

Progresión geométrica del Covid 19 - Programación en Python

Aruani, Juan* De Mezzo, Facundo† López, Emilia‡ López, Bernardo§

2022-06-14

Introducción

A lo largo de este documento se procede a realizar un análisis de el comportamiento del Covid 19 mediante el uso del lenguaje Python

1. Lectura de datos desde un CSV

Para empezar, se importa la librería “csv” para poder trabajar con los datos correspondientes, y se los lee¹.

Se procede a importar la información y a mostrar los encabezados y las primeras filas para corroborar. Notese que se debe especificar el delimitador específico “;” en caso de que no sea una coma “,”.

```
import csv

with open('casos.csv') as info:
    reader = csv.reader(info,delimiter=";")

    contador = 0

    for fila in reader:
        print(fila)

        if contador > 5:
            break

    contador +=1
```

```
## ['Covid Argentina', '', '']
## ['Fecha', 'Casos', 'E_P+1']
## ['05/03/2020', '1', '']
## ['06/03/2020', '2', '']
## ['07/03/2020', '2', '']
## ['08/03/2020', '12', '']
## ['09/03/2020', '17', '']
```

*juan.aruani.99@gmail.com

†em.cn.demezzo.facundo@gmail.com

‡emilia.lop49@gmail.com

§bernilopezmorel@gmail.com

¹El archivo del que se extrae la información debe estar en la misma carpeta que el programa para poder obtener la información

2. Gráfico de la cantidad de casos

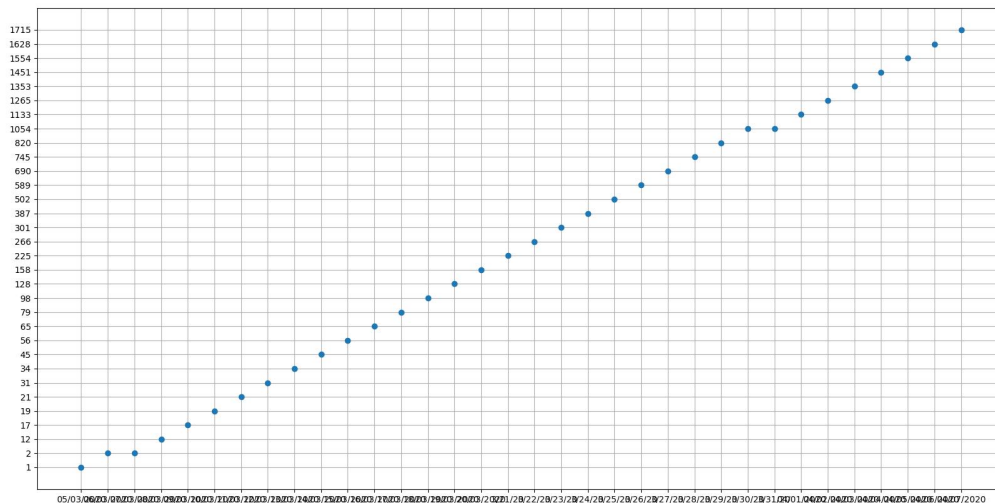
Se presenta un gráfico con la cantidad de contagios en las fechas correspondientes

```
import csv
import pandas as pd
from matplotlib import pyplot as plt

with open('casos.csv') as info:
    reader = csv.reader(info, delimiter=",")
    next(reader)
    next(reader)
    i=0
    fechas=[]
    casos=[]
    for fila in reader:
        fechas.append(fila[0])
        casos.append(fila[1])
        i += 1

## ['Covid Argentina', '', '']
## ['Fecha', 'Casos', 'E_P+1']

plt.figure(figsize=(20, 10))
plt.plot_date(fechas, casos)
plt.grid(visible=True)
#plt.show()
plt.savefig("Gráfica de casos.jpg")
```



3. Histograma de contagios

```
import csv
import pandas as pd
from matplotlib import pyplot as pyplot
```

```
with open('casos.csv') as info:
    reader = csv.reader(info, delimiter=";")
    next(reader)
    next(reader)
    i=0
    fechas=[]
    casos=[]
    for fila in reader:
        fechas.append(fila[0])
        casos.append(fila[1])
        i += 1
```

```
## ['Covid Argentina', '', '']
## ['Fecha', 'Casos', 'E_P+1']
```

```
pyplot.figure(figsize=(20, 10))
pyplot.grid(visible=True)
pyplot.hist(casos,rwidth=0.5, label="Histograma de casos Covid 19")
#pyplot.show()
```

```
## (array([5., 3., 3., 3., 3., 3., 3., 4., 3., 4.]), array([ 0. ,  3.1,  6.2,  9.3, 12.4, 15.5, 18.6, 21.7, 24.8, 27.9, 31., 34.1, 37.2, 40.3, 43.4, 46.5, 49.6, 52.7, 55.8, 58.9, 62., 65.1, 68.2, 71.3, 74.4, 77.5, 80.6, 83.7, 86.8, 89.9, 93., 96.1, 99.2, 102.3, 105.4, 108.5, 111.6, 114.7, 117.8, 120.9, 124., 127.1, 130.2, 133.3, 136.4, 139.5, 142.6, 145.7, 148.8, 151.9, 155., 158.1, 161.2, 164.3, 167.4, 170.5, 173.6, 176.7, 179.8, 182.9, 186., 189.1, 192.2, 195.3, 198.4, 201.5, 204.6, 207.7, 210.8, 213.9, 217., 220.1, 223.2, 226.3, 229.4, 232.5, 235.6, 238.7, 241.8, 244.9, 248., 251.1, 254.2, 257.3, 260.4, 263.5, 266.6, 269.7, 272.8, 275.9, 279., 282.1, 285.2, 288.3, 291.4, 294.5, 297.6, 300.7, 303.8, 306.9, 310., 313.1, 316.2, 319.3, 322.4, 325.5, 328.6, 331.7, 334.8, 337.9, 341., 344.1, 347.2, 350.3, 353.4, 356.5, 359.6, 362.7, 365.8, 368.9, 372., 375.1, 378.2, 381.3, 384.4, 387.5, 390.6, 393.7, 396.8, 399.9, 403., 406.1, 409.2, 412.3, 415.4, 418.5, 421.6, 424.7, 427.8, 430.9, 434., 437.1, 440.2, 443.3, 446.4, 449.5, 452.6, 455.7, 458.8, 461.9, 465., 468.1, 471.2, 474.3, 477.4, 480.5, 483.6, 486.7, 489.8, 492.9, 496., 499.1, 502.2, 505.3, 508.4, 511.5, 514.6, 517.7, 520.8, 523.9, 527., 530.1, 533.2, 536.3, 539.4, 542.5, 545.6, 548.7, 551.8, 554.9, 558., 561.1, 564.2, 567.3, 570.4, 573.5, 576.6, 579.7, 582.8, 585.9, 589., 592.1, 595.2, 598.3, 601.4, 604.5, 607.6, 610.7, 613.8, 616.9, 620., 623.1, 626.2, 629.3, 632.4, 635.5, 638.6, 641.7, 644.8, 647.9, 651., 654.1, 657.2, 660.3, 663.4, 666.5, 669.6, 672.7, 675.8, 678.9, 682., 685.1, 688.2, 691.3, 694.4, 697.5, 700.6, 703.7, 706.8, 709.9, 713., 716.1, 719.2, 722.3, 725.4, 728.5, 731.6, 734.7, 737.8, 740.9, 744., 747.1, 750.2, 753.3, 756.4, 759.5, 762.6, 765.7, 768.8, 771.9, 775., 778.1, 781.2, 784.3, 787.4, 790.5, 793.6, 796.7, 799.8, 802.9, 806., 809.1, 812.2, 815.3, 818.4, 821.5, 824.6, 827.7, 830.8, 833.9, 837., 840.1, 843.2, 846.3, 849.4, 852.5, 855.6, 858.7, 861.8, 864.9, 868., 871.1, 874.2, 877.3, 880.4, 883.5, 886.6, 889.7, 892.8, 895.9, 899., 902.1, 905.2, 908.3, 911.4, 914.5, 917.6, 920.7, 923.8, 926.9, 930., 933.1, 936.2, 939.3, 942.4, 945.5, 948.6, 951.7, 954.8, 957.9, 961., 964.1, 967.2, 970.3, 973.4, 976.5, 979.6, 982.7, 985.8, 988.9, 992., 995.1, 998.2, 1001.3, 1004.4, 1007.5, 1010.6, 1013.7, 1016.8, 1019.9, 1023., 1026.1, 1029.2, 1032.3, 1035.4, 1038.5, 1041.6, 1044.7, 1047.8, 1050.9, 1054., 1057.1, 1060.2, 1063.3, 1066.4, 1069.5, 1072.6, 1075.7, 1078.8, 1081.9, 1085., 1088.1, 1091.2, 1094.3, 1097.4, 1100.5, 1103.6, 1106.7, 1109.8, 1112.9, 1116., 1119.1, 1122.2, 1125.3, 1128.4, 1131.5, 1134.6, 1137.7, 1140.8, 1143.9, 1147., 1150.1, 1153.2, 1156.3, 1159.4, 1162.5, 1165.6, 1168.7, 1171.8, 1175., 1178.1, 1181.2, 1184.3, 1187.4, 1190.5, 1193.6, 1196.7, 1199.8, 1202.9, 1206., 1209.1, 1212.2, 1215.3, 1218.4, 1221.5, 1224.6, 1227.7, 1230.8, 1233.9, 1237., 1240.1, 1243.2, 1246.3, 1249.4, 1252.5, 1255.6, 1258.7, 1261.8, 1264.9, 1268., 1271.1, 1274.2, 1277.3, 1280.4, 1283.5, 1286.6, 1289.7, 1292.8, 1295.9, 1299., 1302.1, 1305.2, 1308.3, 1311.4, 1314.5, 1317.6, 1320.7, 1323.8, 1326.9, 1330., 1333.1, 1336.2, 1339.3, 1342.4, 1345.5, 1348.6, 1351.7, 1354.8, 1357.9, 1361., 1364.1, 1367.2, 1370.3, 1373.4, 1376.5, 1379.6, 1382.7, 1385.8, 1388.9, 1392., 1395.1, 1398.2, 1401.3, 1404.4, 1407.5, 1410.6, 1413.7, 1416.8, 1419.9, 1423., 1426.1, 1429.2, 1432.3, 1435.4, 1438.5, 1441.6, 1444.7, 1447.8, 1450.9, 1454., 1457.1, 1460.2, 1463.3, 1466.4, 1469.5, 1472.6, 1475.7, 1478.8, 1481.9, 1485., 1488.1, 1491.2, 1494.3, 1497.4, 1500.5, 1503.6, 1506.7, 1509.8, 1512.9, 1516., 1519.1, 1522.2, 1525.3, 1528.4, 1531.5, 1534.6, 1537.7, 1540.8, 1543.9, 1547., 1550.1, 1553.2, 1556.3, 1559.4, 1562.5, 1565.6, 1568.7, 1571.8, 1574.9, 1578., 1581.1, 1584.2, 1587.3, 1590.4, 1593.5, 1596.6, 1599.7, 1602.8, 1605.9, 1609., 1612.1, 1615.2, 1618.3, 1621.4, 1624.5, 1627.6, 1630.7, 1633.8, 1636.9, 1640., 1643.1, 1646.2, 1649.3, 1652.4, 1655.5, 1658.6, 1661.7, 1664.8, 1667.9, 1671., 1674.1, 1677.2, 1680.3, 1683.4, 1686.5, 1689.6, 1692.7, 1695.8, 1698.9, 1702., 1705.1, 1708.2, 1711.3, 1714.4, 1717.5, 1720.6, 1723.7, 1726.8, 1729.9, 1733., 1736.1, 1739.2, 1742.3, 1745.4, 1748.5, 1751.6, 1754.7, 1757.8, 1760.9, 1764., 1767.1, 1770.2, 1773.3, 1776.4, 1779.5, 1782.6, 1785.7, 1788.8, 1791.9, 1795., 1798.1, 1801.2, 1804.3, 1807.4, 1810.5, 1813.6, 1816.7, 1819.8, 1822.9, 1826., 1829.1, 1832.2, 1835.3, 1838.4, 1841.5, 1844.6, 1847.7, 1850.8, 1853.9, 1857., 1860.1, 1863.2, 1866.3, 1869.4, 1872.5, 1875.6, 1878.7, 1881.8, 1884.9, 1888., 1891.1, 1894.2, 1897.3, 1900.4, 1903.5, 1906.6, 1909.7, 1912.8, 1915.9, 1919., 1922.1, 1925.2, 1928.3, 1931.4, 1934.5, 1937.6, 1940.7, 1943.8, 1946.9, 1950., 1953.1, 1956.2, 1959.3, 1962.4, 1965.5, 1968.6, 1971.7, 1974.8, 1977.9, 1981., 1984.1, 1987.2, 1990.3, 1993.4, 1996.5, 1999.6, 2002.7, 2005.8, 2008.9, 2012., 2015.1, 2018.2, 2021.3, 2024.4, 2027.5, 2030.6, 2033.7, 2036.8, 2039.9, 2043., 2046.1, 2049.2, 2052.3, 2055.4, 2058.5, 2061.6, 2064.7, 2067.8, 2070.9, 2074., 2077.1, 2080.2, 2083.3, 2086.4, 2089.5, 2092.6, 2095.7, 2098.8, 2101.9, 2105., 2108.1, 2111.2, 2114.3, 2117.4, 2120.5, 2123.6, 2126.7, 2129.8, 2132.9, 2136., 2139.1, 2142.2, 2145.3, 2148.4, 2151.5, 2154.6, 2157.7, 2160.8, 2163.9, 2167., 2170.1, 2173.2, 2176.3, 2179.4, 2182.5, 2185.6, 2188.7, 2191.8, 2194.9, 2198., 2201.1, 2204.2, 2207.3, 2210.4, 2213.5, 2216.6, 2219.7, 2222.8, 2225.9, 2229., 2232.1, 2235.2, 2238.3, 2241.4, 2244.5, 2247.6, 2250.7, 2253.8, 2256.9, 2260., 2263.1, 2266.2, 2269.3, 2272.4, 2275.5, 2278.6, 2281.7, 2284.8, 2287.9, 2291., 2294.1, 2297.2, 2300.3, 2303.4, 2306.5, 2309.6, 2312.7, 2315.8, 2318.9, 2322., 2325.1, 2328.2, 2331.3, 2334.4, 2337.5, 2340.6, 2343.7, 2346.8, 2349.9, 2353., 2356.1, 2359.2, 2362.3, 2365.4, 2368.5, 2371.6, 2374.7, 2377.8, 2380.9, 2384., 2387.1, 2390.2, 2393.3, 2396.4, 2399.5, 2402.6, 2405.7, 2408.8, 2411.9, 2415., 2418.1, 2421.2, 2424.3, 2427.4, 2430.5, 2433.6, 2436.7, 2439.8, 2442.9, 2446., 2449.1, 2452.2, 2455.3, 2458.4, 2461.5, 2464.6, 2467.7, 2470.8, 2473.9, 2477., 2480.1, 2483.2, 2486.3, 2489.4, 2492.5, 2495.6, 2498.7, 2501.8, 2504.9, 2508., 2511.1, 2514.2, 2517.3, 2520.4, 2523.5, 2526.6, 2529.7, 2532.8, 2535.9, 2539., 2542.1, 2545.2, 2548.3, 2551.4, 2554.5, 2557.6, 2560.7, 2563.8, 2566.9, 2570., 2573.1, 2576.2, 2579.3, 2582.4, 2585.5, 2588.6, 2591.7, 2594.8, 2597.9, 2601., 2604.1, 2607.2, 2610.3, 2613.4, 2616.5, 2619.6, 2622.7, 2625.8, 2628.9, 2632., 2635.1, 2638.2, 2641.3, 2644.4, 2647.5, 2650.6, 2653.7, 2656.8, 2659.9, 2663., 2666.1, 2669.2, 2672.3, 2675.4, 2678.5, 2681.6, 2684.7, 2687.8, 2690.9, 2694., 2697.1, 2700.2, 2703.3, 2706.4, 2709.5, 2712.6, 2715.7, 2718.8, 2721.9, 2725., 2728.1, 2731.2, 2734.3, 2737.4, 2740.5, 2743.6, 2746.7, 2749.8, 2752.9, 2756., 2759.1, 2762.2, 2765.3, 2768.4, 2771.5, 2774.6, 2777.7, 2780.8, 2783.9, 2787., 2790.1, 2793.2, 2796.3, 2799.4, 2802.5, 2805.6, 2808.7, 2811.8, 2814.9, 2818., 2821.1, 2824.2, 2827.3, 2830.4, 2833.5, 2836.6, 2839.7, 2842.8, 2845.9, 2849., 2852.1, 2855.2, 2858.3, 2861.4, 2864.5, 2867.6, 2870.7, 2873.8, 2876.9, 2880., 2883.1, 2886.2, 2889.3, 2892.4, 2895.5, 2898.6, 2901.7, 2904.8, 2907.9, 2911., 2914.1, 2917.2, 2920.3, 2923.4, 2926.5, 2929.6, 2932.7, 2935.8, 2938.9, 2942., 2945.1, 2948.2, 2951.3, 2954.4, 2957.5, 2960.6, 2963.7, 2966.8, 2969.9, 2973., 2976.1, 2979.2, 2982.3, 2985.4, 2988.5, 2991.6, 2994.7, 2997.8, 3000.9, 3004., 3007.1, 3010.2, 3013.3, 3016.4, 3019.5, 3022.6, 3025.7, 3028.8, 3031.9, 3035., 3038.1, 3041.2, 3044.3, 3047.4, 3050.5, 3053.6, 3056.7, 3059.8, 3062.9, 3066., 3069.1, 3072.2, 3075.3, 3078.4, 3081.5, 3084.6, 3087.7, 3090.8, 3093.9, 3097., 3100.1, 3103.2, 3106.3, 3109.4, 3112.5, 3115.6, 3118.7, 3121.8, 3124.9, 3128., 3131.1, 3134.2, 3137.3, 3140.4, 3143.5, 3146.6, 3149.7, 3152.8, 3155.9, 3159., 3162.1, 3165.2, 3168.3, 3171.4, 3174.5, 3177.6, 3180.7, 3183.8, 3186.9, 3190., 3193.1, 3196.2, 3199.3, 3202.4, 3205.5, 3208.6, 3211.7, 3214.8, 3217.9, 3221., 3224.1, 3227.2, 3230.3, 3233.4, 3236.5, 3239.6, 3242.7, 3245.8, 3248.9, 3252., 3255.1, 3258.2, 3261.3, 3264.4, 3267.5, 3270.6, 3273.7, 3276.8, 3279.9, 3283., 3286.1, 3289.2, 3292.3, 3295.4, 3298.5, 3301.6, 3304.7, 3307.8, 3310.9, 3314., 3317.1, 3320.2, 3323.3, 3326.4, 3329.5, 3332.6, 3335.7, 3338.8, 3341.9, 3345., 3348.1, 3351.2, 3354.3, 3357.4, 3360.5, 3363.6, 3366.7, 3369.8, 3372.9, 3376., 3379.1, 3382.2, 3385.3, 3388.4, 3391.5, 3394.6, 3397.7, 3400.8, 3403.9, 3407., 3410.1, 3413.2, 3416.3, 3419.4, 3422.5, 3425.6, 3428.7, 3431.8, 3434.9, 3438., 3441.1, 3444.2, 3447.3, 3450.4, 3453.5, 3456.6, 3459.7, 3462.8, 3465.9, 3469., 3472.1, 3475.2, 3478.3, 3481.4, 3484.5, 3487.6, 3490.7, 3493.8, 3496.9, 3500., 3503.1, 3506.2, 3509.3, 3512.4, 3515.5, 3518.6, 3521.7, 3524.8, 3527.9, 3531., 3534.1, 3537.2, 3540.3, 3543.4, 3546.5, 3549.6, 3552.7, 3555.8, 3558.9, 3562., 3565.1, 3568.2, 3571.3, 3574.4, 3577.5, 3580.6, 3583.7, 3586.8, 3589.9, 3593., 3596.1, 3599.2, 3602.3, 3605.4, 3608.5, 3611.6, 3614.7, 3617.8, 3620.9, 3624., 3627.1, 3630.2, 3633.3, 3636.4, 3639.5, 3642.6, 3645.7, 3648.8, 3651.9, 3655., 3658.1, 3661.2, 3664.3, 3667.4, 3670.5, 3673.6, 3676.7, 3679.8, 3682.9, 3686., 3689.1, 3692.2, 3695.3, 3698.4, 3701.5, 3704.6, 3707.7, 3710.8, 3713.9, 3717., 3720.1, 3723.2, 3726.3, 3729.4, 3732.5, 3735.6, 3738.7, 3741.8, 3744.9, 3748., 3751.1, 3754.2, 3757.3, 3760.4, 3763.5, 3766.6, 3769.7, 3772.8, 3775.9, 3779., 3782.1, 3785.2, 3788.3, 3791.4, 3794.5, 3797.6, 3800.7, 3803.8, 3806.9, 3810., 3813.1, 3816.2, 3819.3, 3822.4, 3825.5, 3828.6, 3831.7, 3834.8, 3837.9, 3841., 3844.1, 3847.2, 3850.3, 3853.4, 3856.5, 3859.6, 3862.7, 3865.8, 3868.9, 3872., 3875.1, 3878.2, 3881.3, 3884.4, 3887.5, 3890.6, 3893.7, 3896.8, 3899.9, 3903., 3906.1, 3909.2, 3912.3, 3915.4, 3918.5, 3921.6, 3924.7, 3927.8, 3930.9, 3934., 3937.1, 3940.2, 3943.3, 3946.4, 3949.5, 3952.6, 3955.7, 3958.8, 3961.9, 3965., 3968.1, 3971.2, 3974.3, 3977.4, 3980.5, 3983.6, 3986.7, 3989.8, 3992.9, 3996., 3999.1, 4002.2, 4005.3, 4008.4, 4011.5, 4014.6, 4017.7, 4020.8, 4023.9, 4027., 4030.1, 4033.2, 4036.3, 4039.4, 4042.5, 4045.6, 4048.7, 4051.8, 4054.9, 4058., 4061.1, 4064.2, 4067.3, 4070.4, 4073.5, 4076.6, 4079.7, 4082.8, 4085.9, 4089., 4092.1, 4095.2, 4098.3, 4101.4, 4104.5, 4107.6, 4110.7, 4113.8, 4116.9, 4120., 4123.1, 4126.2, 4129.3, 4132.4, 4135.5, 4138.6, 4141.7, 4144.8, 4147.9, 4151., 4154.1, 4157.2, 4160.3, 4163.4, 4166.5, 4169.6, 4172.7, 4175.8, 4178.9, 4182., 4185.1, 4188.2, 4191.3, 4194.4, 4197.5, 4200.6, 4203.7, 4206.8, 4209.9, 4213., 4216.1, 4219.2, 4222.3, 4225.4, 4228.5, 4231.6, 4234.7, 4237.8, 4240.9, 4244., 4247.1, 4250.2, 4253.3, 4256.4, 4259.5, 4262.6, 4265.7, 4268.8, 4271.9, 4275., 4278.1, 4281.2, 4284.3, 4287.4, 4290.5, 4293.6, 4296.7, 4299.8, 4302.9, 4306., 4309.1, 4312.2, 4315.3, 4318.4, 4321.5, 4324.6, 4327.7, 4330.8, 4333.9, 4337., 4340.1, 4343.2, 4346.3, 4349.4, 4352.5, 4355.6, 4358.7, 4361.8, 4364.9, 4368., 4371.1, 4374.2, 4377.3, 4380.4, 4383.5, 4386.6, 4389.7, 4392.8, 4395.9, 4399., 4402.1, 4405.2, 4408.3, 4411.4, 4414.5, 4417.6, 4420.7, 4423.8, 4426.9, 4430., 4433.1, 4436.2, 4439.3, 4442.4, 4445.5, 4448.6, 4451.7, 4454.8, 4457.9, 4461., 4464.1, 4467.2, 4470.3, 4473.4, 4476.5, 4479.6, 4482.7, 4485.8, 4488.9, 4492., 4495.1, 4498.2, 4501.3, 4504.4, 4507.5, 4510.6, 4513.7, 4516.8, 4519.9, 4523., 4526.1, 4529.2, 4532.3, 4535.4, 4538.5, 4541.6, 4544.7, 4547.8, 4550.9, 4554., 4557.1, 4560.2, 4563.3, 4566.4, 4569.5, 4572.6, 4575.7, 4578.8, 4581.9, 4585., 4588.1, 4591.2, 4594.3, 4597.4, 4600.5, 4603.6, 4606.7, 4609.8, 4612.9, 4616., 4619.1, 4622.2, 4625.3, 4628.4, 4631.5, 4634.6, 4637.7, 4640.8, 4643.9, 4647., 4650.1, 4653.2, 4656.3, 4659.4, 4662.5, 4665.6, 4668.7, 4671.8, 4674.9, 4678., 4681.1, 4684.2, 4687.3, 4690.4, 4693.5, 4696.6, 4699.7, 4702.8, 4705.9, 4709., 4712.1, 4715.2, 4718.3, 4721.4, 4724.5, 4727.6, 4730.7, 4733.8, 4736.9, 4740., 4743.1, 4746.2, 4749.3, 4752.4, 4755.5, 4758.6, 4761.7, 4764.8, 4767.9, 4771., 4774.1, 4777.2, 4780.3, 4783.4, 4786.5, 4789.6, 4792.7, 4795.8, 4798.9, 4802., 4805.1, 4808.2, 4811.3, 4814.4, 4817.5, 4820.6, 4823.7, 4826.8, 4829.9, 4833., 4836.1, 4839.2, 4842.3, 4845.4, 4848.5, 4851.6, 4854.7, 4857.8, 4860.9, 4864., 4867.1, 4870.2, 4873.3, 4876.4, 4879.5, 4882.6, 4885.7, 4888.8, 4891.9, 4895., 4898.1, 4901.2,
```

4. Densidad de casos

```
import csv
import pandas as pd
from matplotlib import pyplot as plt

with open('casos.csv') as info:
    reader = csv.reader(info, delimiter=";")
    next(reader)
    next(reader)
    i=0
    fechas=[]
    casos=[]
    for fila in reader:
        fechas.append(fila[0])
        casos.append(fila[1])
        i += 1

#Cambiamos el tipo de variable

## ['Covid Argentina', '', '']
## ['Fecha', 'Casos', 'E_P+1']

casosnum=[]
for caso in casos:
    casosnum.append(float(caso))

fig = pd.DataFrame(casosnum).plot(kind='density',title="Densidad de casos").get_figure()
fig.savefig('Densidad de casos.png')
```

5. Estadística de casos

```
import csv
import pandas as pd
from matplotlib import pyplot as plt

with open('casos.csv') as info:
    reader = csv.reader(info, delimiter=";")
    next(reader)
    next(reader)
    i=0
    fechas=[]
    casos=[]
    for fila in reader:
        fechas.append(fila[0])
        casos.append(fila[1])
        i += 1
```

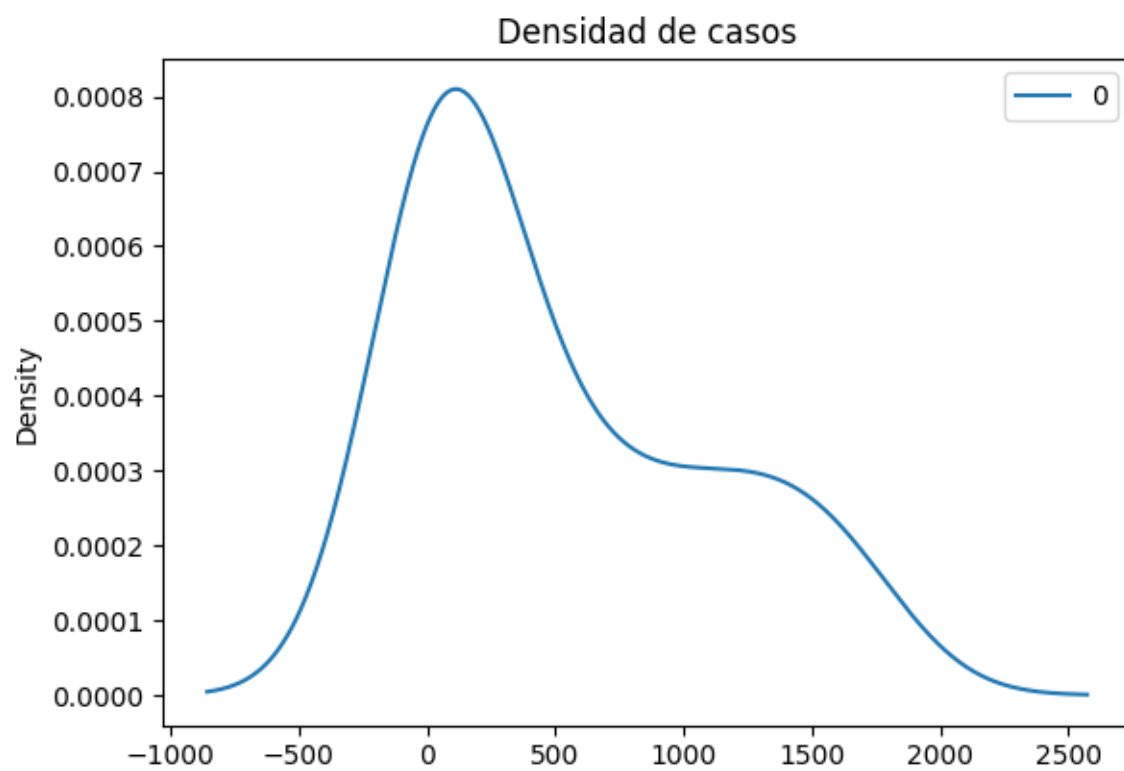


Figure 3: output

```
#Cambiamos el tipo de variable
```

```
## ['Covid Argentina', '', '']  
## ['Fecha', 'Casos', 'E_P+1']  
  
casosnum=[]  
for caso in casos:  
    casosnum.append(float(caso))  
  
df = pd.DataFrame(casosnum)  
print(df.describe())
```

```
##          0  
## count    34.000000  
## mean     514.705882  
## std      571.416874  
## min       1.000000  
## 25%      36.750000  
## 50%     245.500000  
## 75%     995.500000  
## max     1715.000000
```

6. Cálculo del factor de contagios

Se puede calcular el factor de contagios F mediante el cociente entre los infectados de hoy y los de ayer

$$F = I_{n+1}/I_n$$

```
import csv  
import pandas as pd  
from matplotlib import pyplot as plt  
  
with open('casos.csv') as info:  
    reader = csv.reader(info, delimiter=";")  
    next(reader)  
    next(reader)  
    i=0  
    fechas=[]  
    casos=[]  
    for fila in reader:  
        fechas.append(fila[0])  
        casos.append(fila[1])  
        i += 1
```

```
#Cambiamos el tipo de variable
```

```
## ['Covid Argentina', '', '']  
## ['Fecha', 'Casos', 'E_P+1']  
  
casosnum=[]  
for caso in casos:
```

```

    casosnum.append(float(caso))

m = len(casosnum)
F=[]
for i in range(0,m):
    F.append((casosnum[i])/(casosnum[i-1]))

n=len(F)-1
print("El Factor de contagios el último día registrado es:")

## El Factor de contagios el último día registrado es:
print(F[n])

## 1.0534398034398034

```

7. Estadísticos de F

```

import csv
import pandas as pd
from matplotlib import pyplot as plt

with open('casos.csv') as info:
    reader = csv.reader(info, delimiter=";")
    next(reader)
    next(reader)
    i=0
    fechas=[]
    casos=[]
    for fila in reader:
        fechas.append(fila[0])
        casos.append(fila[1])
        i += 1

#Cambiamos el tipo de variable

## ['Covid Argentina', '', '']
## ['Fecha', 'Casos', 'E_P+1']

casosnum=[]
for caso in casos:
    casosnum.append(float(caso))

m = len(casosnum)
F=[]
for i in range(0,m):
    F.append((casosnum[i])/(casosnum[i-1]))

```

```
dfactor = pd.DataFrame(casosnum)
print(dfactor.describe())
```

```
##              0
## count    34.000000
## mean     514.705882
## std      571.416874
## min       1.000000
## 25%      36.750000
## 50%     245.500000
## 75%     995.500000
## max     1715.000000
```