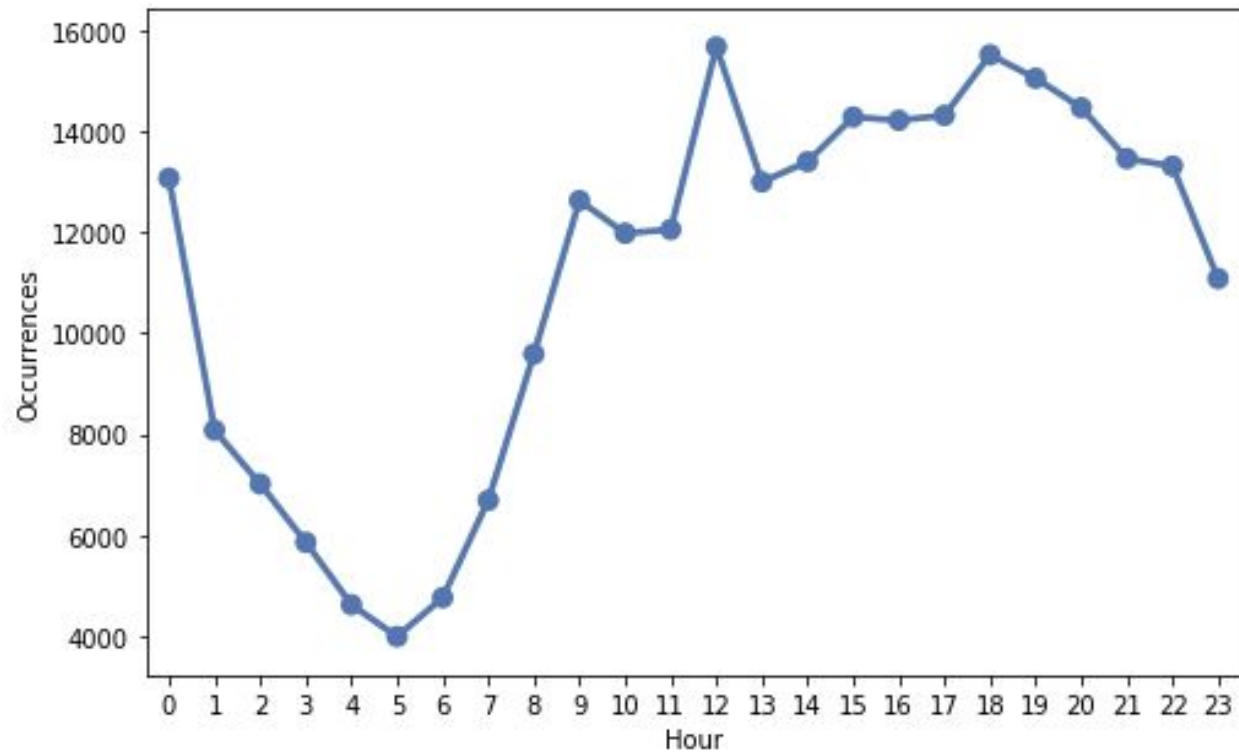
Primeiras Análises - Criminalidade em geral

- Horários com mais crimes
- Horários com mais prisões concretizadas
- Crimes mais comuns por hora
- Dentre algumas outras coisas

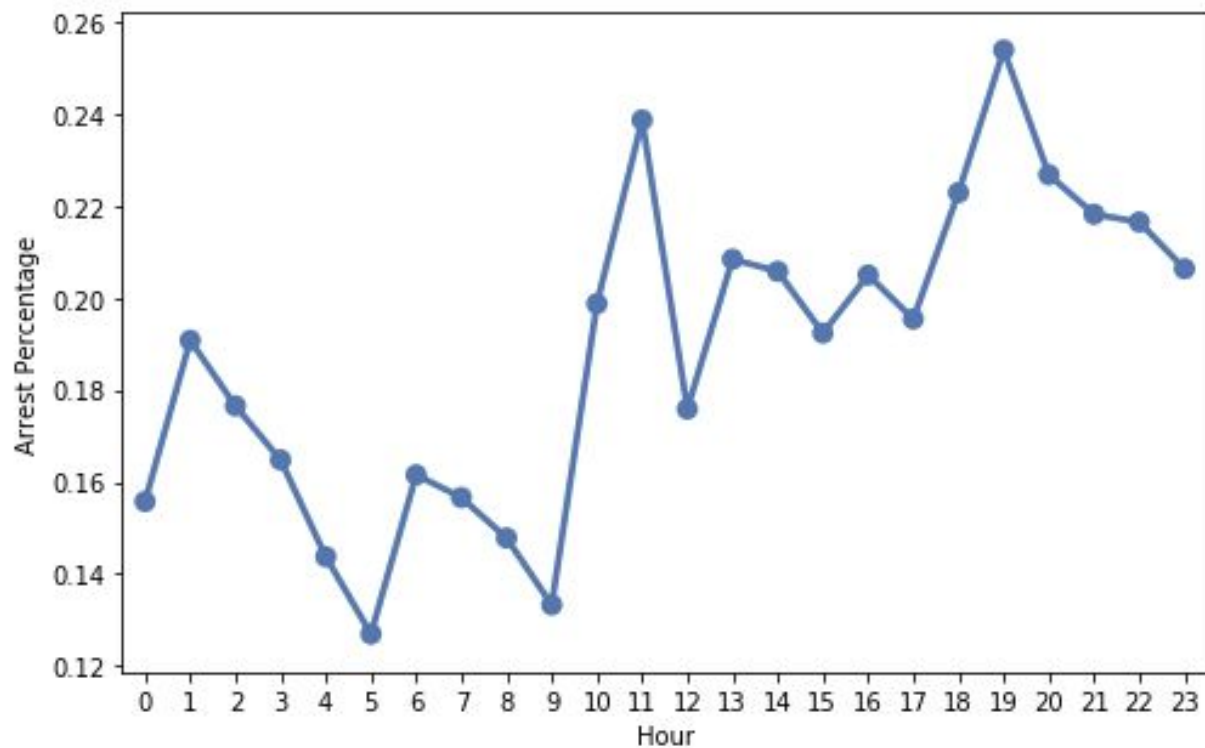


# Crimes em Chicago





Horários com mais crimes



Horários com mais prisões concretizadas



	Hour	1st Crime	1st Number	2nd Crime	2nd Number	3rd Crime	3rd Number
0	0	BATTERY	2486	THEFT	2341	CRIMINAL DAMAGE	1764
1	1	BATTERY	2264	THEFT	1445	CRIMINAL DAMAGE	1190
2	2	BATTERY	2087	THEFT	1226	CRIMINAL DAMAGE	1072
3	3	BATTERY	1696	THEFT	957	CRIMINAL DAMAGE	924
4	4	BATTERY	1300	THEFT	778	CRIMINAL DAMAGE	778
5	5	BATTERY	923	THEFT	739	CRIMINAL DAMAGE	618
6	6	THEFT	989	BATTERY	876	CRIMINAL DAMAGE	711
7	7	THEFT	1442	BATTERY	1125	CRIMINAL DAMAGE	827
8	8	THEFT	2154	BATTERY	1538	CRIMINAL DAMAGE	1050
9	9	THEFT	2633	DECEPTIVE PRACTICE	2336	BATTERY	1773
10	10	THEFT	2696	BATTERY	1845	DECEPTIVE PRACTICE	1248
11	11	THEFT	2857	BATTERY	2092	NARCOTICS	1013
12	12	THEFT	4071	DECEPTIVE PRACTICE	2307	BATTERY	2267
13	13	THEFT	3602	BATTERY	2172	DECEPTIVE PRACTICE	1078
14	14	THEFT	3901	BATTERY	2221	CRIMINAL DAMAGE	1149
15	15	THEFT	3907	BATTERY	2517	ASSAULT	1295
16	16	THEFT	3753	BATTERY	2601	CRIMINAL DAMAGE	1425
17	17	THEFT	3951	BATTERY	2457	CRIMINAL DAMAGE	1600
18	18	THEFT	4036	BATTERY	2552	CRIMINAL DAMAGE	1842
19	19	THEFT	3519	BATTERY	2546	CRIMINAL DAMAGE	1748
20	20	THEFT	3144	BATTERY	2720	CRIMINAL DAMAGE	1915
21	21	BATTERY	2712	THEFT	2695	CRIMINAL DAMAGE	1925
22	22	BATTERY	2849	THEFT	2613	CRIMINAL DAMAGE	2030
23	23	BATTERY	2656	THEFT	2100	CRIMINAL DAMAGE	1614

Crimes mais comuns por hora

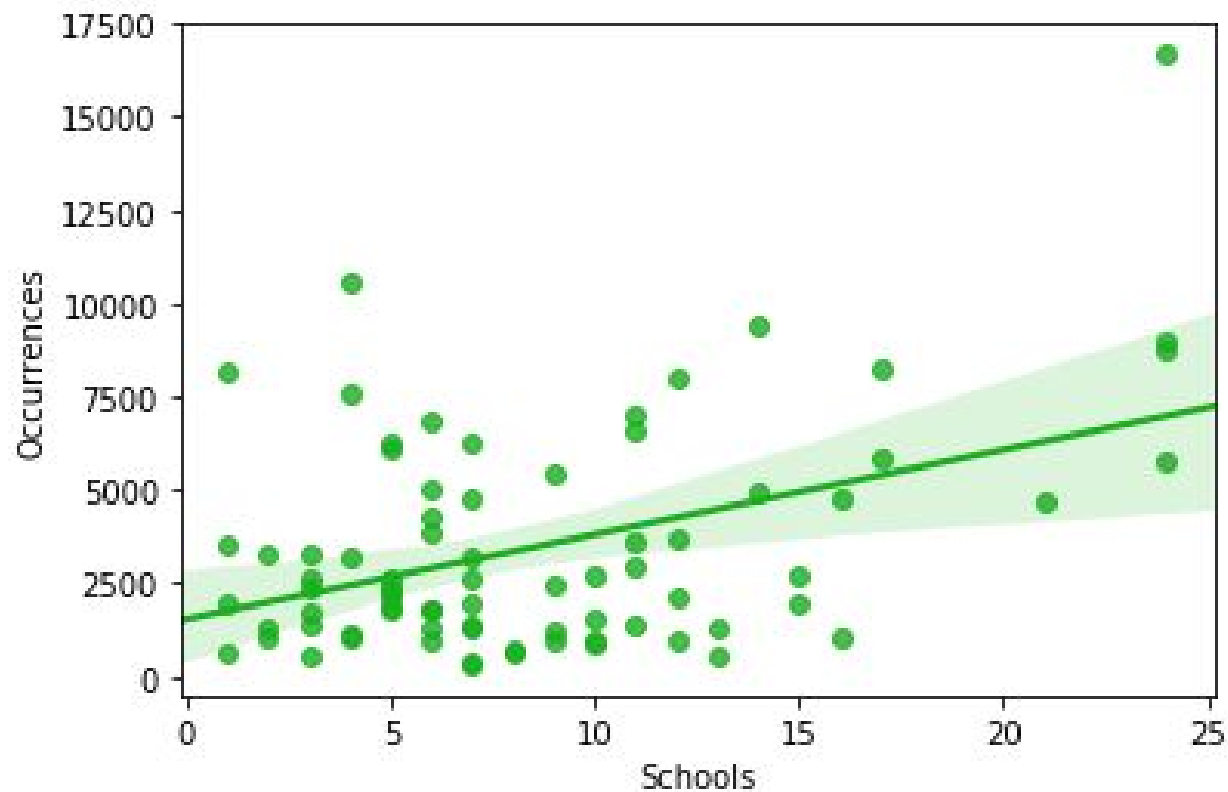
Crimes não-domésticos mais  
comuns por hora

	Hour	1st Crime	1st Number	2nd Crime	2nd Number	3rd Crime	3rd Number
0	0	THEFT	2235	DECEPTIVE PRACTICE	1676	CRIMINAL DAMAGE	1592
1	1	THEFT	1361	BATTERY	1130	CRIMINAL DAMAGE	1021
2	2	THEFT	1154	BATTERY	1023	CRIMINAL DAMAGE	927
3	3	THEFT	887	BATTERY	835	CRIMINAL DAMAGE	801
4	4	THEFT	720	CRIMINAL DAMAGE	664	BATTERY	602
5	5	THEFT	695	CRIMINAL DAMAGE	529	BATTERY	384
6	6	THEFT	931	CRIMINAL DAMAGE	625	BURGLARY	424
7	7	THEFT	1372	CRIMINAL DAMAGE	744	BURGLARY	698
8	8	THEFT	2063	CRIMINAL DAMAGE	922	DECEPTIVE PRACTICE	920
9	9	THEFT	2500	DECEPTIVE PRACTICE	2313	CRIMINAL DAMAGE	1002
10	10	THEFT	2582	DECEPTIVE PRACTICE	1237	CRIMINAL DAMAGE	954
11	11	THEFT	2762	BATTERY	1055	NARCOTICS	1013
12	12	THEFT	3946	DECEPTIVE PRACTICE	2278	BATTERY	1235
13	13	THEFT	3508	BATTERY	1232	DECEPTIVE PRACTICE	1074
14	14	THEFT	3803	BATTERY	1253	DECEPTIVE PRACTICE	1034
15	15	THEFT	3797	BATTERY	1609	CRIMINAL DAMAGE	1152
16	16	THEFT	3653	BATTERY	1525	CRIMINAL DAMAGE	1269
17	17	THEFT	3861	CRIMINAL DAMAGE	1460	BATTERY	1397
18	18	THEFT	3931	CRIMINAL DAMAGE	1695	BATTERY	1371
19	19	THEFT	3412	CRIMINAL DAMAGE	1602	BATTERY	1385
20	20	THEFT	3039	CRIMINAL DAMAGE	1770	BATTERY	1457
21	21	THEFT	2584	CRIMINAL DAMAGE	1748	BATTERY	1394
22	22	THEFT	2497	CRIMINAL DAMAGE	1842	BATTERY	1369
23	23	THEFT	2009	CRIMINAL DAMAGE	1430	BATTERY	1213

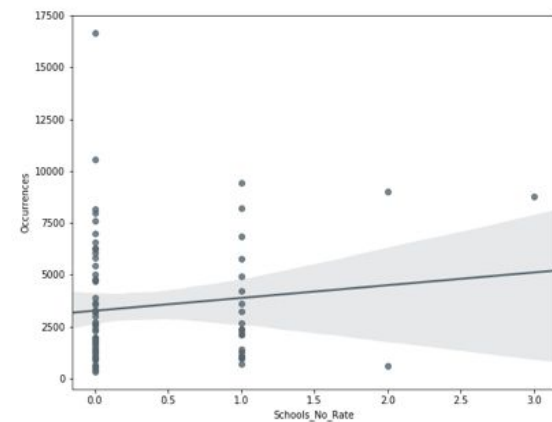
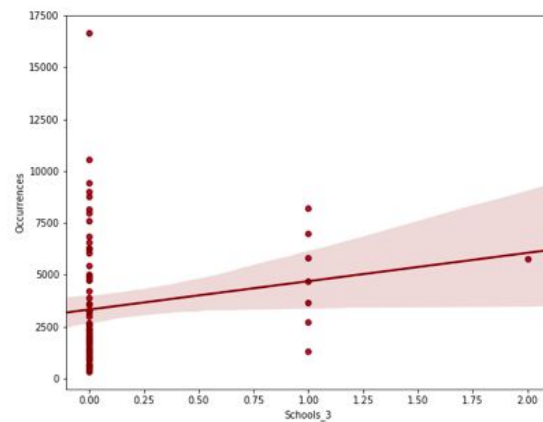
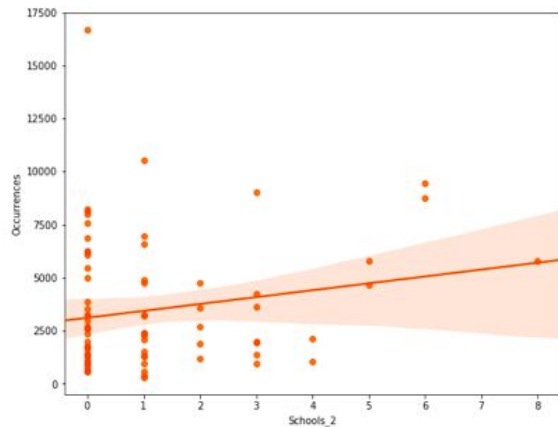
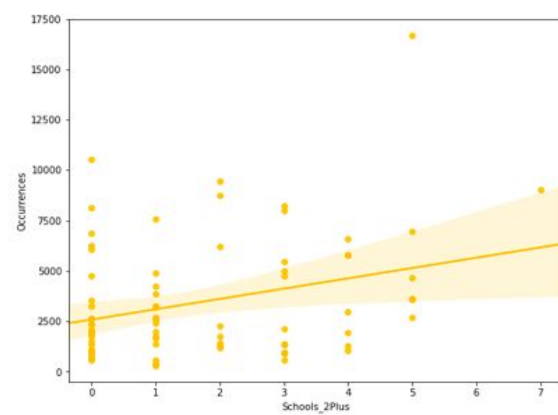
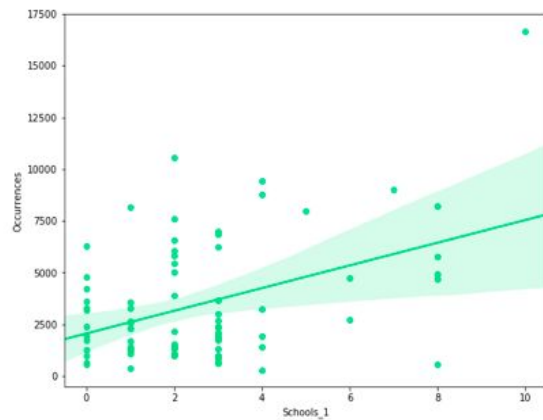
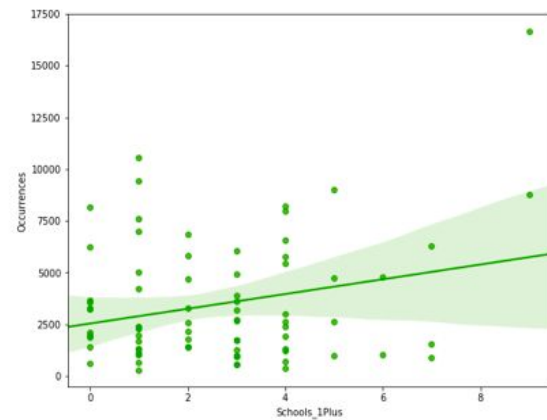
# Análise Exploratória

Influência da educação nas taxas de criminalidade da região

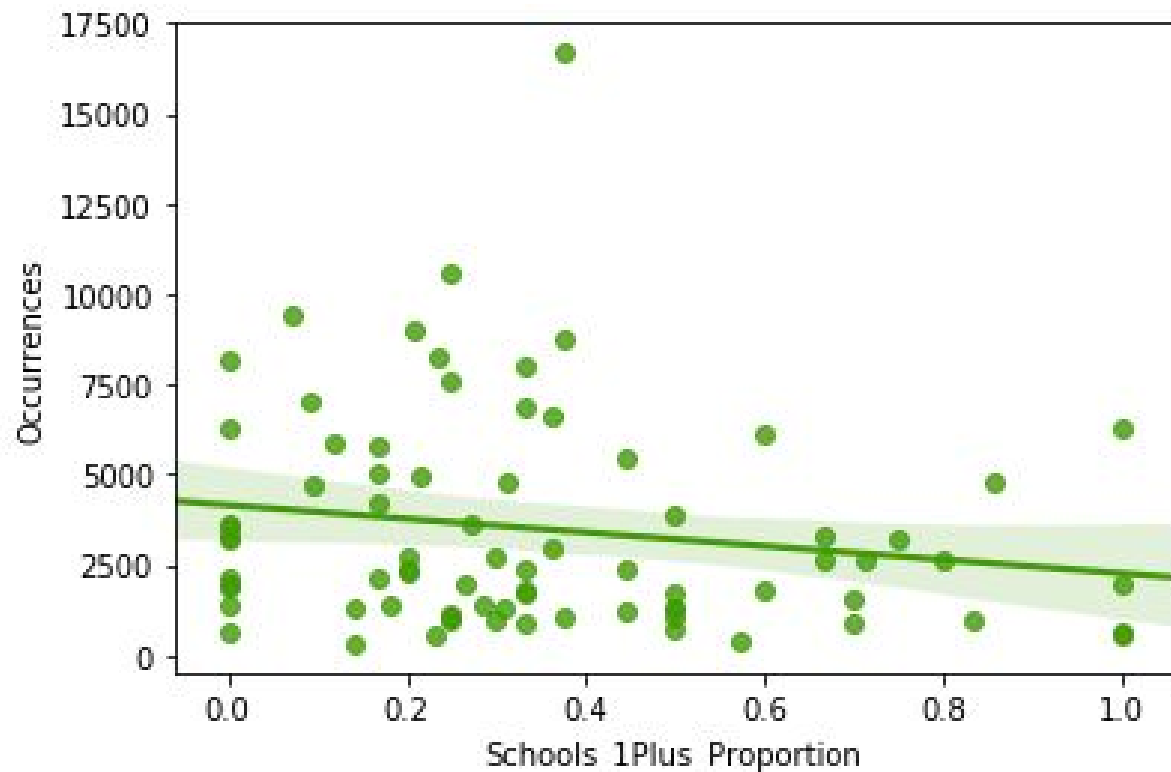
- Quanto mais escolas, menos crimes na região? Por quê?
- A quantidade de escolas de alto-nível influencia alguma coisa?



Nº de escolas X Quantidade de crimes



Nº de escolas de cada nível X Quantidade de crimes



Proporção de escolas nível 1+ X Quantidade de crimes

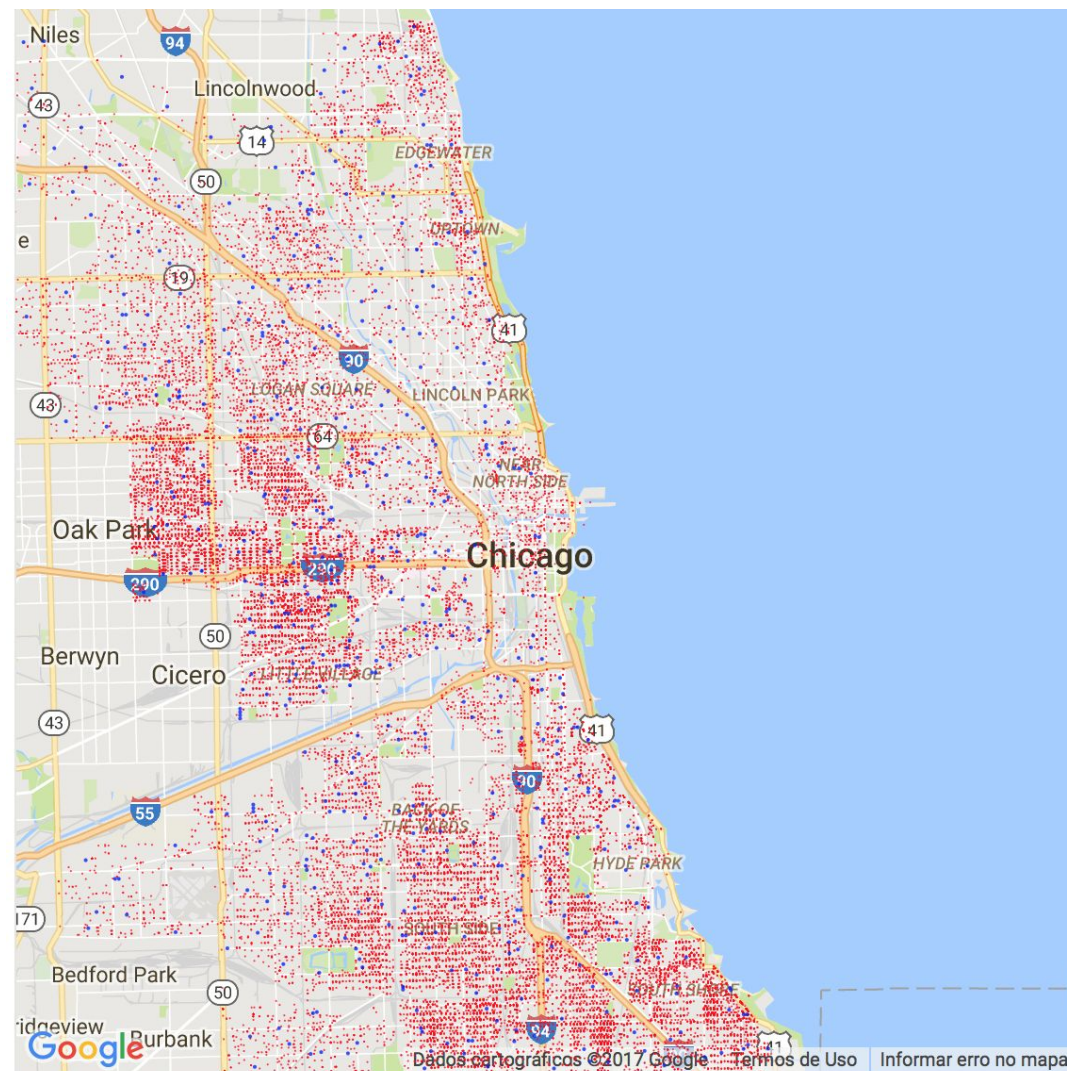


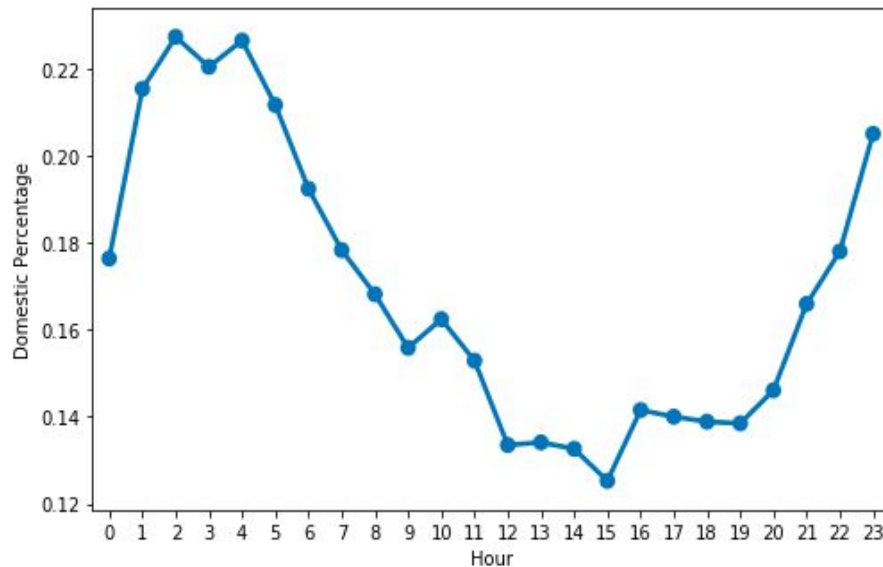
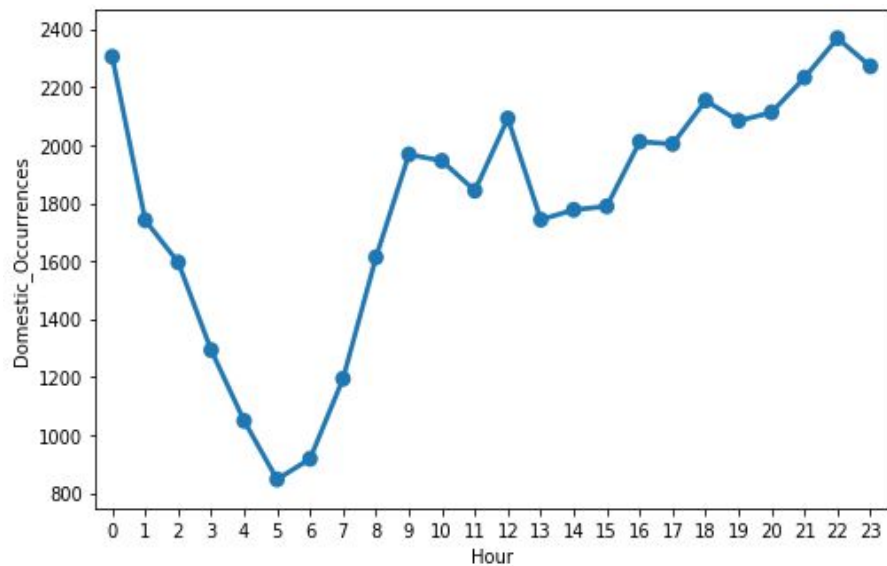
# Análise Exploratória

## Crimes domésticos

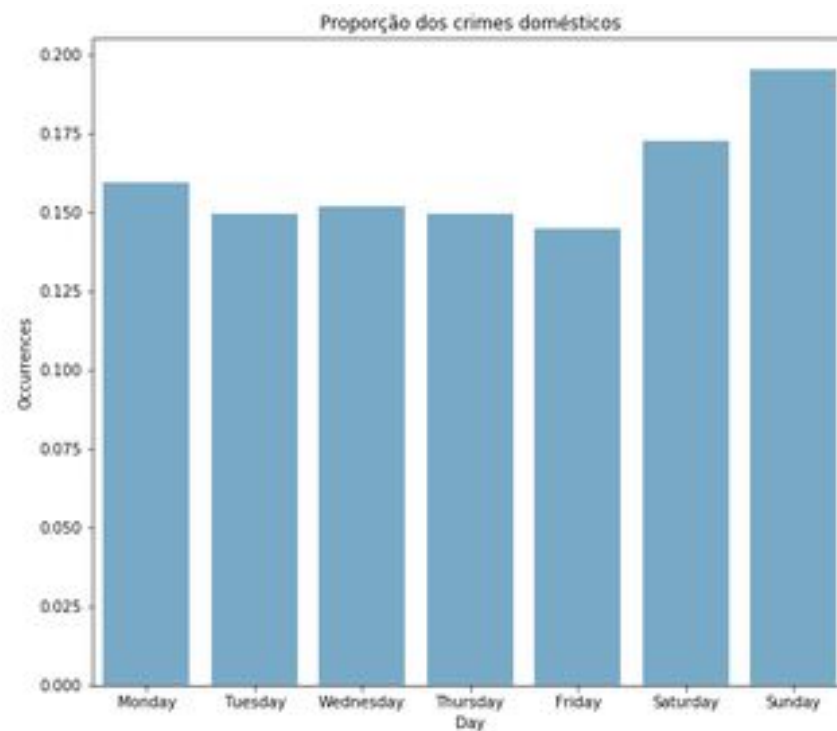
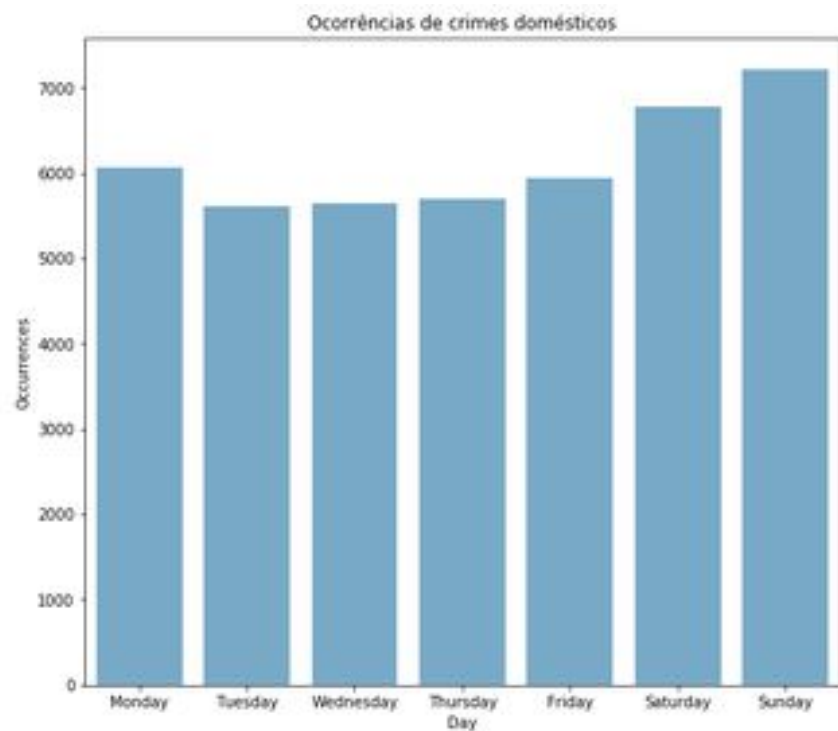
- Análises gerais
- Dias e horas com mais ocorrências
- Análises da influência da educação

# Crimes domésticos em Chicago





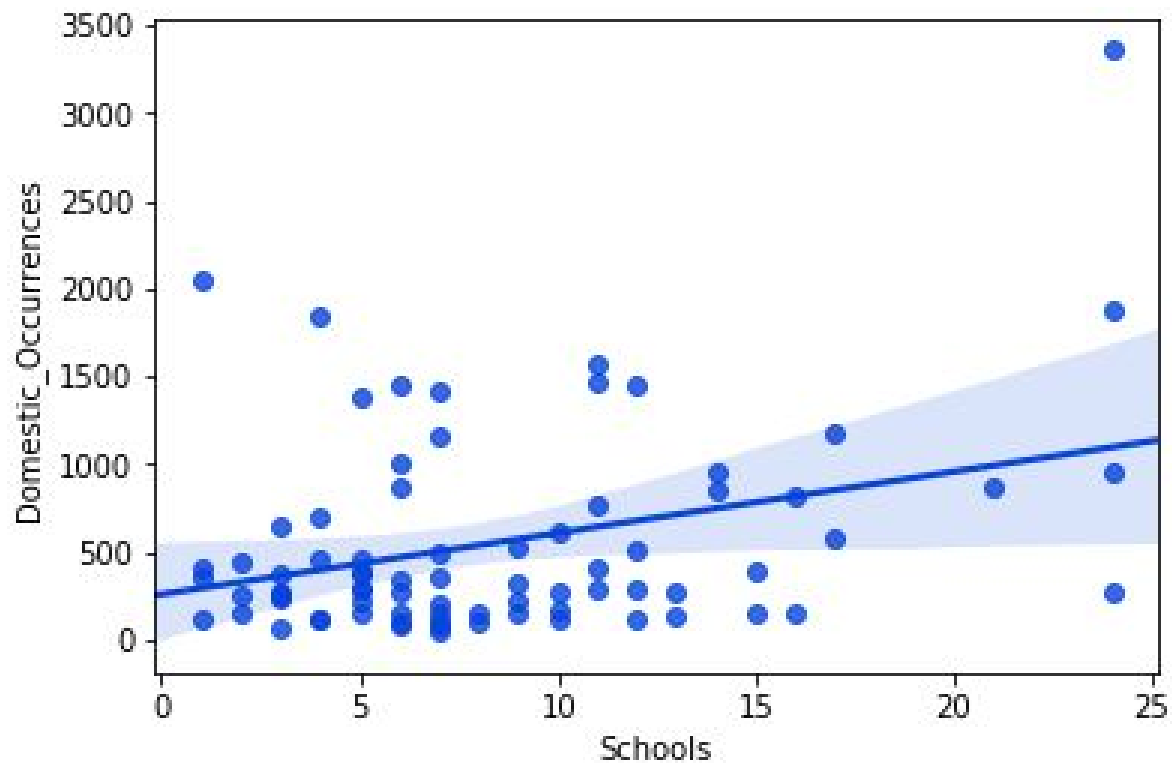
Horários com mais crimes domésticos



Dias da semana com mais crimes domésticos

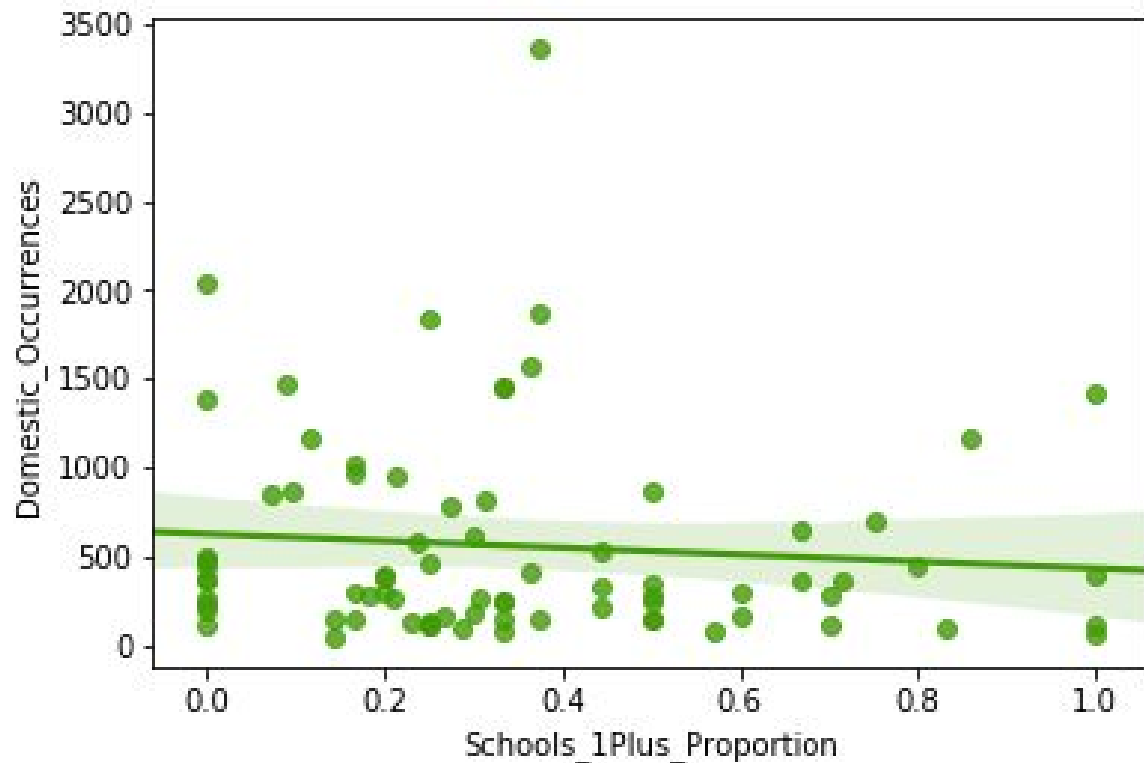
	Day	1st Crime	1st Number	2nd Crime	2nd Number	3rd Crime	3rd Number
0	Friday	BATTERY	3298	OTHER OFFENSE	772	ASSAULT	618
1	Monday	BATTERY	3348	OTHER OFFENSE	837	ASSAULT	677
2	Saturday	BATTERY	4010	OTHER OFFENSE	756	ASSAULT	694
3	Sunday	BATTERY	4358	OTHER OFFENSE	769	ASSAULT	737
4	Thursday	BATTERY	3189	OTHER OFFENSE	792	ASSAULT	637
5	Tuesday	BATTERY	3110	OTHER OFFENSE	801	ASSAULT	658
6	Wednesday	BATTERY	3101	OTHER OFFENSE	775	ASSAULT	679

Crimes domésticos mais comuns



Nº de escolas X Quantidade de crimes domésticos





Proporção de escolas nível 1+ X Quantidade de crimes domésticos

# Aprendizagem de Máquina

Classificar se dado algumas características do crime, o infrator será preso ou não

- Regressão logística
  - Analisar importância de cada variável
- Árvore de decisão para classificação
  - K-fold estratificado
  - Variação no número máximo de folhas
  - Acerto de 87% para o conjunto de teste

# Conclusões

Educação influencia na taxa de criminalidade, mas não da maneira como o grupo pensou inicialmente.

Crimes domésticos são realmente relevantes, ao ponto de influenciar diretamente nos crimes mais frequentes por hora.

Trabalhar com dados é algo bastante amplo, mas a partir do momento que existe um foco definido nas análises, o projeto flui muito bem.

# Obrigado!

Perguntas?