

# Taller 7

Métodos Computacionales para Políticas Públicas - UROSARIO

Entrega: viernes 5-oct-2018 11:59 PM

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## Instrucciones:

- Guarde una copia de este *Jupyter Notebook* en su computador, idealmente en una carpeta destinada al material del curso.
- Modifique el nombre del archivo del *notebook*, agregando al final un guión inferior y su nombre y apellido, separados estos últimos por otro guión inferior. Por ejemplo, mi *notebook* se llamaría: mcpp\_taller7\_santiago\_mataallana
- Marque el *notebook* con su nombre y e-mail en el bloque verde arriba. Reemplace el texto "[Su nombre acá]" con su nombre y apellido. Similar para su e-mail.
- Desarrolle la totalidad del taller sobre este *notebook*, insertando las celdas que sea necesario debajo de cada pregunta. Haga buen uso de las celdas para código y de las celdas tipo *markdown* según el caso.
- Recuerde salvar periódicamente sus avances.
- Cuando termine el taller:
  1. Descárguelo en PDF. Si tiene algún problema con la conversión, descárguelo en HTML.
  2. Suba todos los archivos a su repositorio en GitHub, en una carpeta destinada exclusivamente para este taller, antes de la fecha y hora límites.

(Todos los ejercicios tienen el mismo valor.)

Este taller tiene dos partes. Una obligatoria, relativamente fácil, y otra voluntaria y más retadora. Los invito a intentar desarrollar el taller en su totalidad.

En este taller exploraremos los datos de crimen de Chicago.

Descargue los datos de crimen del Chicago Data Portal solo para el año 2015 ( <https://data.cityofchicago.org/Public-Safety/Crimes-2001-to-present/ijzp-q8t2/data> ).

In [8]:

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
plt.rcParams["figure.figsize"] = [18.0, 10.0]
plt.style.use('ggplot')
```

In [9]:

```
crimes = pd.read_csv('Crimes_-_2001_to_present.csv')
```

In [10]:

```
crimes
```

Out[10]:

	ID	Case Number	Date	Block	IUCR	Primary Type	Description	Locatio
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	ID	Case Number	Date	Block	IUCR	Primary Type	Description	Location
0	10201852	HY389096	01/01/2015 12:00:00 AM	008XX N MAPLEWOOD AVE	2825	OTHER OFFENSE	HARASSMENT BY TELEPHONE	APARTMENT
1	10060114	HY239140	01/01/2015 12:00:00 AM	069XX S CORNELL AVE	1751	OFFENSE INVOLVING CHILDREN	CRIM SEX ABUSE BY FAM MEMBER	RESIDENCE
2	10210454	HY397301	01/01/2015 12:00:00 AM	049XX W WABANSIA AVE	0266	CRIM SEXUAL ASSAULT	PREDATORY	RESIDENCE
3	10025440	HY214766	01/01/2015 12:00:00 AM	004XX E 80TH ST	1154	DECEPTIVE PRACTICE	FINANCIAL IDENTITY THEFT \$300 AND UNDER	RESIDENCE
4	10225520	HY412735	01/01/2015 12:00:00 AM	075XX S BLACKSTONE AVE	1153	DECEPTIVE PRACTICE	FINANCIAL IDENTITY THEFT OVER \$ 300	RESIDENCE
5	10298217	HY486593	01/01/2015 12:00:00 AM	013XX S THROOP ST	1752	OFFENSE INVOLVING CHILDREN	AGG CRIM SEX ABUSE FAM MEMBER	STREET
6	10251294	HY438848	01/01/2015 12:00:00 AM	030XX W VAN BUREN ST	1562	SEX OFFENSE	AGG CRIMINAL SEXUAL ABUSE	RESIDENCE
7	10348954	HY539840	01/01/2015 12:00:00 AM	026XX W AGATITE AVE	1752	OFFENSE INVOLVING CHILDREN	AGG CRIM SEX ABUSE FAM MEMBER	RESIDENCE
8	10249793	HY437344	01/01/2015 12:00:00 AM	078XX S MERRILL AVE	0266	CRIM SEXUAL ASSAULT	PREDATORY	RESIDENCE
9	10055136	HY244136	01/01/2015 12:00:00 AM	105XX S LAFAYETTE AVE	1544	SEX OFFENSE	SEXUAL EXPLOITATION OF A CHILD	RESIDENCE
10	10225760	HY412902	01/01/2015 12:00:00 AM	050XX N MARINE DR	0810	THEFT	OVER \$500	APARTMENT
11	9963311	HY152624	01/01/2015 12:00:00 AM	054XX S INDIANA AVE	1710	OFFENSE INVOLVING CHILDREN	ENDANGERING LIFE/HEALTH CHILD	APARTMENT
12	9911347	HY100371	01/01/2015 12:00:00 AM	032XX S ABERDEEN ST	2825	OTHER OFFENSE	HARASSMENT BY TELEPHONE	RESIDENCE
13	10357502	HY548591	01/01/2015 12:00:00 AM	059XX W GUNNISON ST	1544	SEX OFFENSE	SEXUAL EXPLOITATION OF A CHILD	RESIDENCE
14	9919306	HY108256	01/01/2015 12:00:00 AM	032XX S WALLACE ST	1150	DECEPTIVE PRACTICE	CREDIT CARD FRAUD	APARTMENT
15	10069755	HY258329	01/01/2015 12:00:00 AM	015XX N KEYSTONE AVE	1752	OFFENSE INVOLVING CHILDREN	AGG CRIM SEX ABUSE FAM MEMBER	RESIDENCE
16	10210466	HY397304	01/01/2015 12:00:00 AM	010XX W BELMONT AVE	1751	OFFENSE INVOLVING CHILDREN	CRIM SEX ABUSE BY FAM MEMBER	RESIDENCE
17	10274300	HY462262	01/01/2015 12:00:00 AM	018XX N CALIFORNIA AVE	1153	DECEPTIVE PRACTICE	FINANCIAL IDENTITY THEFT OVER \$ 300	APARTMENT
18	10392715	HZ129023	01/01/2015 12:00:00 AM	074XX S YATES BLVD	1544	SEX OFFENSE	SEXUAL EXPLOITATION OF A CHILD	RESIDENCE

	ID	Case Number	Date	Block	IUCR	Primary Type	Description	Location
19	10136559	HY325033	01/01/2015 12:00:00 AM	043XX S WESTERN AVE	1752	OFFENSE INVOLVING CHILDREN	AGG CRIM SEX ABUSE FAM MEMBER	APARTMENT
20	9927080	HY115682	01/01/2015 12:00:00 AM	030XX W ARTHINGTON ST	1310	CRIMINAL DAMAGE	TO PROPERTY	APARTMENT
21	10024172	HY212630	01/01/2015 12:00:00 AM	078XX S MAY ST	1753	OFFENSE INVOLVING CHILDREN	SEX ASSLT OF CHILD BY FAM MBR	RESIDENCE
22	10262792	HY450465	01/01/2015 12:00:00 AM	077XX S DR MARTIN LUTHER KING JR DR	1154	DECEPTIVE PRACTICE	FINANCIAL IDENTITY THEFT \$300 AND UNDER	RESIDENCE
23	10045724	HY234319	01/01/2015 12:00:00 AM	035XX W 57TH ST	1544	SEX OFFENSE	SEXUAL EXPLOITATION OF A CHILD	RESIDENCE
24	10229179	HY416572	01/01/2015 12:00:00 AM	039XX S LAKE PARK AVE	1752	OFFENSE INVOLVING CHILDREN	AGG CRIM SEX ABUSE FAM MEMBER	RESIDENCE
25	10061132	HY248693	01/01/2015 12:00:00 AM	025XX W MARQUETTE RD	1751	OFFENSE INVOLVING CHILDREN	CRIM SEX ABUSE BY FAM MEMBER	APARTMENT
26	10231909	HY419527	01/01/2015 12:00:00 AM	047XX S CHAMPLAIN AVE	1752	OFFENSE INVOLVING CHILDREN	AGG CRIM SEX ABUSE FAM MEMBER	RESIDENCE
27	10062543	HY250678	01/01/2015 12:00:00 AM	047XX S WINCHESTER AVE	1752	OFFENSE INVOLVING CHILDREN	AGG CRIM SEX ABUSE FAM MEMBER	RESIDENCE
28	10272078	HY460276	01/01/2015 12:00:00 AM	058XX N MULLIGAN AVE	0266	CRIM SEXUAL ASSAULT	PREDATORY	RESIDENCE
29	10328772	HY519557	01/01/2015 12:00:00 AM	037XX N RICHMOND ST	1582	OFFENSE INVOLVING CHILDREN	CHILD PORNOGRAPHY	RESIDENCE
...	...	...	...	...	...	...	...	...
258483	10363662	HY555590	12/30/2015 10:40:00 PM	047XX W FULLERTON AVE	4625	OTHER OFFENSE	PAROLE VIOLATION	STREET
258484	10363677	HY555608	12/30/2015 10:45:00 PM	0000X E OHIO ST	0486	BATTERY	DOMESTIC BATTERY SIMPLE	HOTEL/MOTEL
258485	10363810	HY555732	12/30/2015 10:45:00 PM	003XX W 95TH ST	2024	NARCOTICS	POSS: HEROIN(WHITE)	STREET
258486	10363793	HY555679	12/30/2015 10:45:00 PM	026XX N WESTERN AVE	0810	THEFT	OVER \$500	PARKING LOT/GARAGE
258487	10363746	HY555592	12/30/2015 10:50:00 PM	065XX N GLENWOOD AVE	0520	ASSAULT	AGGRAVATED:KNIFE/CUTTING INSTR	APARTMENT
258488	10363693	HY555619	12/30/2015 10:52:00 PM	030XX S ST LOUIS AVE	0610	BURGLARY	FORCIBLE ENTRY	APARTMENT
258489	10378523	HZ114024	12/30/2015 11:00:00 PM	015XX N MASSASOIT AVE	0820	THEFT	\$500 AND UNDER	STREET

<b>258490</b>	<b>ID</b>	<b>Case</b>	<b>12/30/2015</b>	<b>018XX W</b>	<b>Block</b>	<b>UCR</b>	<b>Primary</b>	<b>Description</b>	<b>Location</b>
	10363695	HY555597	11:00:00 PM	58TH ST		0486	BATTERY	DOMESTIC BATTERY SIMPLE	RESIDENCE
<b>258491</b>	10363709	HY555639	12/30/2015 11:00:00 PM	067XX S CHAPPEL AVE		0486	BATTERY	DOMESTIC BATTERY SIMPLE	RESIDENCE
<b>258492</b>	10367554	HZ103637	12/30/2015 11:00:00 PM	071XX S ST LAWRENCE AVE		0486	BATTERY	DOMESTIC BATTERY SIMPLE	APARTMENT
<b>258493</b>	10363779	HY555603	12/30/2015 11:00:00 PM	031XX W 41ST PL		0560	ASSAULT	SIMPLE	RESIDENCE
<b>258494</b>	10364041	HY555807	12/30/2015 11:00:00 PM	022XX W MONROE ST		0486	BATTERY	DOMESTIC BATTERY SIMPLE	APARTMENT
<b>258495</b>	10364525	HY556481	12/30/2015 11:00:00 PM	052XX S KNOX AVE		1310	CRIMINAL DAMAGE	TO PROPERTY	RESIDENCE
<b>258496</b>	10363682	HY555617	12/30/2015 11:00:00 PM	054XX N EAST RIVER RD		2826	OTHER OFFENSE	HARASSMENT BY ELECTRONIC MEANS	RESIDENCE
<b>258497</b>	10363673	HY555598	12/30/2015 11:01:00 PM	028XX W 21ST ST		143A	WEAPONS VIOLATION	UNLAWFUL POSS OF HANDGUN	RESIDENTIAL (FRONT/BACK)
<b>258498</b>	10363749	HY555601	12/30/2015 11:02:00 PM	073XX S WINCHESTER AVE		0486	BATTERY	DOMESTIC BATTERY SIMPLE	APARTMENT
<b>258499</b>	10364177	HY555596	12/30/2015 11:05:00 PM	061XX N LINCOLN AVE		0610	BURGLARY	FORCIBLE ENTRY	COMMERCIAL OFFICE
<b>258500</b>	10363698	HY555606	12/30/2015 11:05:00 PM	035XX N BROADWAY		0860	THEFT	RETAIL THEFT	GROCERY FO
<b>258501</b>	10363724	HY555616	12/30/2015 11:10:00 PM	116XX S VINCENNES AVE		0460	BATTERY	SIMPLE	STREET
<b>258502</b>	10363719	HY555612	12/30/2015 11:12:00 PM	019XX W MAYPOLE AVE		0420	BATTERY	AGGRAVATED:KNIFE/CUTTING INSTR	CHA APARTM
<b>258503</b>	10363802	HY555626	12/30/2015 11:30:00 PM	005XX S WESTERN AVE		0870	THEFT	POCKET-PICKING	CTA TRAIN
<b>258504</b>	10363732	HY555640	12/30/2015 11:40:00 PM	016XX E 69TH ST		0560	ASSAULT	SIMPLE	APARTMENT
<b>258505</b>	10363712	HY555653	12/30/2015 11:40:00 PM	054XX S LEAVITT ST		1330	CRIMINAL TRESPASS	TO LAND	OTHER RAILR TRAIN DEPOT
<b>258506</b>	10363707	HY555620	12/30/2015 11:45:00 PM	076XX S PHILLIPS AVE		0560	ASSAULT	SIMPLE	APARTMENT
<b>258507</b>	10363808	HY555622	12/30/2015 11:47:00 PM	085XX S SANGAMON ST		0486	BATTERY	DOMESTIC BATTERY SIMPLE	RESIDENCE
<b>258508</b>	10369351	HZ105321	12/31/2015 12:00:00 AM	0000X W RANDOLPH ST		1150	DECEPTIVE PRACTICE	CREDIT CARD FRAUD	OTHER

	ID	Case Number	Date	Block	UCR	Primary Type	Description	Location
258509	10365050	HZ106801	12/31/2015 12:00:00 AM	038XX N FREMONT ST	0890	THEFT	FROM BUILDING	RESIDENTIAL PORCH/HALL
258510	10364335	HY556149	12/31/2015 12:00:00 AM	037XX W ARGYLE ST	1320	CRIMINAL DAMAGE	TO VEHICLE	STREET
258511	10371800	HZ106801	12/31/2015 12:00:00 AM	019XX N Hoyne Ave	1153	DECEPTIVE PRACTICE	FINANCIAL IDENTITY THEFT OVER \$ 300	NaN
258512	10364402	HY556328	12/31/2015 12:00:00 AM	051XX S BLACKSTONE AVE	0810	THEFT	OVER \$500	STREET

258513 rows × 22 columns

Parte obligatoria

1.

Calcule el número de crímenes en cada Community Area en 2015. Haga un gráfico de barras que lo ilustre.

```
In [11]:
crimes_by_community = crimes.groupby("Community Area")

In [12]:
community_crime_count = crimes_by_community['ID'].agg('count')
community_crime_count
community_crime_count.to_frame()
```

Out[12]:

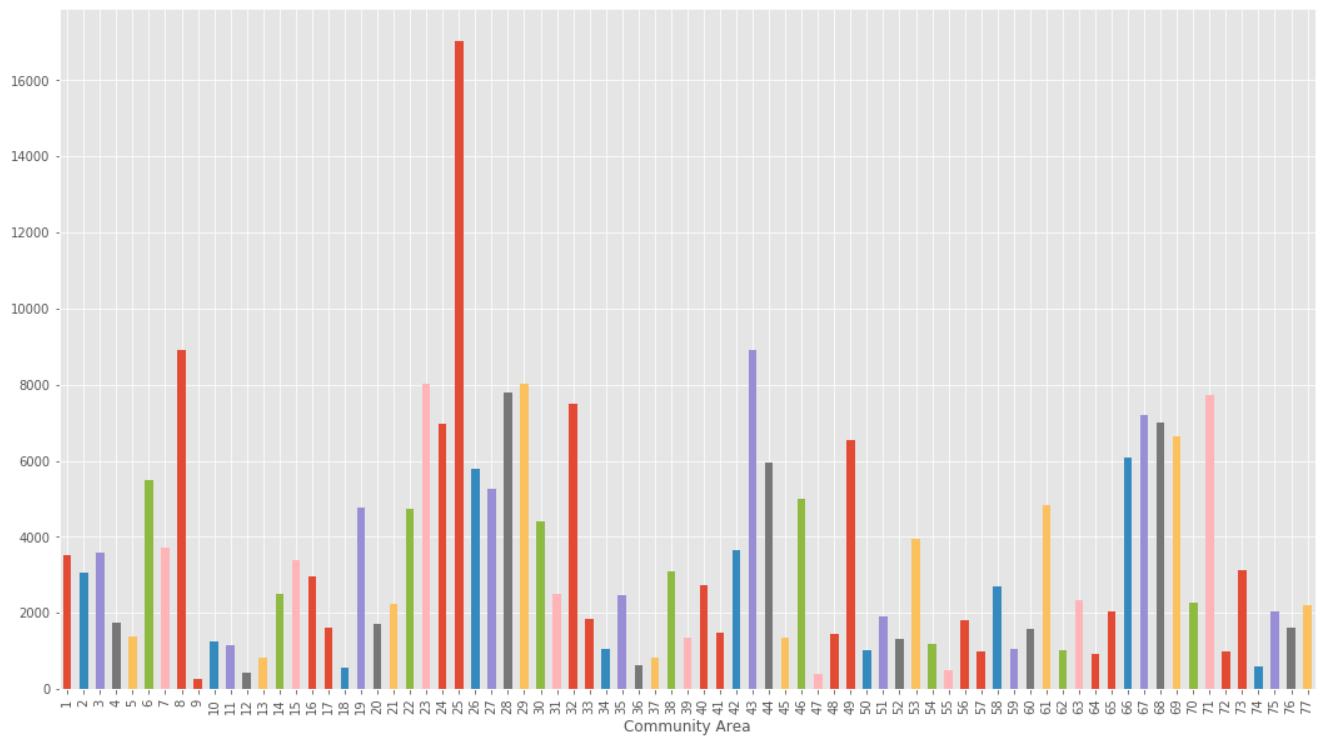
	ID
Community Area	
1	3519
2	3059
3	3585
4	1747
5	1375
6	5495
7	3726
8	8920
9	254
10	1259
11	1140
12	444
13	828
14	2501
15	3392
16	2960
17	1626
18	572

19	4769
Community Area	1703
21	2232
22	4737
23	8015
24	6959
25	17020
26	5794
27	5270
28	7788
29	8039
30	4393
...	...
48	1458
49	6545
50	1037
51	1900
52	1303
53	3949
54	1173
55	506
56	1796
57	986
58	2706
59	1063
60	1590
61	4842
62	1030
63	2334
64	927
65	2027
66	6081
67	7203
68	6991
69	6653
70	2279
71	7733
72	976
73	3109
74	608
75	2052
76	1622
77	2209

77 rows × 1 columns

```
In [18]:
```

```
community_crime_count.plot(kind='bar');
```



## 2.

Ordene las Community Areas de acuerdo con el número de crímenes. ¿Qué Community Area (por nombre, idealmente) presenta el mayor número de crímenes? ¿El menor?

```
In [14]:
```

```
community_crime_count.sort_values()
```

```
Out[14]:
```

```
Community Area
9            254
47           380
12           444
55           506
18           572
74           608
36           622
13           828
37           834
64           927
72           976
57          986
62         1030
50         1037
34         1057
59         1063
11         1140
54         1173
10         1259
52         1303
39         1340
45         1356
5          1375
48         1458
41         1493
60         1590
76         1622
17         1626
20         1703
4          1747
```

```

...
73 3109
15 3392
1 3519
3 3585
42 3665
7 3726
53 3949
30 4393
22 4737
19 4769
61 4842
46 5009
27 5270
6 5495
26 5794
44 5943
66 6081
49 6545
69 6653
24 6959
68 6991
67 7203
32 7489
71 7733
28 7788
23 8015
29 8039
43 8906
8 8920
25 17020
Name: ID, Length: 77, dtype: int64

```

### 3.

Cree una tabla cuyas filas sean días del año (yyyy-mm-dd) y las columnas las 77 Community Areas. En cada campo de la tabla deberá haber el correspondiente número de crímenes. Seleccione algunas Community Areas que le llamen la atención y haga un gráfico de serie de tiempo.

Pista: El siguiente código puede serle útil.

In [21]:

```

# Create function to strip time from date field, and use it to create another column
def to_day(timestamp):
    timestamp = pd.to_datetime(timestamp)
    return timestamp.replace(minute=0, hour=0, second=0)

crimes['Day'] = crimes['Date'].apply(to_day)

```

In [24]:

```

crimes_by_community_day = crimes.groupby(['Community Area', 'Day'])
crimes_by_community_day
crimes_by_community_day_count = crimes_by_community_day['ID'].agg('count')
crimes_by_community_day_count
community_timeseries = crimes_by_community_day_count.unstack('Community Area')
community_timeseries

```

Out[24]:

Community Area	1	2	3	4	5	6	7	8	9	10	...	68	69	70	71	72	73	74	75	76	7
Day																					
2015-01-01	13.0	7.0	11.0	4.0	5.0	22.0	12.0	43.0	1.0	5.0	...	29.0	23.0	9.0	44.0	2.0	8.0	2.0	5.0	6.0	8.0
2015-01-02	5.0	9.0	8.0	3.0	2.0	10.0	9.0	27.0	NaN	2.0	...	12.0	21.0	5.0	17.0	1.0	11.0	1.0	2.0	6.0	5.0
2015-01-03	7.0	11.0	9.0	7.0	4.0	6.0	11.0	27.0	1.0	3.0	...	23.0	12.0	8.0	18.0	NaN	8.0	1.0	7.0	3.0	3.0
2015-01-04	12.0	7.0	9.0	10.0	3.0	15.0	5.0	16.0	1.0	4.0	...	13.0	15.0	9.0	12.0	1.0	5.0	NaN	1.0	6.0	1.0



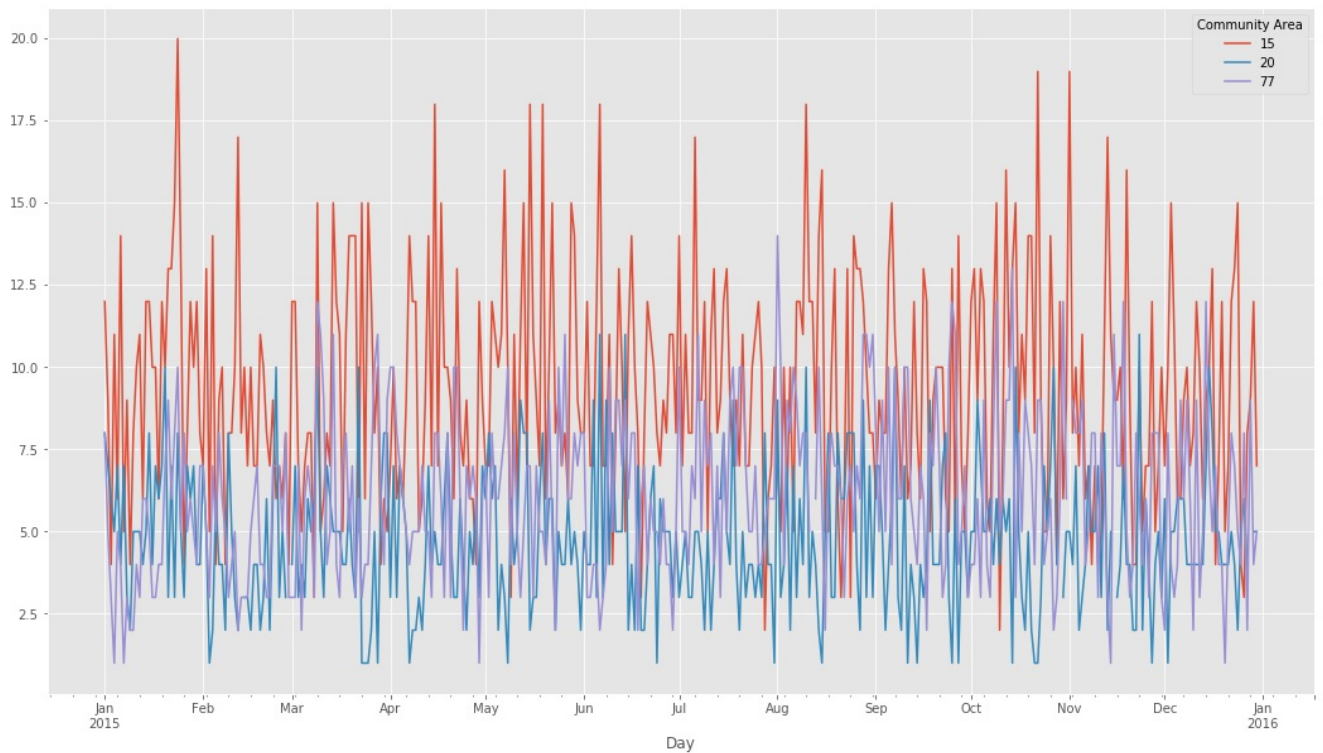
Community Area	6.01	7.02	5.03	4.04	5.05	15.06	7.07	11.08	1.09	3.00	...	16.01	12.02	8.03	17.04	NaN	5.05	2.06	2.05	7.06	5.07
2015-01-06 Day	7.0	8.0	6.0	5.0	NaN	13.0	7.0	13.0	NaN	4.0	...	15.0	14.0	6.0	11.0	2.0	8.0	2.0	3.0	6.0	4.0
2015-01-07	6.0	2.0	4.0	5.0	1.0	8.0	6.0	17.0	1.0	2.0	...	11.0	7.0	4.0	16.0	3.0	7.0	NaN	3.0	7.0	1.0
2015-01-08	6.0	6.0	3.0	5.0	NaN	6.0	5.0	8.0	1.0	NaN	...	9.0	9.0	6.0	10.0	2.0	4.0	1.0	5.0	3.0	3.0
2015-01-09	10.0	5.0	10.0	2.0	4.0	14.0	6.0	21.0	NaN	3.0	...	18.0	14.0	10.0	20.0	1.0	9.0	2.0	8.0	5.0	2.0
2015-01-10	6.0	12.0	8.0	NaN	1.0	10.0	5.0	24.0	2.0	2.0	...	9.0	13.0	6.0	28.0	3.0	3.0	1.0	5.0	5.0	2.0
2015-01-11	8.0	6.0	11.0	5.0	4.0	20.0	4.0	26.0	1.0	2.0	...	17.0	8.0	11.0	17.0	2.0	10.0	2.0	4.0	2.0	4.0
2015-01-12	3.0	6.0	6.0	6.0	1.0	7.0	11.0	17.0	NaN	6.0	...	12.0	18.0	6.0	19.0	3.0	5.0	1.0	4.0	4.0	3.0
2015-01-13	10.0	10.0	9.0	5.0	4.0	8.0	6.0	15.0	NaN	3.0	...	19.0	12.0	9.0	11.0	2.0	6.0	NaN	4.0	6.0	6.0
2015-01-14	17.0	8.0	9.0	4.0	3.0	5.0	11.0	15.0	1.0	3.0	...	21.0	16.0	6.0	24.0	NaN	5.0	1.0	1.0	2.0	6.0
2015-01-15	9.0	8.0	8.0	6.0	7.0	9.0	11.0	18.0	1.0	4.0	...	19.0	20.0	4.0	21.0	3.0	7.0	2.0	6.0	6.0	5.0
2015-01-16	13.0	6.0	12.0	5.0	5.0	12.0	12.0	22.0	1.0	8.0	...	18.0	17.0	8.0	16.0	4.0	5.0	NaN	5.0	7.0	3.0
2015-01-17	12.0	5.0	5.0	2.0	5.0	16.0	7.0	30.0	1.0	4.0	...	29.0	13.0	7.0	15.0	2.0	6.0	2.0	5.0	10.0	3.0
2015-01-18	12.0	6.0	12.0	7.0	5.0	14.0	8.0	18.0	1.0	2.0	...	20.0	22.0	3.0	20.0	1.0	11.0	NaN	8.0	2.0	4.0
2015-01-19	3.0	12.0	7.0	3.0	5.0	10.0	11.0	25.0	NaN	3.0	...	24.0	19.0	3.0	28.0	NaN	13.0	NaN	6.0	8.0	4.0
2015-01-20	8.0	8.0	9.0	10.0	3.0	13.0	12.0	31.0	NaN	4.0	...	19.0	15.0	5.0	23.0	1.0	10.0	NaN	8.0	6.0	7.0
2015-01-21	18.0	8.0	8.0	10.0	9.0	12.0	9.0	29.0	2.0	2.0	...	11.0	12.0	7.0	29.0	5.0	2.0	2.0	6.0	3.0	9.0
2015-01-22	7.0	7.0	6.0	9.0	7.0	14.0	10.0	21.0	NaN	6.0	...	19.0	13.0	11.0	22.0	1.0	5.0	1.0	6.0	4.0	6.0
2015-01-23	12.0	11.0	6.0	4.0	6.0	8.0	6.0	27.0	1.0	5.0	...	26.0	18.0	6.0	20.0	1.0	7.0	3.0	4.0	6.0	8.0
2015-01-24	14.0	9.0	7.0	8.0	4.0	11.0	15.0	23.0	NaN	4.0	...	10.0	13.0	5.0	17.0	1.0	8.0	NaN	3.0	5.0	10.
2015-01-25	5.0	9.0	3.0	5.0	2.0	20.0	6.0	29.0	NaN	2.0	...	15.0	13.0	7.0	15.0	3.0	4.0	1.0	6.0	3.0	5.0
2015-01-26	10.0	8.0	5.0	4.0	3.0	13.0	5.0	13.0	1.0	NaN	...	18.0	16.0	10.0	29.0	1.0	8.0	1.0	9.0	2.0	8.0
2015-01-27	6.0	8.0	6.0	3.0	3.0	6.0	3.0	13.0	NaN	3.0	...	20.0	16.0	9.0	20.0	2.0	11.0	2.0	6.0	3.0	5.0
2015-01-28	15.0	9.0	10.0	1.0	1.0	9.0	11.0	26.0	NaN	1.0	...	13.0	16.0	3.0	18.0	2.0	7.0	1.0	6.0	5.0	6.0
2015-01-29	9.0	9.0	11.0	2.0	3.0	11.0	7.0	26.0	1.0	6.0	...	19.0	20.0	4.0	24.0	2.0	6.0	1.0	8.0	4.0	5.0
2015-01-30	8.0	11.0	6.0	5.0	3.0	12.0	10.0	21.0	NaN	6.0	...	20.0	22.0	6.0	20.0	5.0	7.0	NaN	6.0	2.0	4.0
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2015-12-02	12.0	7.0	11.0	4.0	7.0	12.0	11.0	23.0	1.0	1.0	...	23.0	13.0	6.0	23.0	1.0	8.0	4.0	6.0	6.0	8.0
2015-12-03	6.0	11.0	9.0	2.0	4.0	12.0	7.0	32.0	1.0	1.0	...	16.0	19.0	7.0	17.0	2.0	7.0	3.0	3.0	2.0	4.0
2015-12-04	8.0	9.0	8.0	4.0	5.0	10.0	4.0	26.0	NaN	3.0	...	18.0	15.0	3.0	21.0	1.0	7.0	NaN	6.0	2.0	3.0
2015-12-05	9.0	7.0	5.0	5.0	5.0	8.0	13.0	33.0	1.0	2.0	...	13.0	20.0	5.0	26.0	3.0	9.0	3.0	5.0	2.0	4.0
2015-12-06	9.0	11.0	11.0	2.0	NaN	20.0	8.0	24.0	NaN	2.0	...	19.0	20.0	6.0	22.0	5.0	10.0	1.0	1.0	4.0	9.0
2015-12-07	7.0	10.0	8.0	1.0	6.0	10.0	8.0	19.0	1.0	3.0	...	20.0	21.0	3.0	30.0	3.0	8.0	2.0	6.0	4.0	6.0
2015-12-08	5.0	9.0	4.0	3.0	6.0	17.0	12.0	33.0	3.0	7.0	...	9.0	16.0	9.0	29.0	1.0	6.0	2.0	1.0	1.0	9.0
2015-12-09	12.0	11.0	7.0	8.0	9.0	15.0	12.0	24.0	NaN	5.0	...	11.0	16.0	3.0	20.0	6.0	7.0	1.0	4.0	4.0	6.0
2015-12-10	3.0	6.0	9.0	8.0	6.0	25.0	13.0	29.0	1.0	3.0	...	19.0	16.0	8.0	20.0	2.0	8.0	4.0	5.0	3.0	2.0
2015-12-11	11.0	7.0	11.0	6.0	5.0	19.0	10.0	29.0	NaN	2.0	...	17.0	19.0	3.0	19.0	4.0	10.0	3.0	4.0	10.0	9.0
2015-12-12	10.0	5.0	7.0	8.0	4.0	25.0	15.0	38.0	1.0	2.0	...	17.0	16.0	9.0	19.0	1.0	7.0	2.0	NaN	5.0	3.0
2015-12-13	7.0	12.0	10.0	3.0	4.0	21.0	9.0	38.0	NaN	6.0	...	17.0	17.0	7.0	14.0	NaN	2.0	3.0	3.0	5.0	5.0
2015-12-14	15.0	12.0	11.0	9.0	6.0	9.0	10.0	27.0	1.0	4.0	...	18.0	29.0	11.0	12.0	4.0	4.0	2.0	6.0	3.0	12.
2015-12-15	10.0	6.0	11.0	5.0	3.0	10.0	21.0	24.0	NaN	9.0	...	19.0	19.0	11.0	14.0	NaN	8.0	1.0	7.0	3.0	7.0
2015-12-16	6.0	7.0	12.0	5.0	4.0	19.0	9.0	20.0	1.0	3.0	...	18.0	15.0	10.0	23.0	1.0	9.0	2.0	4.0	4.0	5.0
2015-12-17	8.0	8.0	8.0	7.0	5.0	18.0	19.0	28.0	NaN	3.0	...	15.0	19.0	4.0	15.0	NaN	10.0	NaN	6.0	7.0	7.0
2015-12-18	13.0	7.0	6.0	6.0	2.0	17.0	19.0	27.0	NaN	3.0	...	15.0	16.0	7.0	19.0	3.0	9.0	NaN	4.0	5.0	4.0
2015-12-19	7.0	11.0	6.0	3.0	1.0	10.0	12.0	41.0	2.0	3.0	...	10.0	12.0	5.0	21.0	1.0	7.0	NaN	2.0	3.0	4.0

Community Area	12.9	8.0	13.9	7.0	3.0	18.8	10.9	21.8	1.0	2.0	...	15.8	23.8	5.9	15.9	3.9	7.9	2.9	2.9	5.9	1.9
Day	6.0	2.0	11.0	4.0	NaN	6.0	11.0	32.0	NaN	3.0	...	12.0	15.0	3.0	18.0	2.0	9.0	1.0	1.0	2.0	5.0
2015-12-21	13.0	11.0	15.0	5.0	4.0	13.0	9.0	26.0	NaN	NaN	...	26.0	16.0	3.0	16.0	2.0	6.0	NaN	5.0	2.0	8.0
2015-12-22	12.0	11.0	14.0	6.0	5.0	18.0	12.0	28.0	NaN	3.0	...	18.0	23.0	8.0	19.0	1.0	9.0	4.0	8.0	2.0	7.0
2015-12-23	8.0	11.0	2.0	6.0	3.0	19.0	11.0	26.0	NaN	7.0	...	16.0	22.0	4.0	19.0	3.0	3.0	2.0	5.0	3.0	5.0
2015-12-24	2.0	6.0	3.0	3.0	NaN	5.0	5.0	10.0	1.0	5.0	...	13.0	15.0	3.0	18.0	1.0	5.0	NaN	6.0	3.0	4.0
2015-12-25	6.0	11.0	12.0	1.0	1.0	17.0	5.0	26.0	NaN	9.0	...	15.0	18.0	6.0	17.0	1.0	10.0	NaN	3.0	7.0	8.0
2015-12-26	14.0	8.0	6.0	3.0	1.0	16.0	11.0	32.0	NaN	1.0	...	11.0	19.0	3.0	26.0	2.0	8.0	2.0	1.0	4.0	2.0
2015-12-27	7.0	8.0	5.0	2.0	2.0	10.0	8.0	19.0	NaN	3.0	...	12.0	22.0	9.0	14.0	2.0	6.0	2.0	2.0	3.0	9.0
2015-12-28	6.0	7.0	12.0	8.0	3.0	8.0	5.0	25.0	NaN	1.0	...	18.0	16.0	7.0	18.0	NaN	8.0	3.0	2.0	2.0	4.0
2015-12-29	5.0	8.0	7.0	4.0	1.0	11.0	15.0	27.0	1.0	6.0	...	11.0	23.0	6.0	14.0	2.0	8.0	1.0	7.0	5.0	5.0
2015-12-30	NaN	NaN	NaN	NaN	NaN	1.0	NaN	NaN	NaN	NaN	...	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2015-12-31																					

365 rows × 77 columns

In [26]:

```
community_timeseries[[15,20,77]].plot();
```



## Parte voluntaria

Descargue la base de datos de información socioeconómica (<https://data.cityofchicago.org/Health-Human-Services/Census-Data-Selected-socioeconomic-indicators-in-C/kn9c-c2s2>).

## 4.

Cree una tabla que agregue el número de crímenes por Community Area. Una esa tabla con la de datos socioeconómicos y cree un "scatter plot" de número de crímenes vs ingreso per cápita. Explique la relación en palabras.