

Untitled4

May 3, 2021

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[52]: import pandas as pd
df = pd.read_csv("~/Desktop/2020 Spring Q/STA141A/AB_NYC_2019.csv")
```

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[3]: df
```

```
[3]:      id      name  host_id \
0    2539  Clean & quiet apt home by the park    2787
1    2595      Skylit Midtown Castle    2845
2    3647  THE VILLAGE OF HARLEM...NEW YORK !    4632
3    3831    Cozy Entire Floor of Brownstone    4869
4    5022  Entire Apt: Spacious Studio/Loft by central park    7192
5    5099    Large Cozy 1 BR Apartment In Midtown East    7322
6    5121      BlissArtsSpace!    7356
7    5178    Large Furnished Room Near B'way    8967
8    5203    Cozy Clean Guest Room - Family Apt    7490
9    5238    Cute & Cozy Lower East Side 1 bdrm    7549
10   5295    Beautiful 1br on Upper West Side    7702
11   5441    Central Manhattan/near Broadway    7989
12   5803    Lovely Room 1, Garden, Best Area, Legal rental    9744
13   6021    Wonderful Guest Bedroom in Manhattan for SINGLES    11528
14   6090    West Village Nest - Superhost    11975
15   6848    Only 2 stops to Manhattan studio    15991
16   7097    Perfect for Your Parents + Garden    17571
17   7322    Chelsea Perfect    18946
18   7726    Hip Historic Brownstone Apartment with Backyard    20950
19   7750    Huge 2 BR Upper East Cental Park    17985
20   7801    Sweet and Spacious Brooklyn Loft    21207
21   8024    CBG CtyBGd HelpsHaiti rm#1:1-4    22486
22   8025    CBG Helps Haiti Room#2.5    22486
23   8110    CBG Helps Haiti Rm #2    22486
24   8490    MAISON DES SIRENES1,bohemian apartment    25183
25   8505    Sunny Bedroom Across Prospect Park    25326
26   8700    Magnifique Suite au N de Manhattan - vue Cloitres    26394
27   9357    Midtown Pied-a-terre    30193
28   9518    SPACIOUS, LOVELY FURNISHED MANHATTAN BEDROOM    31374
29   9657    Modern 1 BR / NYC / EAST VILLAGE    21904
...     ...     ...     ...
48865  36472171    1 bedroom in sunlit apartment    99144947
```

48866	36472710	CozyHideAway Suite	274225617
48867	36473044	The place you were dreaming for.(only for guys)	261338177
48868	36473253	Heaven for you(only for guy)	261338177
48869	36474023	Cozy, Sunny Brooklyn Escape	1550580
48870	36474911	Cozy, clean Williamsburg 1- bedroom apartment	1273444
48871	36475746	A LARGE ROOM - 1 MONTH MINIMUM - WASHER&DRYER	144008701
48872	36476675	Nycity-MyHome	8636072
48873	36477307	Brooklyn paradise	241945355
48874	36477588	Short Term Rental in East Harlem	214535893
48875	36478343	Welcome all as family	274273284
48876	36478357	Cozy, Air-Conditioned Private Bedroom in Harlem	177932088
48877	36479230	Studio sized room with beautiful light	65767720
48878	36479723	Room for rest	41326856
48879	36480292	Gorgeous 1.5 Bdr with a private yard- Williams...	540335
48880	36481315	The Raccoon Artist Studio in Williamsburg New ...	208514239
48881	36481615	Peaceful space in Greenpoint, BK	274298453
48882	36482231	Bushwick _ Myrtle-Wyckoff	66058896
48883	36482416	Sunny Bedroom NYC! Walking to Central Park!!	131529729
48884	36482783	Brooklyn Oasis in the heart of Williamsburg	274307600
48885	36482809	Stunning Bedroom NYC! Walking to Central Park!!	131529729
48886	36483010	Comfy 1 Bedroom in Midtown East	274311461
48887	36483152	Garden Jewel Apartment in Williamsburg New York	208514239
48888	36484087	Spacious Room w/ Private Rooftop, Central loca...	274321313
48889	36484363	QUIT PRIVATE HOUSE	107716952
48890	36484665	Charming one bedroom - newly renovated rowhouse	8232441
48891	36485057	Affordable room in Bushwick/East Williamsburg	6570630
48892	36485431	Sunny Studio at Historical Neighborhood	23492952
48893	36485609	43rd St. Time Square-cozy single bed	30985759
48894	36487245	Trendy duplex in the very heart of Hell's Kitchen	68119814

	host_name	neighbourhood_group	neighbourhood	latitude \
0	John	Brooklyn	Kensington	40.64749
1	Jennifer	Manhattan	Midtown	40.75362
2	Elisabeth	Manhattan	Harlem	40.80902
3	LisaRoxanne	Brooklyn	Clinton Hill	40.68514
4	Laura	Manhattan	East Harlem	40.79851
5	Chris	Manhattan	Murray Hill	40.74767
6	Garon	Brooklyn	Bedford-Stuyvesant	40.68688
7	Shunichi	Manhattan	Hell's Kitchen	40.76489
8	MaryEllen	Manhattan	Upper West Side	40.80178
9	Ben	Manhattan	Chinatown	40.71344
10	Lena	Manhattan	Upper West Side	40.80316
11	Kate	Manhattan	Hell's Kitchen	40.76076
12	Laurie	Brooklyn	South Slope	40.66829
13	Claudio	Manhattan	Upper West Side	40.79826
14	Alina	Manhattan	West Village	40.73530
15	Allen & Irina	Brooklyn	Williamsburg	40.70837

16	Jane	Brooklyn	Fort Greene	40.69169
17	Doti	Manhattan	Chelsea	40.74192
18	Adam And Charity	Brooklyn	Crown Heights	40.67592
19	Sing	Manhattan	East Harlem	40.79685
20	Chaya	Brooklyn	Williamsburg	40.71842
21	Lisel	Brooklyn	Park Slope	40.68069
22	Lisel	Brooklyn	Park Slope	40.67989
23	Lisel	Brooklyn	Park Slope	40.68001
24	Nathalie	Brooklyn	Bedford-Stuyvesant	40.68371
25	Gregory	Brooklyn	Windsor Terrace	40.65599
26	Claude & Sophie	Manhattan	Inwood	40.86754
27	Tommi	Manhattan	Hell's Kitchen	40.76715
28	Shon	Manhattan	Inwood	40.86482
29	Dana	Manhattan	East Village	40.72920
...
48865	Brenda	Manhattan	Inwood	40.86845
48866	Alberth	Queens	Briarwood	40.70786
48867	Diana	Brooklyn	Gravesend	40.59080
48868	Diana	Brooklyn	Gravesend	40.59118
48869	Julia	Brooklyn	Bedford-Stuyvesant	40.68759
48870	Tanja	Brooklyn	Williamsburg	40.71197
48871	Ozzy Ciao	Manhattan	Harlem	40.82233
48872	Ben	Manhattan	Hell's Kitchen	40.76236
48873	Clement & Rose	Brooklyn	Flatlands	40.63116
48874	Jeffrey	Manhattan	East Harlem	40.79760
48875	Anastasia	Manhattan	East Harlem	40.78749
48876	Joseph	Manhattan	Harlem	40.80953
48877	Melanie	Brooklyn	Bushwick	40.70418
48878	Jeerathinan	Queens	Elmhurst	40.74477
48879	Lee	Brooklyn	Williamsburg	40.71728
48880	Melki	Brooklyn	Williamsburg	40.71232
48881	Adrien	Brooklyn	Greenpoint	40.72585
48882	Luisa	Brooklyn	Bushwick	40.69652
48883	Kendall	Manhattan	East Harlem	40.79755
48884	Jonathan	Brooklyn	Williamsburg	40.71790
48885	Kendall	Manhattan	East Harlem	40.79633
48886	Scott	Manhattan	Midtown	40.75561
48887	Melki	Brooklyn	Williamsburg	40.71232
48888	Kat	Manhattan	Hell's Kitchen	40.76392
48889	Michael	Queens	Jamaica	40.69137
48890	Sabrina	Brooklyn	Bedford-Stuyvesant	40.67853
48891	Marisol	Brooklyn	Bushwick	40.70184
48892	Ilgar & Aysel	Manhattan	Harlem	40.81475
48893	Taz	Manhattan	Hell's Kitchen	40.75751
48894	Christophe	Manhattan	Hell's Kitchen	40.76404

longitude room_type price minimum_nights number_of_reviews \

0	-73.97237	Private room	149	1	9
1	-73.98377	Entire home/apt	225	1	45
2	-73.94190	Private room	150	3	0
3	-73.95976	Entire home/apt	89	1	270
4	-73.94399	Entire home/apt	80	10	9
5	-73.97500	Entire home/apt	200	3	74
6	-73.95596	Private room	60	45	49
7	-73.98493	Private room	79	2	430
8	-73.96723	Private room	79	2	118
9	-73.99037	Entire home/apt	150	1	160
10	-73.96545	Entire home/apt	135	5	53
11	-73.98867	Private room	85	2	188
12	-73.98779	Private room	89	4	167
13	-73.96113	Private room	85	2	113
14	-74.00525	Entire home/apt	120	90	27
15	-73.95352	Entire home/apt	140	2	148
16	-73.97185	Entire home/apt	215	2	198
17	-73.99501	Private room	140	1	260
18	-73.94694	Entire home/apt	99	3	53
19	-73.94872	Entire home/apt	190	7	0
20	-73.95718	Entire home/apt	299	3	9
21	-73.97706	Private room	130	2	130
22	-73.97798	Private room	80	1	39
23	-73.97865	Private room	110	2	71
24	-73.94028	Entire home/apt	120	2	88
25	-73.97519	Private room	60	1	19
26	-73.92639	Private room	80	4	0
27	-73.98533	Entire home/apt	150	10	58
28	-73.92106	Private room	44	3	108
29	-73.98542	Entire home/apt	180	14	29
...
48865	-73.92449	Private room	80	1	0
48866	-73.81448	Entire home/apt	58	1	0
48867	-73.97116	Shared room	25	1	0
48868	-73.97119	Shared room	25	7	0
48869	-73.95705	Private room	45	4	0
48870	-73.94946	Entire home/apt	99	4	0
48871	-73.94687	Private room	35	29	0
48872	-73.99255	Entire home/apt	260	3	0
48873	-73.92616	Entire home/apt	170	1	0
48874	-73.93947	Private room	50	7	0
48875	-73.94749	Private room	140	1	0
48876	-73.95410	Private room	60	1	0
48877	-73.91471	Private room	42	7	0
48878	-73.87727	Private room	45	1	0
48879	-73.94394	Entire home/apt	120	20	0
48880	-73.94220	Entire home/apt	120	1	0

48881	-73.94001	Private room	54	6	0
48882	-73.91079	Private room	40	20	0
48883	-73.93614	Private room	75	2	0
48884	-73.96238	Private room	190	7	0
48885	-73.93605	Private room	75	2	0
48886	-73.96723	Entire home/apt	200	6	0
48887	-73.94220	Entire home/apt	170	1	0
48888	-73.99183	Private room	125	4	0
48889	-73.80844	Private room	65	1	0
48890	-73.94995	Private room	70	2	0
48891	-73.93317	Private room	40	4	0
48892	-73.94867	Entire home/apt	115	10	0
48893	-73.99112	Shared room	55	1	0
48894	-73.98933	Private room	90	7	0

	last_review	reviews_per_month	calculated_host_listings_count	\
0	2018-10-19	0.21	6	
1	2019-05-21	0.38	2	
2	NaN	NaN	1	
3	2019-07-05	4.64	1	
4	2018-11-19	0.10	1	
5	2019-06-22	0.59	1	
6	2017-10-05	0.40	1	
7	2019-06-24	3.47	1	
8	2017-07-21	0.99	1	
9	2019-06-09	1.33	4	
10	2019-06-22	0.43	1	
11	2019-06-23	1.50	1	
12	2019-06-24	1.34	3	
13	2019-07-05	0.91	1	
14	2018-10-31	0.22	1	
15	2019-06-29	1.20	1	
16	2019-06-28	1.72	1	
17	2019-07-01	2.12	1	
18	2019-06-22	4.44	1	
19	NaN	NaN	2	
20	2011-12-28	0.07	1	
21	2019-07-01	1.09	6	
22	2019-01-01	0.37	6	
23	2019-07-02	0.61	6	
24	2019-06-19	0.73	2	
25	2019-06-23	1.37	2	
26	NaN	NaN	1	
27	2017-08-13	0.49	1	
28	2019-06-15	1.11	3	
29	2019-04-19	0.24	1	
...	

48865	NaN	NaN	1
48866	NaN	NaN	1
48867	NaN	NaN	6
48868	NaN	NaN	6
48869	NaN	NaN	1
48870	NaN	NaN	1
48871	NaN	NaN	2
48872	NaN	NaN	1
48873	NaN	NaN	2
48874	NaN	NaN	1
48875	NaN	NaN	1
48876	NaN	NaN	1
48877	NaN	NaN	1
48878	NaN	NaN	5
48879	NaN	NaN	1
48880	NaN	NaN	3
48881	NaN	NaN	1
48882	NaN	NaN	1
48883	NaN	NaN	2
48884	NaN	NaN	1
48885	NaN	NaN	2
48886	NaN	NaN	1
48887	NaN	NaN	3
48888	NaN	NaN	1
48889	NaN	NaN	2
48890	NaN	NaN	2
48891	NaN	NaN	2
48892	NaN	NaN	1
48893	NaN	NaN	6
48894	NaN	NaN	1

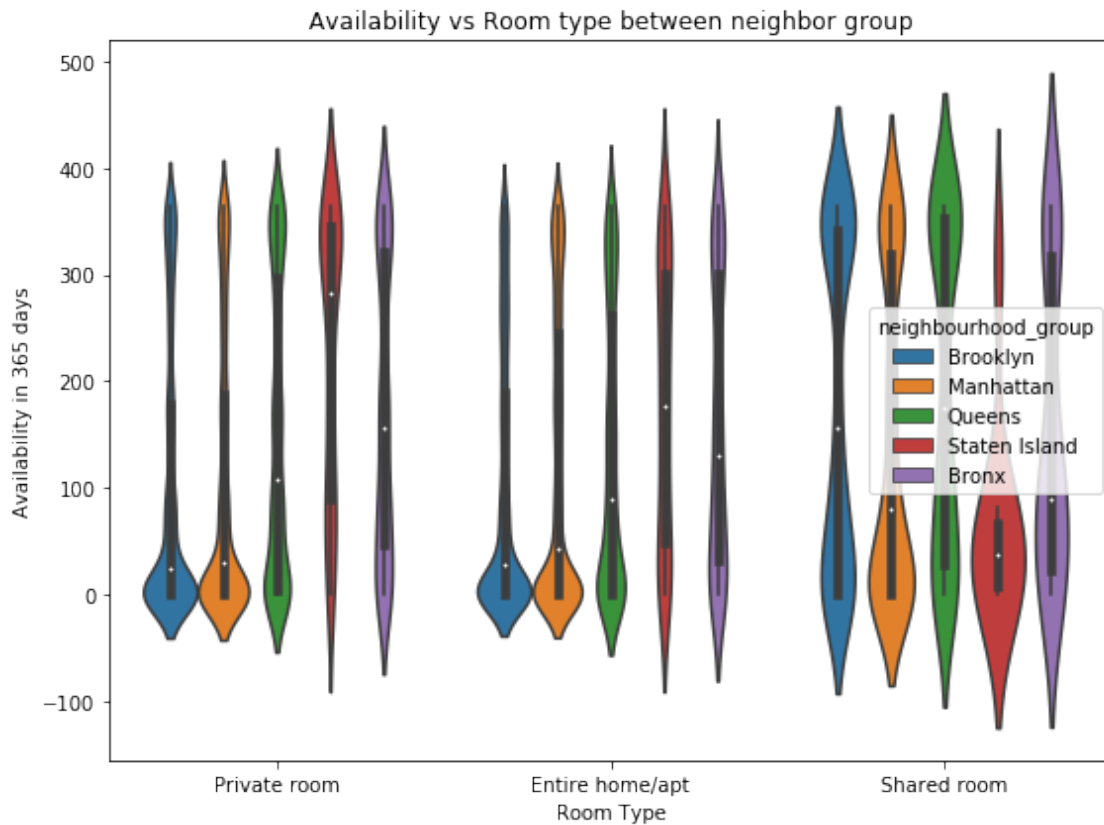
	availability_365
0	365
1	355
2	365
3	194
4	0
5	129
6	0
7	220
8	0
9	188
10	6
11	39
12	314
13	333
14	0

15	46
16	321
17	12
18	21
19	249
20	0
21	347
22	364
23	304
24	233
25	85
26	0
27	75
28	311
29	67
...	...
48865	79
48866	159
48867	338
48868	365
48869	7
48870	22
48871	31
48872	9
48873	363
48874	22
48875	180
48876	26
48877	16
48878	172
48879	22
48880	365
48881	15
48882	31
48883	364
48884	341
48885	353
48886	176
48887	365
48888	31
48889	163
48890	9
48891	36
48892	27
48893	2
48894	23

[48895 rows x 16 columns]

```
[38]: import seaborn as sns
import matplotlib.pyplot as plt

plt.figure(figsize=(8,6))
ax = sns.violinplot(x="room_type", y="availability_365", hue = "neighbourhood_group", data=df)
ax.set(xlabel='Room Type',
       ylabel="Availability in 365 days",
       title = "Availability vs Room type between neighbor group")
#plt.legend(bbox_to_anchor=(1.01, 1.25),
#           borderaxespad=0)
plt.tight_layout()
plt.savefig("Violin Plots.png",
           format='png',dpi=150)
```



```
[43]: top_reviewed_listings=df.nlargest(10,'number_of_reviews')
top_reviewed_listings
```

```
[43]:      id      name  host_id \
11759  9145202  Room near JFK Queen Bed  47621202
```


2031	903972		Great Bedroom in Manhattan	4734398
2030	903947		Beautiful Bedroom in Manhattan	4734398
2015	891117		Private Bedroom in Manhattan	4734398
13495	10101135		Room Near JFK Twin Beds	47621202
10623	8168619		Steps away from Laguardia airport	37312959
1879	834190		Manhattan Lux Loft.Like.Love.Lots.Look !	2369681
20403	16276632	Cozy Room Family Home LGA Airport NO CLEANING FEE		26432133
4870	3474320		Private brownstone studio Brooklyn	12949460
471	166172		LG Private Room/Family Friendly	792159

	host_name	neighbourhood_group	neighbourhood	latitude	longitude	\
11759	Dona	Queens	Jamaica	40.66730	-73.76831	
2031	Jj	Manhattan	Harlem	40.82085	-73.94025	
2030	Jj	Manhattan	Harlem	40.82124	-73.93838	
2015	Jj	Manhattan	Harlem	40.82264	-73.94041	
13495	Dona	Queens	Jamaica	40.66939	-73.76975	
10623	Maya	Queens	East Elmhurst	40.77006	-73.87683	
1879	Carol	Manhattan	Lower East Side	40.71921	-73.99116	
20403	Danielle	Queens	East Elmhurst	40.76335	-73.87007	
4870	Asa	Brooklyn	Park Slope	40.67926	-73.97711	
471	Wanda	Brooklyn	Bushwick	40.70283	-73.92131	

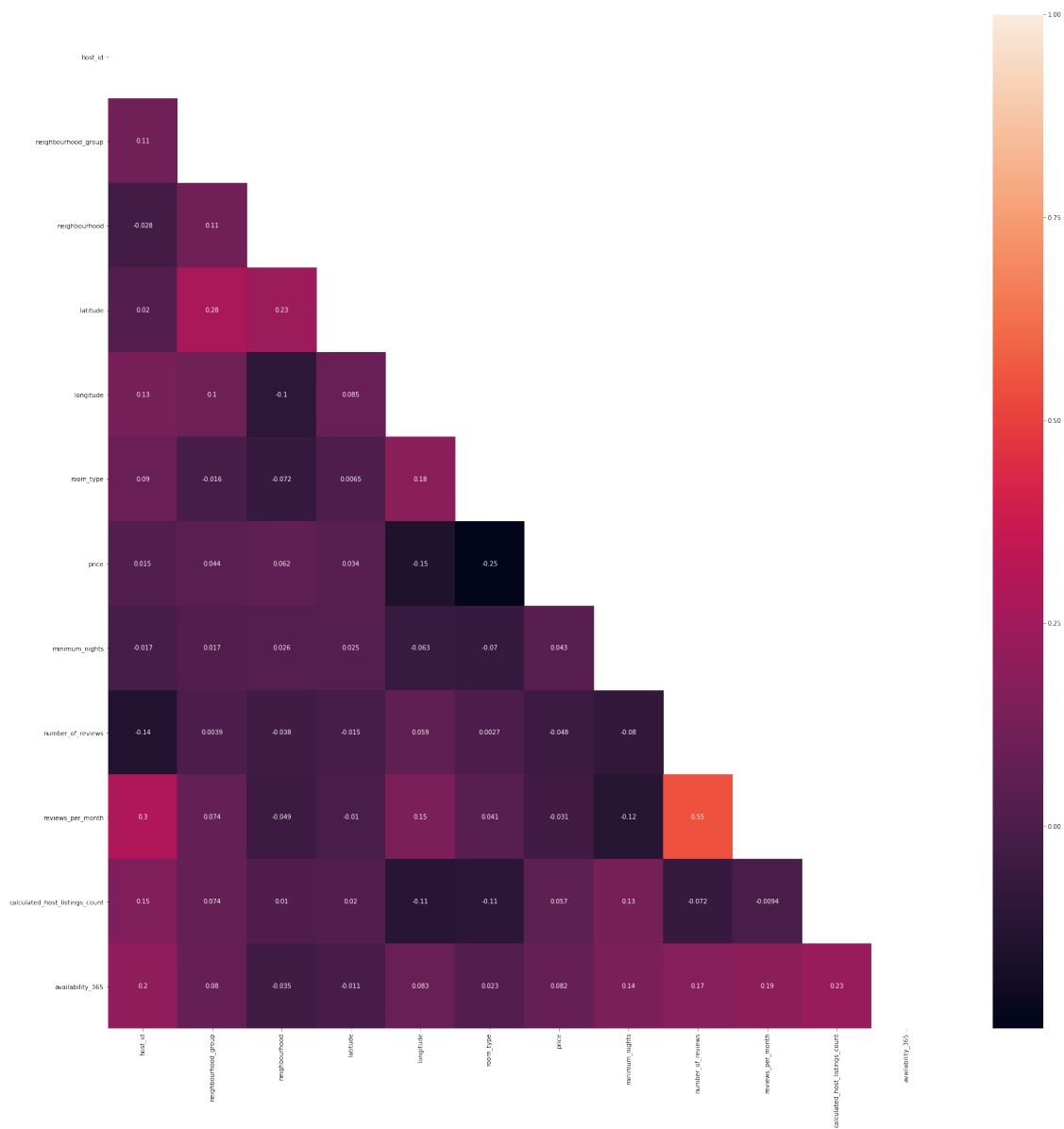
	room_type	price	minimum_nights	number_of_reviews	last_review	\
11759	Private room	47	1	629	2019-07-05	
2031	Private room	49	1	607	2019-06-21	
2030	Private room	49	1	597	2019-06-23	
2015	Private room	49	1	594	2019-06-15	
13495	Private room	47	1	576	2019-06-27	
10623	Private room	46	1	543	2019-07-01	
1879	Private room	99	2	540	2019-07-06	
20403	Private room	48	1	510	2019-07-06	
4870	Entire home/apt	160	1	488	2019-07-01	
471	Private room	60	3	480	2019-07-07	

	reviews_per_month	calculated_host_listings_count	availability_365
11759	14.58	2	333
2031	7.75	3	293
2030	7.72	3	342
2015	7.57	3	339
13495	13.40	2	173
10623	11.59	5	163
1879	6.95	1	179
20403	16.22	5	341
4870	8.14	1	269
471	6.70	1	0

```
[66]: df = pd.DataFrame(df)
df['neighbourhood_group'] =df['neighbourhood_group'].astype('category').cat.
      ↪codes
df['neighbourhood'] =df['neighbourhood'].astype('category').cat.codes
df['room_type'] =df['room_type'].astype('category').cat.codes
#df = df.drop(columns = "id")
plt.figure(figsize=(30, 30))

# lower triangle only
mask = np.triu(np.ones_like(df.corr(), dtype=np.bool))
# lower triangle only

lol =sns.heatmap(df.corr(),mask =mask, annot=True)
figure = lol.get_figure()
figure.savefig('svm_conf.png', dpi=200)
```



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[ ]:
```