

```
display.Image("https://recipemarker.com/wp-content/uploads/2021/08/Best-Red-Bull-Flavors-Featured-Image-1024x683.jpg", width = 1200, height = 300)
```



Account Data Analysis

Analyze data about accounts to identify key trends and opportunities for sales growth and communicate your insights.

Overcoming Sales Objections

Respond to objections raised during the sales process to help close the sale.

#Total sales by Account Type and Year.
#Sales growth/trends by Account Type.
#Sales growth/trends by Year.
#Best and worst performing accounts (overall, and by account type).
#Effect of assortment (product lines) presence on sales.
#Effectiveness of the different marketing/promotion programs.

1. Data processing

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import matplotlib.colors as mcolors
from IPython import display

df = pd.read_excel('/Users/Yedou/Documents/Account Sales Data for Analysis v2.xlsx', header=3)
```

```
df
```

| | Account Name | Account Address \ |
|---|--------------|--|
| 0 | Bar 1 | 2131 Patterson Road, Brooklyn NY 11201 |
| 1 | Bar 2 | 3685 Morningview Lane, New York NY 10013 |
| 2 | Bar 3 | 2285 Ladybug Drive, New York NY 10013 |
| 3 | Bar 4 | 2930 Southern Street, New York NY 10005 |
| 4 | Bar 5 | 2807 Geraldine Lane, New York NY 10004 |

| | | | |
|----|----------------|--|-------|
| 5 | Bar 6 | 7778 Cherry Road, Bronx NY | 10467 |
| 6 | Bar 7 | 48 Winchester Avenue, New York NY | 10024 |
| 7 | Bar 8 | 8735 Squaw Creek Drive, Brooklyn NY | 11214 |
| 8 | Bar 9 | 267 Third Road, New York NY | 10034 |
| 9 | Bar 10 | 102 Coffee Court, Bronx NY | 10461 |
| 10 | Bar 11 | 44 W. Pheasant Street, Brooklyn NY | 11233 |
| 11 | Bar 12 | 7488 N. Marconi Ave, Brooklyn NY | 11237 |
| 12 | Bar 13 | 9575 Shipley Court, Brooklyn NY | 11201 |
| 13 | Bar 14 | 8156 Lake View Street, New York, NY | 10025 |
| 14 | Bar 15 | 44 Madison Dr, New York NY | 10032 |
| 15 | Restaurant 1 | 9848 Linden St, New York NY | 10011 |
| 16 | Restaurant 2 | 805 South Pilgrim Court, Brooklyn NY | 11225 |
| 17 | Restaurant 3 | 9132 Redwood Rd, Bronx NY | 10466 |
| 18 | Restaurant 4 | 3 Warren Drive, New York NY | 10040 |
| 19 | Restaurant 5 | 402 Bridgeton Lane, Bronx NY | 10468 |
| 20 | Restaurant 6 | 6 E. Nichols Ave, New York NY | 10027 |
| 21 | Restaurant 7 | 323 North Edgewood St, Bronx NY | 10457 |
| 22 | Restaurant 8 | 484 Thorne St, New York NY | 10128 |
| 23 | Restaurant 9 | 861 Gonzales Lane, Bronx NY | 10472 |
| 24 | Restaurant 10 | 267 Randall Mill Dr, New York NY | 10033 |
| 25 | Restaurant 11 | 12 Lees Creek St, Brooklyn NY | 11211 |
| 26 | Restaurant 12 | 240 W. Manhattan St, Bronx NY | 10462 |
| 27 | Restaurant 13 | 62 Lower River Road, Staten Island, NY | 10306 |
| 28 | Restaurant 14 | 48 S. Brandywine St, New York NY | 10002 |
| 29 | Restaurant 15 | 5 Tallwood St, Brooklyn NY | 11233 |
| 30 | Nightclub 1 | 77 Stillwater St, Brooklyn NY | 11213 |
| 31 | Nightclub 2 | 7061 Bishop St, Yonkers NY | 10701 |
| 32 | Nightclub 3 | 7223 Cedarwood Ave, Brooklyn NY | 11221 |
| 33 | Nightclub 4 | 62 Lafayette Ave, Bronx NY | 10462 |
| 34 | Nightclub 5 | 7839 Elm St, Staten Island NY | 10306 |
| 35 | Nightclub 6 | 429 Stonybrook Dr, Brooklyn NY | 11203 |
| 36 | Nightclub 7 | 640 Beechwood Dr, Bronx NY | 10461 |
| 37 | Nightclub 8 | 9453 N. Wagon Lane, Brooklyn NY | 11237 |
| 38 | Nightclub 9 | 81 San Carlos Road, Bronx NY | 10463 |
| 39 | Nightclub 10 | 596 Coffee St, Bronx NY | 10472 |
| 40 | Nightclub 11 | 92 Princess St, New York NY | 10033 |
| 41 | Nightclub 12 | 9151 River St, Brooklyn NY | 11230 |
| 42 | Nightclub 13 | 424 Hall Ave, New York NY | 10128 |
| 43 | Nightclub 14 | 81 Crescent St, Brooklyn NY | 11210 |
| 44 | Nightclub 15 | 7217 Birch Hill Dr, New York NY | 10009 |
| 45 | Event Venue 1 | 7184 Center Court, Brooklyn NY | 11208 |
| 46 | Event Venue 2 | 815 2nd St, New York NY | 10028 |
| 47 | Event Venue 3 | 9875 Franklin Rd, Brooklyn NY | 11223 |
| 48 | Event Venue 4 | 601 Bank Ave, Brooklyn NY | 11218 |
| 49 | Event Venue 5 | 21 Yukon St, Bronx NY | 10451 |
| 50 | Event Venue 6 | 18 N. Woodland Ave, New York NY | 10025 |
| 51 | Event Venue 7 | 65 Lower River Ave, Bronx NY | 10465 |
| 52 | Event Venue 8 | 8680 Alderwood St, New York NY | 10032 |
| 53 | Event Venue 9 | 8388 Gonzales St, Brooklyn NY | 11228 |
| 54 | Event Venue 10 | 9760 Taylor Dr, Brooklyn NY | 11211 |

| | | |
|----|----------------|--|
| 55 | Event Venue 11 | 419 E. Henry Ave, New York NY 10031 |
| 56 | Event Venue 12 | 8083 8th St, Brooklyn NY 11209 |
| 57 | Event Venue 13 | 2 Rock Maple Ave, New York NY 10029 |
| 58 | Event Venue 14 | 9577 Nicolls Ave, Staten Island NY 10312 |
| 59 | Event Venue 15 | 174 Del Monte St, Brooklyn NY 11224 |

| | Decision Maker | Phone Number | Account Type | Regular | Sugar | Free |
|----|-------------------|----------------|--------------|---------|-------|------|
| \ | | | | | | |
| 0 | Dorothy Rizzo | (880) 283-6803 | Bar | Yes | | Yes |
| 1 | Lawson Moore | (711) 426-7350 | Bar | Yes | | Yes |
| 2 | Vin Hudson | (952) 952-5573 | Bar | Yes | | Yes |
| 3 | Susana Huels | (491) 505-6064 | Bar | Yes | | Yes |
| 4 | Shanna Hettinger | (412) 570-0596 | Bar | Yes | | Yes |
| 5 | Roy McGlynn | (594) 807-4187 | Bar | Yes | | Yes |
| 6 | Lorena Posacco | (678) 294-8103 | Bar | Yes | | No |
| 7 | Juanita Wisozk | (305) 531-1310 | Bar | Yes | | Yes |
| 8 | Velma Riley | (697) 543-0310 | Bar | Yes | | No |
| 9 | Holly Gaines | (277) 456-4626 | Bar | Yes | | Yes |
| 10 | Gary Brown | (459) 968-9453 | Bar | Yes | | No |
| 11 | Jeffrey Akins | (313) 417-8968 | Bar | Yes | | No |
| 12 | Tim Young | (876) 653-1727 | Bar | Yes | | Yes |
| 13 | Debra Kroll | (628) 832-4986 | Bar | Yes | | Yes |
| 14 | Kelly Boyd | (220) 929-0797 | Bar | Yes | | Yes |
| 15 | Dan Hill | (248) 450-0797 | Restaurant | Yes | | Yes |
| 16 | Javier George | (964) 214-3742 | Restaurant | Yes | | Yes |
| 17 | Christopher Evans | (831) 406-6300 | Restaurant | Yes | | Yes |
| 18 | Julie Ross | (778) 387-0744 | Restaurant | Yes | | Yes |
| 19 | Bill Callahan | (617) 419-7996 | Restaurant | Yes | | Yes |

| | | | | | | |
|----|-------------------|-------|----------|------------|-----|-----|
| 20 | Anthony Brooks | (349) | 801-7566 | Restaurant | Yes | Yes |
| 21 | Charlotte Leroux | (784) | 634-6873 | Restaurant | Yes | Yes |
| 22 | Nina Coulter | (938) | 752-9381 | Restaurant | Yes | No |
| 23 | Mia Ang | (253) | 861-1301 | Restaurant | Yes | Yes |
| 24 | Kathy Rogers | (939) | 738-6471 | Restaurant | Yes | Yes |
| 25 | Rita Varga | (754) | 696-3109 | Restaurant | Yes | No |
| 26 | Mel Berkowitz | (967) | 547-1542 | Restaurant | Yes | Yes |
| 27 | Debra Martin | (743) | 960-6716 | Restaurant | Yes | Yes |
| 28 | Deshaun Fletcher | (845) | 304-6511 | Restaurant | Yes | Yes |
| 29 | Kari Lenz | (886) | 554-5339 | Restaurant | Yes | Yes |
| 30 | John Mackey | (831) | 581-1892 | Club | Yes | Yes |
| 31 | Raymond Heywin | (571) | 843-1746 | Club | Yes | Yes |
| 32 | Janie Roberson | (924) | 516-6566 | Club | Yes | Yes |
| 33 | Brooke Hayes | (247) | 999-3394 | Club | Yes | Yes |
| 34 | Lee Niemeyer | (920) | 451-3973 | Club | Yes | Yes |
| 35 | Stephen Harris | (258) | 948-7479 | Club | Yes | Yes |
| 36 | Juan Scott | (357) | 532-0838 | Club | Yes | Yes |
| 37 | Kurt Issacs | (454) | 903-5770 | Club | Yes | No |
| 38 | Dominique Johnson | (336) | 448-7026 | Club | Yes | Yes |
| 39 | Larry Alaimo | (242) | 869-1226 | Club | Yes | Yes |
| 40 | Carlos Moya | (485) | 453-8693 | Club | Yes | No |
| 41 | Shaun Salvatore | (691) | 657-1498 | Club | Yes | Yes |
| 42 | Annie Fuentes | (462) | 693-6254 | Club | Yes | Yes |
| 43 | Maria Sawyer | (881) | 243-5276 | Club | Yes | Yes |

| | | | | | | |
|----|--------------------|-------|----------|-------|-----|-----|
| 44 | Darnell Straughter | (680) | 628-4625 | Club | Yes | Yes |
| 45 | Richard Breaux | (685) | 981-8556 | Hotel | Yes | No |
| 46 | Craig Collins | (828) | 840-2736 | Hotel | Yes | Yes |
| 47 | Donna Lam | (931) | 618-9558 | Hotel | Yes | Yes |
| 48 | Teresa Vasbinder | (261) | 690-0303 | Hotel | Yes | No |
| 49 | Andre Mobley | (597) | 701-9429 | Hotel | Yes | Yes |
| 50 | Ray Hernandez | (609) | 345-8163 | Hotel | Yes | Yes |
| 51 | Thomas Stewart | (381) | 643-1230 | Hotel | Yes | Yes |
| 52 | Henry Lange | (293) | 473-1512 | Hotel | Yes | Yes |
| 53 | Danielle Tomas | (459) | 261-2301 | Hotel | Yes | Yes |
| 54 | Joe Schimke | (936) | 816-9148 | Hotel | Yes | No |
| 55 | Carlos Jackson | (201) | 363-0653 | Hotel | Yes | Yes |
| 56 | Russell Wallace | (237) | 890-0247 | Hotel | Yes | No |
| 57 | Shameka West | (488) | 656-0761 | Hotel | Yes | Yes |
| 58 | Kevin Fleming | (650) | 848-8284 | Hotel | Yes | Yes |
| 59 | Anna Grey | (980) | 437-1451 | Hotel | Yes | Yes |

Yellow Edition Cooler? Digital screen? Menu inclusion? Posters?

| | | | | | |
|--------|-----|-----|-----|-----|-----|
| 2017 \ | | | | | |
| 0 | Yes | Yes | Yes | Yes | Yes |
| 1982 | | | | | |
| 1 | Yes | No | Yes | Yes | Yes |
| 2786 | | | | | |
| 2 | Yes | Yes | Yes | Yes | Yes |
| 1209 | | | | | |
| 3 | Yes | Yes | Yes | Yes | Yes |
| 906 | | | | | |
| 4 | No | Yes | Yes | Yes | Yes |
| 1421 | | | | | |
| 5 | Yes | No | Yes | Yes | No |
| 2341 | | | | | |
| 6 | No | No | No | Yes | No |

| | | | | | |
|------|-----|-----|-----|-----|-----|
| 9252 | | | | | |
| 7 | Yes | Yes | No | Yes | No |
| 1581 | | | | | |
| 8 | No | No | No | Yes | No |
| 9766 | | | | | |
| 9 | No | Yes | No | Yes | No |
| 1530 | | | | | |
| 10 | No | No | No | No | No |
| 7555 | | | | | |
| 11 | No | No | No | No | No |
| 1532 | | | | | |
| 12 | Yes | Yes | Yes | Yes | Yes |
| 24 | | | | | |
| 13 | Yes | Yes | Yes | Yes | Yes |
| 861 | | | | | |
| 14 | No | No | No | No | No |
| 9058 | | | | | |
| 15 | No | No | No | No | No |
| 3501 | | | | | |
| 16 | No | No | No | No | No |
| 3916 | | | | | |
| 17 | No | Yes | No | Yes | No |
| 700 | | | | | |
| 18 | No | No | No | No | No |
| 9773 | | | | | |
| 19 | No | Yes | No | Yes | No |
| 73 | | | | | |
| 20 | No | Yes | No | Yes | No |
| 238 | | | | | |
| 21 | No | Yes | No | Yes | No |
| 1368 | | | | | |
| 22 | No | No | Yes | No | No |
| 8331 | | | | | |
| 23 | No | Yes | Yes | Yes | No |
| 1779 | | | | | |
| 24 | No | Yes | Yes | Yes | No |
| 570 | | | | | |
| 25 | No | No | Yes | No | No |
| 6156 | | | | | |
| 26 | No | Yes | Yes | Yes | No |
| 209 | | | | | |
| 27 | No | No | No | No | No |
| 6309 | | | | | |
| 28 | No | Yes | No | Yes | No |
| 712 | | | | | |
| 29 | No | No | No | No | No |
| 2390 | | | | | |
| 30 | Yes | No | No | Yes | No |
| 2519 | | | | | |
| 31 | Yes | Yes | Yes | Yes | No |

| | | | | | |
|------|-----|-----|-----|-----|-----|
| 138 | | | | | |
| 32 | Yes | No | No | Yes | Yes |
| 8873 | | | | | |
| 33 | Yes | No | No | Yes | Yes |
| 3297 | | | | | |
| 34 | Yes | Yes | Yes | Yes | Yes |
| 1092 | | | | | |
| 35 | Yes | No | No | Yes | Yes |
| 2541 | | | | | |
| 36 | Yes | Yes | Yes | Yes | Yes |
| 742 | | | | | |
| 37 | No | No | No | Yes | Yes |
| 7703 | | | | | |
| 38 | Yes | Yes | Yes | Yes | Yes |
| 488 | | | | | |
| 39 | Yes | Yes | Yes | Yes | Yes |
| 376 | | | | | |
| 40 | No | No | No | Yes | Yes |
| 7840 | | | | | |
| 41 | Yes | Yes | Yes | Yes | Yes |
| 1038 | | | | | |
| 42 | No | No | No | No | No |
| 8891 | | | | | |
| 43 | Yes | Yes | No | No | No |
| 1290 | | | | | |
| 44 | Yes | Yes | Yes | No | No |
| 431 | | | | | |
| 45 | No | No | No | Yes | No |
| 8156 | | | | | |
| 46 | Yes | Yes | No | Yes | No |
| 299 | | | | | |
| 47 | Yes | No | No | Yes | No |
| 1323 | | | | | |
| 48 | No | No | No | Yes | No |
| 8466 | | | | | |
| 49 | Yes | No | No | Yes | No |
| 870 | | | | | |
| 50 | Yes | No | No | Yes | No |
| 1497 | | | | | |
| 51 | Yes | No | No | Yes | No |
| 1082 | | | | | |
| 52 | No | No | No | Yes | No |
| 9791 | | | | | |
| 53 | Yes | No | No | Yes | No |
| 1357 | | | | | |
| 54 | No | No | No | Yes | No |
| 576 | | | | | |
| 55 | Yes | Yes | No | No | No |
| 128 | | | | | |
| 56 | No | No | No | No | No |

| | | | | | |
|------|-----|----|----|----|----|
| 8034 | | | | | |
| 57 | Yes | No | No | No | No |
| 1263 | | | | | |
| 58 | Yes | No | No | No | No |
| 1032 | | | | | |
| 59 | Yes | No | No | No | No |
| 1014 | | | | | |

| | | | | |
|----|------|------|------|------|
| | 2018 | 2019 | 2020 | 2021 |
| 0 | 5388 | 7063 | 7208 | 9093 |
| 1 | 3804 | 4121 | 6210 | 6909 |
| 2 | 1534 | 1634 | 4302 | 9768 |
| 3 | 1251 | 2897 | 4499 | 9428 |
| 4 | 1893 | 2722 | 4410 | 5873 |
| 5 | 6105 | 7777 | 7891 | 8758 |
| 6 | 8499 | 991 | 448 | 211 |
| 7 | 4799 | 6582 | 9024 | 9759 |
| 8 | 8049 | 5556 | 5202 | 2373 |
| 9 | 1620 | 2027 | 4881 | 6002 |
| 10 | 6551 | 5188 | 3436 | 2359 |
| 11 | 2678 | 4068 | 4278 | 5382 |
| 12 | 1797 | 3548 | 3668 | 8592 |
| 13 | 1314 | 1810 | 6510 | 9271 |
| 14 | 4839 | 4776 | 4024 | 369 |
| 15 | 7079 | 7438 | 7443 | 9225 |
| 16 | 4218 | 5072 | 5201 | 7588 |
| 17 | 5721 | 6247 | 8495 | 9236 |
| 18 | 9179 | 8390 | 8256 | 3815 |
| 19 | 3485 | 4592 | 5143 | 8100 |
| 20 | 1235 | 1822 | 7074 | 8207 |
| 21 | 3447 | 4535 | 5476 | 9983 |
| 22 | 7667 | 5952 | 1998 | 375 |
| 23 | 2124 | 2844 | 6877 | 9570 |
| 24 | 1322 | 7279 | 8443 | 9571 |
| 25 | 6110 | 5791 | 1759 | 969 |
| 26 | 621 | 3098 | 7118 | 8433 |
| 27 | 6227 | 5123 | 4968 | 3857 |
| 28 | 4182 | 6087 | 7494 | 8599 |
| 29 | 2415 | 3461 | 3850 | 4657 |
| 30 | 3938 | 5190 | 8203 | 8780 |
| 31 | 286 | 6750 | 8254 | 8656 |
| 32 | 8484 | 7883 | 7499 | 6592 |
| 33 | 4866 | 4928 | 8451 | 9585 |
| 34 | 3140 | 4123 | 4366 | 9482 |
| 35 | 3794 | 3984 | 8803 | 9338 |
| 36 | 3751 | 4423 | 8733 | 9909 |
| 37 | 6957 | 3898 | 1857 | 1512 |
| 38 | 5535 | 5775 | 7661 | 9206 |
| 39 | 889 | 4373 | 6803 | 7578 |
| 40 | 5804 | 4259 | 4243 | 907 |


```

41 3615 3712 5819 9589
42 5952 5914 5405 4031
43 4033 6956 7929 8834
44 6231 7478 8039 8271
45 1245 791 338 44
46 657 6238 8922 9081
47 4963 6292 6728 8202
48 4079 2797 2245 1696
49 2428 7386 8835 9766
50 1768 2804 5718 9822
51 3353 6351 8550 9272
52 9610 7534 5080 4936
53 4189 5407 6233 9681
54 2628 3612 5066 5156
55 416 747 1028 6357
56 6541 3311 3254 2687
57 2517 8042 8222 9686
58 3919 4466 5568 6476
59 2254 4534 6796 7730

```

```

#df4 = df1[(df1["From Full Address"].str.contains("KS|MO|Kansas|
Missouri",case=False)) & (df1["To Full Address"].str.contains("KS|MO|
Kansas|Missouri",case=False))]
# df[df['A'].str.contains("hello")] Account Name
dfBars = df[df['Account Name'].str.contains("Bar")]

```

dfBars

| | Account Name | Account Address | Decision |
|---|--------------|---|----------|
| 0 | Bar 1 | 2131 Patterson Road, Brooklyn NY 11201 | Dorothy |
| 1 | Bar 2 | 3685 Morningview Lane, New York NY 10013 | Lawson |
| 2 | Bar 3 | 2285 Ladybug Drive, New York NY 10013 | Vin |
| 3 | Bar 4 | 2930 Southern Street, New York NY 10005 | Susana |
| 4 | Bar 5 | 2807 Geraldine Lane, New York NY 10004 | Shanna |
| 5 | Bar 6 | 7778 Cherry Road, Bronx NY 10467 | Roy |
| 6 | Bar 7 | 48 Winchester Avenue, New York NY 10024 | Lorena |
| 7 | Bar 8 | 8735 Squaw Creek Drive, Brooklyn NY 11214 | Juanita |
| 8 | Bar 9 | 267 Third Road, New York NY 10034 | Velma |
| 9 | Bar 10 | 102 Coffee Court, Bronx NY 10461 | Holly |

| | | | |
|------------------|--------|---|---------|
| 10 Brown | Bar 11 | 44 W. Pheasant Street, Brooklyn NY 11233 | Gary |
| 11 Akina | Bar 12 | 7488 N. Marconi Ave, Brooklyn NY 11237 | Jeffrey |
| 12 Young | Bar 13 | 9575 Shipley Court, Brooklyn NY 11201 | Tim |
| 13 Kroll | Bar 14 | 8156 Lake View Street, New York, NY 10025 | Debra |
| 14 Kelly Boyd | Bar 15 | 44 Madison Dr, New York NY 10032 | |

| | Phone Number | Account Type | Regular | Sugar Free | Yellow Edition |
|----------------|----------------|--------------|---------|------------|----------------|
| 0 Cooler? \ | (880) 283-6803 | Bar | Yes | Yes | Yes |
| 1 Yes | (711) 426-7350 | Bar | Yes | Yes | Yes |
| 2 No | (952) 952-5573 | Bar | Yes | Yes | Yes |
| 3 Yes | (491) 505-6064 | Bar | Yes | Yes | Yes |
| 4 Yes | (412) 570-0596 | Bar | Yes | Yes | No |
| 5 No | (594) 807-4187 | Bar | Yes | Yes | Yes |
| 6 No | (678) 294-8103 | Bar | Yes | No | No |
| 7 Yes | (305) 531-1310 | Bar | Yes | Yes | Yes |
| 8 No | (697) 543-0310 | Bar | Yes | No | No |
| 9 Yes | (277) 456-4626 | Bar | Yes | Yes | No |
| 10 No | (459) 968-9453 | Bar | Yes | No | No |
| 11 No | (313) 417-8968 | Bar | Yes | No | No |
| 12 Yes | (876) 653-1727 | Bar | Yes | Yes | Yes |
| 13 Yes | (628) 832-4986 | Bar | Yes | Yes | Yes |
| 14 No | (220) 929-0797 | Bar | Yes | Yes | No |

| | Digital screen? | Menu inclusion? | Posters? | 2017 | 2018 | 2019 | 2020 |
|-----------|-----------------|-----------------|----------|------|------|------|------|
| 0 2021 | Yes | Yes | Yes | 1982 | 5388 | 7063 | 7208 |
| 1 9093 | Yes | Yes | Yes | 2786 | 3804 | 4121 | 6210 |
| 6909 | | | | | | | |

| | | | | | | | |
|------|-----|-----|-----|------|------|------|------|
| 2 | Yes | Yes | Yes | 1209 | 1534 | 1634 | 4302 |
| 9768 | | | | | | | |
| 3 | Yes | Yes | Yes | 906 | 1251 | 2897 | 4499 |
| 9428 | | | | | | | |
| 4 | Yes | Yes | Yes | 1421 | 1893 | 2722 | 4410 |
| 5873 | | | | | | | |
| 5 | Yes | Yes | No | 2341 | 6105 | 7777 | 7891 |
| 8758 | | | | | | | |
| 6 | No | Yes | No | 9252 | 8499 | 991 | 448 |
| 211 | | | | | | | |
| 7 | No | Yes | No | 1581 | 4799 | 6582 | 9024 |
| 9759 | | | | | | | |
| 8 | No | Yes | No | 9766 | 8049 | 5556 | 5202 |
| 2373 | | | | | | | |
| 9 | No | Yes | No | 1530 | 1620 | 2027 | 4881 |
| 6002 | | | | | | | |
| 10 | No | No | No | 7555 | 6551 | 5188 | 3436 |
| 2359 | | | | | | | |
| 11 | No | No | No | 1532 | 2678 | 4068 | 4278 |
| 5382 | | | | | | | |
| 12 | Yes | Yes | Yes | 24 | 1797 | 3548 | 3668 |
| 8592 | | | | | | | |
| 13 | Yes | Yes | Yes | 861 | 1314 | 1810 | 6510 |
| 9271 | | | | | | | |
| 14 | No | No | No | 9058 | 4839 | 4776 | 4024 |
| 369 | | | | | | | |

```
dfBarsTable = dfBars[['Account Name', 2017,2018,2019,2020,2021]]
```

```
dfBarsTable_setindex = dfBarsTable.set_index('Account Name')
```

```
A = dfBarsTable_setindex
```

```
A['Total_Sales Quantity/Bar/Account Name'] =  
dfBarsTable_setindex.sum(axis=1)
```

```
A
```

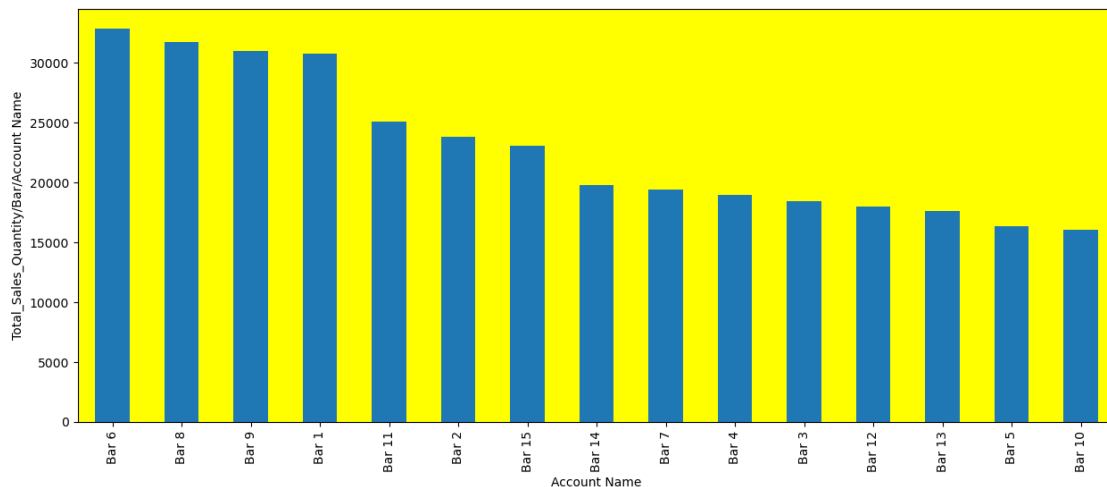
| | 2017 | 2018 | 2019 | 2020 | 2021 | \ |
|--------------|------|------|------|------|------|---|
| Account Name | | | | | | |
| Bar 1 | 1982 | 5388 | 7063 | 7208 | 9093 | |
| Bar 2 | 2786 | 3804 | 4121 | 6210 | 6909 | |
| Bar 3 | 1209 | 1534 | 1634 | 4302 | 9768 | |
| Bar 4 | 906 | 1251 | 2897 | 4499 | 9428 | |
| Bar 5 | 1421 | 1893 | 2722 | 4410 | 5873 | |
| Bar 6 | 2341 | 6105 | 7777 | 7891 | 8758 | |
| Bar 7 | 9252 | 8499 | 991 | 448 | 211 | |
| Bar 8 | 1581 | 4799 | 6582 | 9024 | 9759 | |
| Bar 9 | 9766 | 8049 | 5556 | 5202 | 2373 | |
| Bar 10 | 1530 | 1620 | 2027 | 4881 | 6002 | |

| | | | | | |
|--------|------|------|------|------|------|
| Bar 11 | 7555 | 6551 | 5188 | 3436 | 2359 |
| Bar 12 | 1532 | 2678 | 4068 | 4278 | 5382 |
| Bar 13 | 24 | 1797 | 3548 | 3668 | 8592 |
| Bar 14 | 861 | 1314 | 1810 | 6510 | 9271 |
| Bar 15 | 9058 | 4839 | 4776 | 4024 | 369 |

| Account Name | Total_Sales Quantity/Bar/Account Name |
|--------------|---------------------------------------|
| Bar 1 | 30734 |
| Bar 2 | 23830 |
| Bar 3 | 18447 |
| Bar 4 | 18981 |
| Bar 5 | 16319 |
| Bar 6 | 32872 |
| Bar 7 | 19401 |
| Bar 8 | 31745 |
| Bar 9 | 30946 |
| Bar 10 | 16060 |
| Bar 11 | 25089 |
| Bar 12 | 17938 |
| Bar 13 | 17629 |
| Bar 14 | 19766 |
| Bar 15 | 23066 |

```
A.sort_values(by='Total_Sales Quantity/Bar/Account Name',
ascending=False)
```

```
ax = A.sort_values(by='Total_Sales Quantity/Bar/Account Name',
ascending=False)['Total_Sales Quantity/Bar/Account
Name'].plot.bar(figsize=(15,6))
ax.set_facecolor("yellow")
plt.ylabel('Total_Sales_Quantity/Bar/Account Name')
plt.show()
```



```
A[2021].sort_values(ascending=False)
```

```
Account Name
```

```
Bar 3      9768
Bar 8      9759
Bar 4      9428
Bar 14     9271
Bar 1       9093
Bar 6      8758
Bar 13     8592
Bar 2      6909
Bar 10     6002
Bar 5      5873
Bar 12     5382
Bar 9      2373
Bar 11     2359
Bar 15      369
Bar 7       211
```

```
Name: 2021, dtype: int64
```

```
DataFrameBar =
```

```
pd.DataFrame(A[2021].sort_values(ascending=False)).reset_index()
```

```
DataFrameBar
```

| | Account Name | 2021 |
|----|--------------|------|
| 0 | Bar 3 | 9768 |
| 1 | Bar 8 | 9759 |
| 2 | Bar 4 | 9428 |
| 3 | Bar 14 | 9271 |
| 4 | Bar 1 | 9093 |
| 5 | Bar 6 | 8758 |
| 6 | Bar 13 | 8592 |
| 7 | Bar 2 | 6909 |
| 8 | Bar 10 | 6002 |
| 9 | Bar 5 | 5873 |
| 10 | Bar 12 | 5382 |
| 11 | Bar 9 | 2373 |
| 12 | Bar 11 | 2359 |
| 13 | Bar 15 | 369 |
| 14 | Bar 7 | 211 |

```
input = 15
```

```
output = list(range(input + 1))
```

```
print(output)
```

```
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15]
```

```
pop_0 = output.pop(0)
```

```
DataFrameBar['Rank'] = output
```

```
DataFrameBar
```

| | Account Name | 2021 | Rank |
|----|--------------|------|------|
| 0 | Bar 3 | 9768 | 1 |
| 1 | Bar 8 | 9759 | 2 |
| 2 | Bar 4 | 9428 | 3 |
| 3 | Bar 14 | 9271 | 4 |
| 4 | Bar 1 | 9093 | 5 |
| 5 | Bar 6 | 8758 | 6 |
| 6 | Bar 13 | 8592 | 7 |
| 7 | Bar 2 | 6909 | 8 |
| 8 | Bar 10 | 6002 | 9 |
| 9 | Bar 5 | 5873 | 10 |
| 10 | Bar 12 | 5382 | 11 |
| 11 | Bar 9 | 2373 | 12 |
| 12 | Bar 11 | 2359 | 13 |
| 13 | Bar 15 | 369 | 14 |
| 14 | Bar 7 | 211 | 15 |

```
DataFrameBarRank = DataFrameBar[['Rank', 'Account Name', 2021]]
```

```
#DataFrameBarRank
```

```
DataFrameBarRank.rename(columns={'Account Name': 'Bar_Ac_Name',
                                  2021: 'Bar_Sale_2021'},
                          inplace=True, errors='raise')
```

```
DataFrameBarRank
```

| | Rank | Bar_Ac_Name | Bar_Sale_2021 |
|----|------|-------------|---------------|
| 0 | 1 | Bar 3 | 9768 |
| 1 | 2 | Bar 8 | 9759 |
| 2 | 3 | Bar 4 | 9428 |
| 3 | 4 | Bar 14 | 9271 |
| 4 | 5 | Bar 1 | 9093 |
| 5 | 6 | Bar 6 | 8758 |
| 6 | 7 | Bar 13 | 8592 |
| 7 | 8 | Bar 2 | 6909 |
| 8 | 9 | Bar 10 | 6002 |
| 9 | 10 | Bar 5 | 5873 |
| 10 | 11 | Bar 12 | 5382 |
| 11 | 12 | Bar 9 | 2373 |
| 12 | 13 | Bar 11 | 2359 |
| 13 | 14 | Bar 15 | 369 |
| 14 | 15 | Bar 7 | 211 |

```
dfBarsTable_setindex_Transpose = dfBarsTable_setindex.T
```

```
dfBarsTable_setindex_Transpose
```

| Account Name | Bar 1 | Bar 2 | Bar 3 | Bar 4 | Bar |
|--------------|-------|-------|-------|-------|-----|
| 5 \ | | | | | |
| 2017 | 1982 | 2786 | 1209 | 906 | |
| 1421 | | | | | |

| | | | | |
|---------------------------------------|-------|-------|-------|-------|
| 2018 | 5388 | 3804 | 1534 | 1251 |
| 1893 | | | | |
| 2019 | 7063 | 4121 | 1634 | 2897 |
| 2722 | | | | |
| 2020 | 7208 | 6210 | 4302 | 4499 |
| 4410 | | | | |
| 2021 | 9093 | 6909 | 9768 | 9428 |
| 5873 | | | | |
| Total_Sales Quantity/Bar/Account Name | 30734 | 23830 | 18447 | 18981 |
| 16319 | | | | |

| Account Name | Bar 6 | Bar 7 | Bar 8 | Bar 9 | Bar |
|---------------------------------------|-------|-------|-------|-------|-----|
| 10 \ | | | | | |
| 2017 | 2341 | 9252 | 1581 | 9766 | |
| 1530 | | | | | |
| 2018 | 6105 | 8499 | 4799 | 8049 | |
| 1620 | | | | | |
| 2019 | 7777 | 991 | 6582 | 5556 | |
| 2027 | | | | | |
| 2020 | 7891 | 448 | 9024 | 5202 | |
| 4881 | | | | | |
| 2021 | 8758 | 211 | 9759 | 2373 | |
| 6002 | | | | | |
| Total_Sales Quantity/Bar/Account Name | 32872 | 19401 | 31745 | 30946 | |
| 16060 | | | | | |

| Account Name | Bar 11 | Bar 12 | Bar 13 | Bar 14 |
|---------------------------------------|--------|--------|--------|--------|
| Bar 15 | | | | |
| 2017 | 7555 | 1532 | 24 | 861 |
| 9058 | | | | |
| 2018 | 6551 | 2678 | 1797 | 1314 |
| 4839 | | | | |
| 2019 | 5188 | 4068 | 3548 | 1810 |
| 4776 | | | | |
| 2020 | 3436 | 4278 | 3668 | 6510 |
| 4024 | | | | |
| 2021 | 2359 | 5382 | 8592 | 9271 |
| 369 | | | | |
| Total_Sales Quantity/Bar/Account Name | 25089 | 17938 | 17629 | 19766 |
| 23066 | | | | |

dfBarsTable_setindex_Transpose.iloc[:-1 , :]

| Account Name | Bar 1 | Bar 2 | Bar 3 | Bar 4 | Bar 5 | Bar 6 | Bar 7 | Bar 8 |
|--------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Bar 9 \ | | | | | | | | |
| 2017 | 1982 | 2786 | 1209 | 906 | 1421 | 2341 | 9252 | 1581 |
| 9766 | | | | | | | | |
| 2018 | 5388 | 3804 | 1534 | 1251 | 1893 | 6105 | 8499 | 4799 |
| 8049 | | | | | | | | |
| 2019 | 7063 | 4121 | 1634 | 2897 | 2722 | 7777 | 991 | 6582 |

| | | | | | | | | |
|------|------|------|------|------|------|------|-----|------|
| 5556 | | | | | | | | |
| 2020 | 7208 | 6210 | 4302 | 4499 | 4410 | 7891 | 448 | 9024 |
| 5202 | | | | | | | | |
| 2021 | 9093 | 6909 | 9768 | 9428 | 5873 | 8758 | 211 | 9759 |
| 2373 | | | | | | | | |

| Account Name | Bar 10 | Bar 11 | Bar 12 | Bar 13 | Bar 14 | Bar 15 |
|--------------|--------|--------|--------|--------|--------|--------|
| 2017 | 1530 | 7555 | 1532 | 24 | 861 | 9058 |
| 2018 | 1620 | 6551 | 2678 | 1797 | 1314 | 4839 |
| 2019 | 2027 | 5188 | 4068 | 3548 | 1810 | 4776 |
| 2020 | 4881 | 3436 | 4278 | 3668 | 6510 | 4024 |
| 2021 | 6002 | 2359 | 5382 | 8592 | 9271 | 369 |

```
#dfBarsTable_setindex_Transpose.iloc[:-1 , :].insert(0, 'Years',
['2017','2018','2019','2020','2021'])
```

```
#dfBarsTable_setindex_Transpose.iloc[:-1 , :]
```

```
X = dfBarsTable_setindex_Transpose.iloc[:-1 , :]
```

```
X['Years'] = ['2017','2018','2019','2020','2021']
```

```
<ipython-input-388-8080938bb2ec>:1: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead
```

See the caveats in the documentation:

https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy

```
X['Years'] = ['2017','2018','2019','2020','2021']
```

```
X.set_index('Years').astype(str)
```

| Account Name | Bar 1 | Bar 2 | Bar 3 | Bar 4 | Bar 5 | Bar 6 | Bar 7 | Bar 8 | Bar 9 | Bar 10 \ Years |
|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------|
|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------|

| | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|
| 2017 | 1982 | 2786 | 1209 | 906 | 1421 | 2341 | 9252 | 1581 | 9766 |
| 1530 | | | | | | | | | |
| 2018 | 5388 | 3804 | 1534 | 1251 | 1893 | 6105 | 8499 | 4799 | 8049 |
| 1620 | | | | | | | | | |
| 2019 | 7063 | 4121 | 1634 | 2897 | 2722 | 7777 | 991 | 6582 | 5556 |
| 2027 | | | | | | | | | |
| 2020 | 7208 | 6210 | 4302 | 4499 | 4410 | 7891 | 448 | 9024 | 5202 |
| 4881 | | | | | | | | | |
| 2021 | 9093 | 6909 | 9768 | 9428 | 5873 | 8758 | 211 | 9759 | 2373 |
| 6002 | | | | | | | | | |

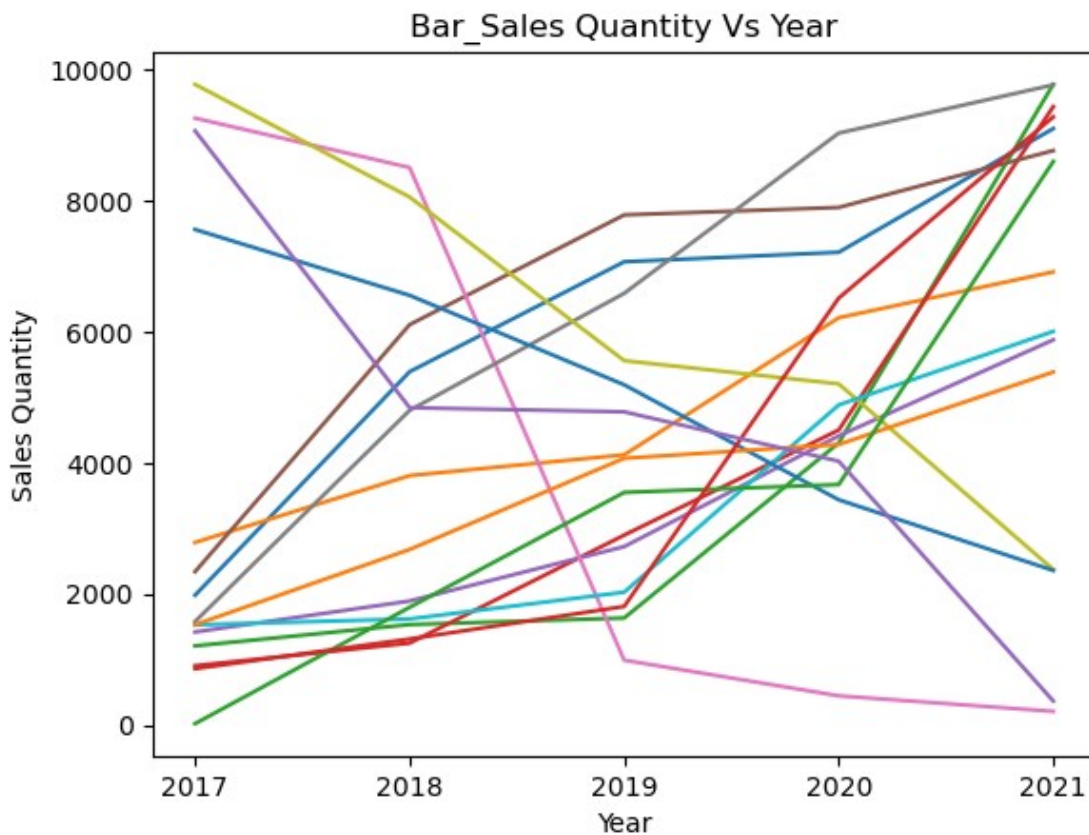
| Account Name | Bar 11 | Bar 12 | Bar 13 | Bar 14 | Bar 15 |
|--------------|--------|--------|--------|--------|--------|
|--------------|--------|--------|--------|--------|--------|

| Years | | | | | |
|-------|------|------|------|------|------|
| 2017 | 7555 | 1532 | 24 | 861 | 9058 |
| 2018 | 6551 | 2678 | 1797 | 1314 | 4839 |
| 2019 | 5188 | 4068 | 3548 | 1810 | 4776 |
| 2020 | 3436 | 4278 | 3668 | 6510 | 4024 |
| 2021 | 2359 | 5382 | 8592 | 9271 | 369 |

```

#plt.plot(dfBarsTable_setindex_Transpose.set_index('Years').astype(str)
).iloc[:-1 , :])
plt.plot(X.set_index('Years')[0:15])
#plt.plot(dfBarsTable.set_index('Years')[0:15])
plt.title('Bar_Sales Quantity Vs Year')
plt.xlabel('Year')
plt.ylabel('Sales Quantity')
plt.show()

```



```
dfRestaurants = df[df['Account Name'].str.contains("Restaurant")]
```

```
dfRestaurants
```

| | Account Name | Account Address \ |
|----|--------------|--|
| 15 | Restaurant 1 | 9848 Linden St, New York NY 10011 |
| 16 | Restaurant 2 | 805 South Pilgrim Court, Brooklyn NY 11225 |

| | | | |
|----|---------------|--|-------|
| 17 | Restaurant 3 | 9132 Redwood Rd, Bronx NY | 10466 |
| 18 | Restaurant 4 | 3 Warren Drive, New York NY | 10040 |
| 19 | Restaurant 5 | 402 Bridgeton Lane, Bronx NY | 10468 |
| 20 | Restaurant 6 | 6 E. Nichols Ave, New York NY | 10027 |
| 21 | Restaurant 7 | 323 North Edgewood St, Bronx NY | 10457 |
| 22 | Restaurant 8 | 484 Thorne St, New York NY | 10128 |
| 23 | Restaurant 9 | 861 Gonzales Lane, Bronx NY | 10472 |
| 24 | Restaurant 10 | 267 Randall Mill Dr, New York NY | 10033 |
| 25 | Restaurant 11 | 12 Lees Creek St, Brooklyn NY | 11211 |
| 26 | Restaurant 12 | 240 W. Manhattan St, Bronx NY | 10462 |
| 27 | Restaurant 13 | 62 Lower River Road, Staten Island, NY | 10306 |
| 28 | Restaurant 14 | 48 S. Brandywine St, New York NY | 10002 |
| 29 | Restaurant 15 | 5 Tallwood St, Brooklyn NY | 11233 |

| | Decision Maker | Phone Number | Account Type | Regular | Sugar | Free |
|----|-------------------|----------------|--------------|---------|-------|------|
| 15 | Dan Hill | (248) 450-0797 | Restaurant | Yes | | Yes |
| 16 | Javier George | (964) 214-3742 | Restaurant | Yes | | Yes |
| 17 | Christopher Evans | (831) 406-6300 | Restaurant | Yes | | Yes |
| 18 | Julie Ross | (778) 387-0744 | Restaurant | Yes | | Yes |
| 19 | Bill Callahan | (617) 419-7996 | Restaurant | Yes | | Yes |
| 20 | Anthony Brooks | (349) 801-7566 | Restaurant | Yes | | Yes |
| 21 | Charlotte Leroux | (784) 634-6873 | Restaurant | Yes | | Yes |
| 22 | Nina Coulter | (938) 752-9381 | Restaurant | Yes | | No |
| 23 | Mia Ang | (253) 861-1301 | Restaurant | Yes | | Yes |
| 24 | Kathy Rogers | (939) 738-6471 | Restaurant | Yes | | Yes |
| 25 | Rita Varga | (754) 696-3109 | Restaurant | Yes | | No |
| 26 | Mel Berkowitz | (967) 547-1542 | Restaurant | Yes | | Yes |
| 27 | Debra Martin | (743) 960-6716 | Restaurant | Yes | | Yes |
| 28 | Deshaun Fletcher | (845) 304-6511 | Restaurant | Yes | | Yes |
| 29 | Kari Lenz | (886) 554-5339 | Restaurant | Yes | | Yes |

Yellow Edition Cooler? Digital screen? Menu inclusion? Posters?

| | | | | | |
|--------|----|-----|-----|-----|----|
| 2017 \ | | | | | |
| 15 | No | No | No | No | No |
| 3501 | | | | | |
| 16 | No | No | No | No | No |
| 3916 | | | | | |
| 17 | No | Yes | No | Yes | No |
| 700 | | | | | |
| 18 | No | No | No | No | No |
| 9773 | | | | | |
| 19 | No | Yes | No | Yes | No |
| 73 | | | | | |
| 20 | No | Yes | No | Yes | No |
| 238 | | | | | |
| 21 | No | Yes | No | Yes | No |
| 1368 | | | | | |
| 22 | No | No | Yes | No | No |
| 8331 | | | | | |
| 23 | No | Yes | Yes | Yes | No |
| 1779 | | | | | |
| 24 | No | Yes | Yes | Yes | No |
| 570 | | | | | |
| 25 | No | No | Yes | No | No |
| 6156 | | | | | |
| 26 | No | Yes | Yes | Yes | No |
| 209 | | | | | |
| 27 | No | No | No | No | No |
| 6309 | | | | | |
| 28 | No | Yes | No | Yes | No |
| 712 | | | | | |
| 29 | No | No | No | No | No |
| 2390 | | | | | |

| | | | | |
|----|------|------|------|------|
| | 2018 | 2019 | 2020 | 2021 |
| 15 | 7079 | 7438 | 7443 | 9225 |
| 16 | 4218 | 5072 | 5201 | 7588 |
| 17 | 5721 | 6247 | 8495 | 9236 |
| 18 | 9179 | 8390 | 8256 | 3815 |
| 19 | 3485 | 4592 | 5143 | 8100 |
| 20 | 1235 | 1822 | 7074 | 8207 |
| 21 | 3447 | 4535 | 5476 | 9983 |
| 22 | 7667 | 5952 | 1998 | 375 |
| 23 | 2124 | 2844 | 6877 | 9570 |
| 24 | 1322 | 7279 | 8443 | 9571 |
| 25 | 6110 | 5791 | 1759 | 969 |
| 26 | 621 | 3098 | 7118 | 8433 |
| 27 | 6227 | 5123 | 4968 | 3857 |
| 28 | 4182 | 6087 | 7494 | 8599 |
| 29 | 2415 | 3461 | 3850 | 4657 |

```
dfRestaurantsTable = dfRestaurants[['Account Name',  
2017,2018,2019,2020,2021]]
```

```
dfRestaurantsTable
```

| | Account Name | 2017 | 2018 | 2019 | 2020 | 2021 |
|----|---------------|------|------|------|------|------|
| 15 | Restaurant 1 | 3501 | 7079 | 7438 | 7443 | 9225 |
| 16 | Restaurant 2 | 3916 | 4218 | 5072 | 5201 | 7588 |
| 17 | Restaurant 3 | 700 | 5721 | 6247 | 8495 | 9236 |
| 18 | Restaurant 4 | 9773 | 9179 | 8390 | 8256 | 3815 |
| 19 | Restaurant 5 | 73 | 3485 | 4592 | 5143 | 8100 |
| 20 | Restaurant 6 | 238 | 1235 | 1822 | 7074 | 8207 |
| 21 | Restaurant 7 | 1368 | 3447 | 4535 | 5476 | 9983 |
| 22 | Restaurant 8 | 8331 | 7667 | 5952 | 1998 | 375 |
| 23 | Restaurant 9 | 1779 | 2124 | 2844 | 6877 | 9570 |
| 24 | Restaurant 10 | 570 | 1322 | 7279 | 8443 | 9571 |
| 25 | Restaurant 11 | 6156 | 6110 | 5791 | 1759 | 969 |
| 26 | Restaurant 12 | 209 | 621 | 3098 | 7118 | 8433 |
| 27 | Restaurant 13 | 6309 | 6227 | 5123 | 4968 | 3857 |
| 28 | Restaurant 14 | 712 | 4182 | 6087 | 7494 | 8599 |
| 29 | Restaurant 15 | 2390 | 2415 | 3461 | 3850 | 4657 |

```
#dfRestaurantsTable_setindex_Transpose
```

```
dfRestaurantsTable_setindex = dfRestaurantsTable.set_index('Account  
Name')
```

```
dfRestaurantsTable_setindex
```

| | 2017 | 2018 | 2019 | 2020 | 2021 |
|---------------|------|------|------|------|------|
| Account Name | | | | | |
| Restaurant 1 | 3501 | 7079 | 7438 | 7443 | 9225 |
| Restaurant 2 | 3916 | 4218 | 5072 | 5201 | 7588 |
| Restaurant 3 | 700 | 5721 | 6247 | 8495 | 9236 |
| Restaurant 4 | 9773 | 9179 | 8390 | 8256 | 3815 |
| Restaurant 5 | 73 | 3485 | 4592 | 5143 | 8100 |
| Restaurant 6 | 238 | 1235 | 1822 | 7074 | 8207 |
| Restaurant 7 | 1368 | 3447 | 4535 | 5476 | 9983 |
| Restaurant 8 | 8331 | 7667 | 5952 | 1998 | 375 |
| Restaurant 9 | 1779 | 2124 | 2844 | 6877 | 9570 |
| Restaurant 10 | 570 | 1322 | 7279 | 8443 | 9571 |
| Restaurant 11 | 6156 | 6110 | 5791 | 1759 | 969 |
| Restaurant 12 | 209 | 621 | 3098 | 7118 | 8433 |
| Restaurant 13 | 6309 | 6227 | 5123 | 4968 | 3857 |
| Restaurant 14 | 712 | 4182 | 6087 | 7494 | 8599 |
| Restaurant 15 | 2390 | 2415 | 3461 | 3850 | 4657 |

```
B = dfRestaurantsTable_setindex
```

```
B['Total_Sales Quantity/Restaurant/Account Name'] = B.sum(axis=1)
```

B

| | 2017 | 2018 | 2019 | 2020 | 2021 | \ |
|---------------|------|------|------|------|------|---|
| Account Name | | | | | | |
| Restaurant 1 | 3501 | 7079 | 7438 | 7443 | 9225 | |
| Restaurant 2 | 3916 | 4218 | 5072 | 5201 | 7588 | |
| Restaurant 3 | 700 | 5721 | 6247 | 8495 | 9236 | |
| Restaurant 4 | 9773 | 9179 | 8390 | 8256 | 3815 | |
| Restaurant 5 | 73 | 3485 | 4592 | 5143 | 8100 | |
| Restaurant 6 | 238 | 1235 | 1822 | 7074 | 8207 | |
| Restaurant 7 | 1368 | 3447 | 4535 | 5476 | 9983 | |
| Restaurant 8 | 8331 | 7667 | 5952 | 1998 | 375 | |
| Restaurant 9 | 1779 | 2124 | 2844 | 6877 | 9570 | |
| Restaurant 10 | 570 | 1322 | 7279 | 8443 | 9571 | |
| Restaurant 11 | 6156 | 6110 | 5791 | 1759 | 969 | |
| Restaurant 12 | 209 | 621 | 3098 | 7118 | 8433 | |
| Restaurant 13 | 6309 | 6227 | 5123 | 4968 | 3857 | |
| Restaurant 14 | 712 | 4182 | 6087 | 7494 | 8599 | |
| Restaurant 15 | 2390 | 2415 | 3461 | 3850 | 4657 | |

| | Total_Sales | Quantity/Restaurant/Account Name |
|---------------|-------------|----------------------------------|
| Account Name | | |
| Restaurant 1 | | 34686 |
| Restaurant 2 | | 25995 |
| Restaurant 3 | | 30399 |
| Restaurant 4 | | 39413 |
| Restaurant 5 | | 21393 |
| Restaurant 6 | | 18576 |
| Restaurant 7 | | 24809 |
| Restaurant 8 | | 24323 |
| Restaurant 9 | | 23194 |
| Restaurant 10 | | 27185 |
| Restaurant 11 | | 20785 |
| Restaurant 12 | | 19479 |
| Restaurant 13 | | 26484 |
| Restaurant 14 | | 27074 |
| Restaurant 15 | | 16773 |

B.sort_values(by='Total_Sales Quantity/Restaurant/Account Name', ascending=False)

| | 2017 | 2018 | 2019 | 2020 | 2021 | \ |
|---------------|------|------|------|------|------|---|
| Account Name | | | | | | |
| Restaurant 4 | 9773 | 9179 | 8390 | 8256 | 3815 | |
| Restaurant 1 | 3501 | 7079 | 7438 | 7443 | 9225 | |
| Restaurant 3 | 700 | 5721 | 6247 | 8495 | 9236 | |
| Restaurant 10 | 570 | 1322 | 7279 | 8443 | 9571 | |
| Restaurant 14 | 712 | 4182 | 6087 | 7494 | 8599 | |
| Restaurant 13 | 6309 | 6227 | 5123 | 4968 | 3857 | |

| | | | | | | |
|------------|----|------|------|------|------|------|
| Restaurant | 2 | 3916 | 4218 | 5072 | 5201 | 7588 |
| Restaurant | 7 | 1368 | 3447 | 4535 | 5476 | 9983 |
| Restaurant | 8 | 8331 | 7667 | 5952 | 1998 | 375 |
| Restaurant | 9 | 1779 | 2124 | 2844 | 6877 | 9570 |
| Restaurant | 5 | 73 | 3485 | 4592 | 5143 | 8100 |
| Restaurant | 11 | 6156 | 6110 | 5791 | 1759 | 969 |
| Restaurant | 12 | 209 | 621 | 3098 | 7118 | 8433 |
| Restaurant | 6 | 238 | 1235 | 1822 | 7074 | 8207 |
| Restaurant | 15 | 2390 | 2415 | 3461 | 3850 | 4657 |

| Account Name | Total_Sales | Quantity/Restaurant/Account Name |
|---------------|-------------|----------------------------------|
| Restaurant 4 | | 39413 |
| Restaurant 1 | | 34686 |
| Restaurant 3 | | 30399 |
| Restaurant 10 | | 27185 |
| Restaurant 14 | | 27074 |
| Restaurant 13 | | 26484 |
| Restaurant 2 | | 25995 |
| Restaurant 7 | | 24809 |
| Restaurant 8 | | 24323 |
| Restaurant 9 | | 23194 |
| Restaurant 5 | | 21393 |
| Restaurant 11 | | 20785 |
| Restaurant 12 | | 19479 |
| Restaurant 6 | | 18576 |
| Restaurant 15 | | 16773 |

```
dfRestaurantsTable_setindex_Transpose = dfRestaurantsTable_setindex.T
```

```
#dfRestaurantsTable_setindex_Transpose['Years'] =  
dfRestaurantsTable_setindex_Transpose.index.astype(str, copy = False)
```

```
#df['salary'] = [200000, 70000, 110000, 670000]  
#dfRestaurantsTable_setindex_Transpose['Years']
```

```
q = dfRestaurantsTable_setindex_Transpose.iloc[:-1 , :]
```

```
q['Years'] = ['2017', '2018', '2019', '2020', '2021']
```

```
<ipython-input-64-c965f25ee90d>:1: SettingWithCopyWarning:  
A value is trying to be set on a copy of a slice from a DataFrame.  
Try using .loc[row_indexer,col_indexer] = value instead
```

See the caveats in the documentation:

https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy

```
q['Years'] = ['2017', '2018', '2019', '2020', '2021']
```

```
q.set_index('Years').astype(str)
```

Account Name Restaurant 1 Restaurant 2 Restaurant 3 Restaurant 4
 Restaurant 5 \
 Years

| | | | | |
|------|------|------|------|------|
| 2017 | 3501 | 3916 | 700 | 9773 |
| 73 | | | | |
| 2018 | 7079 | 4218 | 5721 | 9179 |
| 3485 | | | | |
| 2019 | 7438 | 5072 | 6247 | 8390 |
| 4592 | | | | |
| 2020 | 7443 | 5201 | 8495 | 8256 |
| 5143 | | | | |
| 2021 | 9225 | 7588 | 9236 | 3815 |
| 8100 | | | | |

Account Name Restaurant 6 Restaurant 7 Restaurant 8 Restaurant 9 \
 Years

| | | | | |
|------|------|------|------|------|
| 2017 | 238 | 1368 | 8331 | 1779 |
| 2018 | 1235 | 3447 | 7667 | 2124 |
| 2019 | 1822 | 4535 | 5952 | 2844 |
| 2020 | 7074 | 5476 | 1998 | 6877 |
| 2021 | 8207 | 9983 | 375 | 9570 |

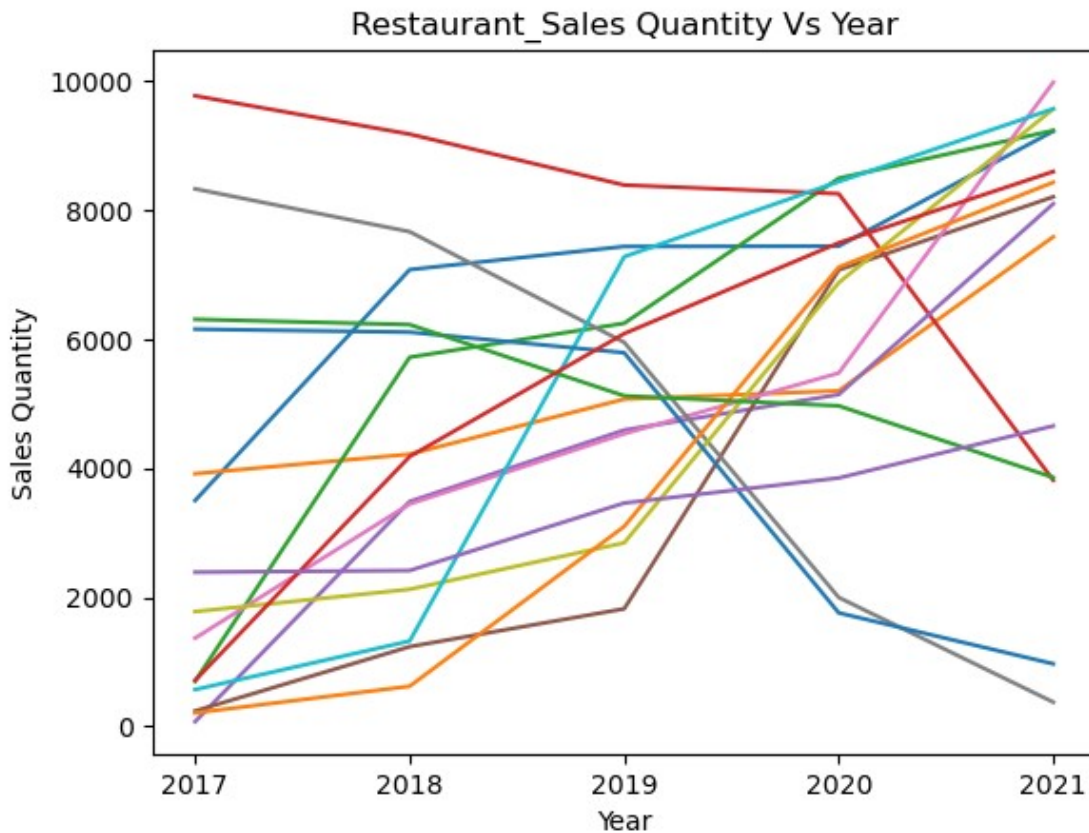
Account Name Restaurant 10 Restaurant 11 Restaurant 12 Restaurant
 13 \
 Years

| | | | | |
|------|------|------|------|------|
| 2017 | 570 | 6156 | 209 | 6309 |
| 2018 | 1322 | 6110 | 621 | 6227 |
| 2019 | 7279 | 5791 | 3098 | 5123 |
| 2020 | 8443 | 1759 | 7118 | 4968 |
| 2021 | 9571 | 969 | 8433 | 3857 |

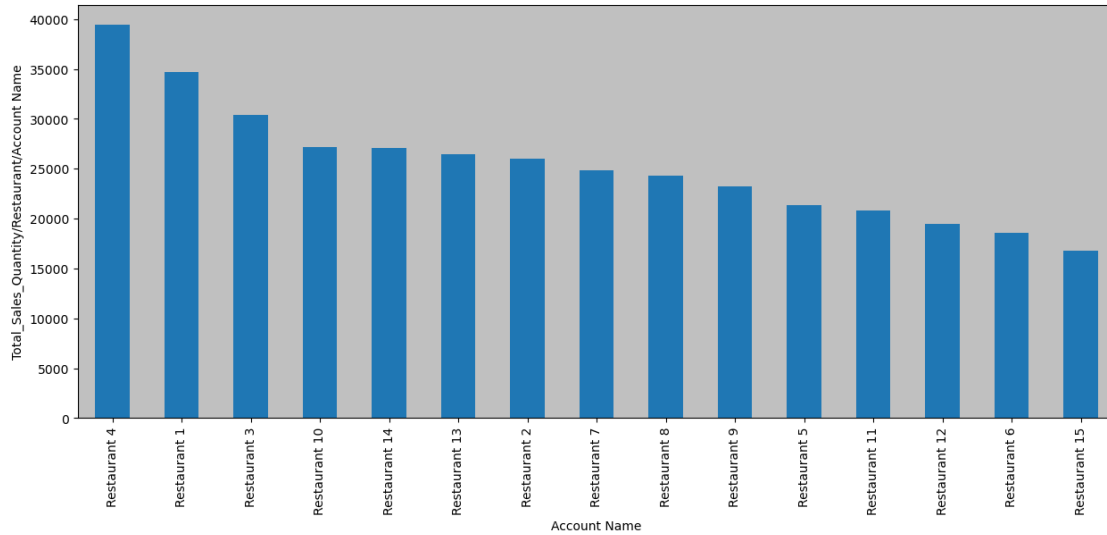
Account Name Restaurant 14 Restaurant 15
 Years

| | | |
|------|------|------|
| 2017 | 712 | 2390 |
| 2018 | 4182 | 2415 |
| 2019 | 6087 | 3461 |
| 2020 | 7494 | 3850 |
| 2021 | 8599 | 4657 |

```
plt.plot(q.set_index('Years')[0:15])
plt.title('Restaurant_Sales Quantity Vs Year')
plt.xlabel('Year')
plt.ylabel('Sales Quantity')
plt.show()
```



```
ax = B.sort_values(by='Total_Sales Quantity/Restaurant/Account Name',
ascending=False)['Total_Sales Quantity/Restaurant/Account
Name'].plot.bar(figsize=(15,6))
ax.set_facecolor("silver")
plt.ylabel('Total_Sales_Quantity/Restaurant/Account Name')
plt.show()
```

```
B[2021].sort_values(ascending=False)
```

```
Account Name
Restaurant 7    9983
Restaurant 10   9571
Restaurant 9    9570
Restaurant 3    9236
Restaurant 1    9225
Restaurant 14   8599
Restaurant 12   8433
Restaurant 6    8207
Restaurant 5    8100
Restaurant 2    7588
Restaurant 15   4657
Restaurant 13   3857
Restaurant 4    3815
Restaurant 11    969
Restaurant 8     375
Name: 2021, dtype: int64
```

```
DataFrameRestaurant =
pd.DataFrame(B[2021].sort_values(ascending=False)).reset_index()
DataFrameRestaurant
```

```
Account Name 2021
0 Restaurant 7 9983
1 Restaurant 10 9571
2 Restaurant 9 9570
3 Restaurant 3 9236
4 Restaurant 1 9225
5 Restaurant 14 8599
6 Restaurant 12 8433
7 Restaurant 6 8207
8 Restaurant 5 8100
```

```

9    Restaurant 2    7588
10   Restaurant 15   4657
11   Restaurant 13   3857
12   Restaurant 4    3815
13   Restaurant 11    969
14   Restaurant 8     375

```

```

DataFrameRestaurant.rename(columns={'Account Name':
'Restaurant_Ac_Name',
                                2021: 'Restaurant_Sale_2021'},
                           inplace=True, errors='raise')

```

```
DataFrameRestaurant
```

```

   Restaurant_Ac_Name  Restaurant_Sale_2021
0      Restaurant 7      9983
1      Restaurant 10     9571
2      Restaurant 9      9570
3      Restaurant 3      9236
4      Restaurant 1      9225
5      Restaurant 14     8599
6      Restaurant 12     8433
7      Restaurant 6      8207
8      Restaurant 5      8100
9      Restaurant 2      7588
10     Restaurant 15     4657
11     Restaurant 13     3857
12     Restaurant 4      3815
13     Restaurant 11      969
14     Restaurant 8       375

```

```
dfNightclubs = df[df['Account Name'].str.contains("Nightclub")]
```

```
dfNightclubs
```

| | Account Name | Account Address | Decision |
|----|--------------|---------------------------------------|----------|
| 30 | Nightclub 1 | 77 Stillwater St, Brooklyn NY 11213 | John |
| 31 | Nightclub 2 | 7061 Bishop St, Yonkers NY 10701 | Raymond |
| 32 | Nightclub 3 | 7223 Cedarwood Ave, Brooklyn NY 11221 | Janie |
| 33 | Nightclub 4 | 62 Lafayette Ave, Bronx NY 10462 | Brooke |
| 34 | Nightclub 5 | 7839 Elm St, Staten Island NY 10306 | Lee |
| 35 | Nightclub 6 | 429 Stonybrook Dr, Brooklyn NY 11203 | Stephen |
| 36 | Nightclub 7 | 640 Beechwood Dr, Bronx NY 10461 | Juan |

| | | | |
|----|--------------|---------------------------------------|--------------------|
| 37 | Nightclub 8 | 9453 N. Wagon Lane, Brooklyn NY 11237 | Kurt Issacs |
| 38 | Nightclub 9 | 81 San Carlos Road, Bronx NY 10463 | Dominique Johnson |
| 39 | Nightclub 10 | 596 Coffee St, Bronx NY 10472 | Larry Alaimo |
| 40 | Nightclub 11 | 92 Princess St, New York NY 10033 | Carlos Moya |
| 41 | Nightclub 12 | 9151 River St, Brooklyn NY 11230 | Shaun Salvatore |
| 42 | Nightclub 13 | 424 Hall Ave, New York NY 10128 | Annie Fuentes |
| 43 | Nightclub 14 | 81 Crescent St, Brooklyn NY 11210 | Maria Sawyer |
| 44 | Nightclub 15 | 7217 Birch Hill Dr, New York NY 10009 | Darnell Straughter |

| | Phone Number | Account Type | Regular | Sugar Free | Yellow Edition |
|-----|----------------|--------------|---------|------------|----------------|
| 30 | (831) 581-1892 | Club | Yes | Yes | Yes |
| No | | | | | |
| 31 | (571) 843-1746 | Club | Yes | Yes | Yes |
| Yes | | | | | |
| 32 | (924) 516-6566 | Club | Yes | Yes | Yes |
| No | | | | | |
| 33 | (247) 999-3394 | Club | Yes | Yes | Yes |
| No | | | | | |
| 34 | (920) 451-3973 | Club | Yes | Yes | Yes |
| Yes | | | | | |
| 35 | (258) 948-7479 | Club | Yes | Yes | Yes |
| No | | | | | |
| 36 | (357) 532-0838 | Club | Yes | Yes | Yes |
| Yes | | | | | |
| 37 | (454) 903-5770 | Club | Yes | No | No |
| No | | | | | |
| 38 | (336) 448-7026 | Club | Yes | Yes | Yes |
| Yes | | | | | |
| 39 | (242) 869-1226 | Club | Yes | Yes | Yes |
| Yes | | | | | |
| 40 | (485) 453-8693 | Club | Yes | No | No |
| No | | | | | |
| 41 | (691) 657-1498 | Club | Yes | Yes | Yes |
| Yes | | | | | |
| 42 | (462) 693-6254 | Club | Yes | Yes | No |
| No | | | | | |
| 43 | (881) 243-5276 | Club | Yes | Yes | Yes |
| Yes | | | | | |
| 44 | (680) 628-4625 | Club | Yes | Yes | Yes |
| Yes | | | | | |

| | Digital screen? | Menu inclusion? | Posters? | 2017 | 2018 | 2019 | 2020 |
|------|-----------------|-----------------|----------|------|------|------|------|
| 2021 | | | | | | | |
| 30 | No | Yes | No | 2519 | 3938 | 5190 | 8203 |
| 8780 | | | | | | | |
| 31 | Yes | Yes | No | 138 | 286 | 6750 | 8254 |
| 8656 | | | | | | | |
| 32 | No | Yes | Yes | 8873 | 8484 | 7883 | 7499 |
| 6592 | | | | | | | |
| 33 | No | Yes | Yes | 3297 | 4866 | 4928 | 8451 |
| 9585 | | | | | | | |
| 34 | Yes | Yes | Yes | 1092 | 3140 | 4123 | 4366 |
| 9482 | | | | | | | |
| 35 | No | Yes | Yes | 2541 | 3794 | 3984 | 8803 |
| 9338 | | | | | | | |
| 36 | Yes | Yes | Yes | 742 | 3751 | 4423 | 8733 |
| 9909 | | | | | | | |
| 37 | No | Yes | Yes | 7703 | 6957 | 3898 | 1857 |
| 1512 | | | | | | | |
| 38 | Yes | Yes | Yes | 488 | 5535 | 5775 | 7661 |
| 9206 | | | | | | | |
| 39 | Yes | Yes | Yes | 376 | 889 | 4373 | 6803 |
| 7578 | | | | | | | |
| 40 | No | Yes | Yes | 7840 | 5804 | 4259 | 4243 |
| 907 | | | | | | | |
| 41 | Yes | Yes | Yes | 1038 | 3615 | 3712 | 5819 |
| 9589 | | | | | | | |
| 42 | No | No | No | 8891 | 5952 | 5914 | 5405 |
| 4031 | | | | | | | |
| 43 | No | No | No | 1290 | 4033 | 6956 | 7929 |
| 8834 | | | | | | | |
| 44 | Yes | No | No | 431 | 6231 | 7478 | 8039 |
| 8271 | | | | | | | |

```
dfNightclubsTable = dfNightclubs[['Account Name',
2017,2018,2019,2020,2021]]
```

```
dfNightclubsTable
```

| | Account Name | 2017 | 2018 | 2019 | 2020 | 2021 |
|----|--------------|------|------|------|------|------|
| 30 | Nightclub 1 | 2519 | 3938 | 5190 | 8203 | 8780 |
| 31 | Nightclub 2 | 138 | 286 | 6750 | 8254 | 8656 |
| 32 | Nightclub 3 | 8873 | 8484 | 7883 | 7499 | 6592 |
| 33 | Nightclub 4 | 3297 | 4866 | 4928 | 8451 | 9585 |
| 34 | Nightclub 5 | 1092 | 3140 | 4123 | 4366 | 9482 |
| 35 | Nightclub 6 | 2541 | 3794 | 3984 | 8803 | 9338 |
| 36 | Nightclub 7 | 742 | 3751 | 4423 | 8733 | 9909 |
| 37 | Nightclub 8 | 7703 | 6957 | 3898 | 1857 | 1512 |
| 38 | Nightclub 9 | 488 | 5535 | 5775 | 7661 | 9206 |
| 39 | Nightclub 10 | 376 | 889 | 4373 | 6803 | 7578 |

| | | | | | | | |
|----|-----------|----|------|------|------|------|------|
| 40 | Nightclub | 11 | 7840 | 5804 | 4259 | 4243 | 907 |
| 41 | Nightclub | 12 | 1038 | 3615 | 3712 | 5819 | 9589 |
| 42 | Nightclub | 13 | 8891 | 5952 | 5914 | 5405 | 4031 |
| 43 | Nightclub | 14 | 1290 | 4033 | 6956 | 7929 | 8834 |
| 44 | Nightclub | 15 | 431 | 6231 | 7478 | 8039 | 8271 |

```
dfNightclubsTable_setindex = dfNightclubsTable.set_index('Account
Name')
```

```
dfNightclubsTable_setindex
```

| | 2017 | 2018 | 2019 | 2020 | 2021 |
|--------------|------|------|------|------|------|
| Account Name | | | | | |
| Nightclub 1 | 2519 | 3938 | 5190 | 8203 | 8780 |
| Nightclub 2 | 138 | 286 | 6750 | 8254 | 8656 |
| Nightclub 3 | 8873 | 8484 | 7883 | 7499 | 6592 |
| Nightclub 4 | 3297 | 4866 | 4928 | 8451 | 9585 |
| Nightclub 5 | 1092 | 3140 | 4123 | 4366 | 9482 |
| Nightclub 6 | 2541 | 3794 | 3984 | 8803 | 9338 |
| Nightclub 7 | 742 | 3751 | 4423 | 8733 | 9909 |
| Nightclub 8 | 7703 | 6957 | 3898 | 1857 | 1512 |
| Nightclub 9 | 488 | 5535 | 5775 | 7661 | 9206 |
| Nightclub 10 | 376 | 889 | 4373 | 6803 | 7578 |
| Nightclub 11 | 7840 | 5804 | 4259 | 4243 | 907 |
| Nightclub 12 | 1038 | 3615 | 3712 | 5819 | 9589 |
| Nightclub 13 | 8891 | 5952 | 5914 | 5405 | 4031 |
| Nightclub 14 | 1290 | 4033 | 6956 | 7929 | 8834 |
| Nightclub 15 | 431 | 6231 | 7478 | 8039 | 8271 |

```
C = dfNightclubsTable_setindex
```

```
C['Total_Sales Quantity/Nightclub/Account Name'] = C.sum(axis=1)
```

```
C
```

| | 2017 | 2018 | 2019 | 2020 | 2021 | \ |
|--------------|------|------|------|------|------|---|
| Account Name | | | | | | |
| Nightclub 1 | 2519 | 3938 | 5190 | 8203 | 8780 | |
| Nightclub 2 | 138 | 286 | 6750 | 8254 | 8656 | |
| Nightclub 3 | 8873 | 8484 | 7883 | 7499 | 6592 | |
| Nightclub 4 | 3297 | 4866 | 4928 | 8451 | 9585 | |
| Nightclub 5 | 1092 | 3140 | 4123 | 4366 | 9482 | |
| Nightclub 6 | 2541 | 3794 | 3984 | 8803 | 9338 | |
| Nightclub 7 | 742 | 3751 | 4423 | 8733 | 9909 | |
| Nightclub 8 | 7703 | 6957 | 3898 | 1857 | 1512 | |
| Nightclub 9 | 488 | 5535 | 5775 | 7661 | 9206 | |
| Nightclub 10 | 376 | 889 | 4373 | 6803 | 7578 | |
| Nightclub 11 | 7840 | 5804 | 4259 | 4243 | 907 | |
| Nightclub 12 | 1038 | 3615 | 3712 | 5819 | 9589 | |
| Nightclub 13 | 8891 | 5952 | 5914 | 5405 | 4031 | |

| | | | | | |
|--------------|------|------|------|------|------|
| Nightclub 14 | 1290 | 4033 | 6956 | 7929 | 8834 |
| Nightclub 15 | 431 | 6231 | 7478 | 8039 | 8271 |

| Account Name | Total_Sales | Quantity/Nightclub/Account Name |
|--------------|-------------|---------------------------------|
| Nightclub 1 | | 28630 |
| Nightclub 2 | | 24084 |
| Nightclub 3 | | 39331 |
| Nightclub 4 | | 31127 |
| Nightclub 5 | | 22203 |
| Nightclub 6 | | 28460 |
| Nightclub 7 | | 27558 |
| Nightclub 8 | | 21927 |
| Nightclub 9 | | 28665 |
| Nightclub 10 | | 20019 |
| Nightclub 11 | | 23053 |
| Nightclub 12 | | 23773 |
| Nightclub 13 | | 30193 |
| Nightclub 14 | | 29042 |
| Nightclub 15 | | 30450 |

C.sort_values(by='Total_Sales Quantity/Nightclub/Account Name', ascending=False)

| Account Name | 2017 | 2018 | 2019 | 2020 | 2021 | \ |
|--------------|------|------|------|------|------|---|
| Nightclub 3 | 8873 | 8484 | 7883 | 7499 | 6592 | |
| Nightclub 4 | 3297 | 4866 | 4928 | 8451 | 9585 | |
| Nightclub 15 | 431 | 6231 | 7478 | 8039 | 8271 | |
| Nightclub 13 | 8891 | 5952 | 5914 | 5405 | 4031 | |
| Nightclub 14 | 1290 | 4033 | 6956 | 7929 | 8834 | |
| Nightclub 9 | 488 | 5535 | 5775 | 7661 | 9206 | |
| Nightclub 1 | 2519 | 3938 | 5190 | 8203 | 8780 | |
| Nightclub 6 | 2541 | 3794 | 3984 | 8803 | 9338 | |
| Nightclub 7 | 742 | 3751 | 4423 | 8733 | 9909 | |
| Nightclub 2 | 138 | 286 | 6750 | 8254 | 8656 | |
| Nightclub 12 | 1038 | 3615 | 3712 | 5819 | 9589 | |
| Nightclub 11 | 7840 | 5804 | 4259 | 4243 | 907 | |
| Nightclub 5 | 1092 | 3140 | 4123 | 4366 | 9482 | |
| Nightclub 8 | 7703 | 6957 | 3898 | 1857 | 1512 | |
| Nightclub 10 | 376 | 889 | 4373 | 6803 | 7578 | |

| Account Name | Total_Sales | Quantity/Nightclub/Account Name |
|--------------|-------------|---------------------------------|
| Nightclub 3 | | 39331 |
| Nightclub 4 | | 31127 |
| Nightclub 15 | | 30450 |
| Nightclub 13 | | 30193 |

| | |
|--------------|-------|
| Nightclub 14 | 29042 |
| Nightclub 9 | 28665 |
| Nightclub 1 | 28630 |
| Nightclub 6 | 28460 |
| Nightclub 7 | 27558 |
| Nightclub 2 | 24084 |
| Nightclub 12 | 23773 |
| Nightclub 11 | 23053 |
| Nightclub 5 | 22203 |
| Nightclub 8 | 21927 |
| Nightclub 10 | 20019 |

```
dfNightclubsTable_setindex_Transpose = dfNightclubsTable_setindex.T
```

```
L = dfNightclubsTable_setindex_Transpose.iloc[:-1 , :]
```

```
L
```

| Account Name | Nightclub 1 | Nightclub 2 | Nightclub 3 | Nightclub 4 |
|---------------|-------------|-------------|-------------|-------------|
| Nightclub 5 \ | | | | |
| 2017 | 2519 | 138 | 8873 | 3297 |
| 1092 | | | | |
| 2018 | 3938 | 286 | 8484 | 4866 |
| 3140 | | | | |
| 2019 | 5190 | 6750 | 7883 | 4928 |
| 4123 | | | | |
| 2020 | 8203 | 8254 | 7499 | 8451 |
| 4366 | | | | |
| 2021 | 8780 | 8656 | 6592 | 9585 |
| 9482 | | | | |

| Account Name | Nightclub 6 | Nightclub 7 | Nightclub 8 | Nightclub 9 | \ |
|--------------|-------------|-------------|-------------|-------------|---|
| 2017 | 2541 | 742 | 7703 | 488 | |
| 2018 | 3794 | 3751 | 6957 | 5535 | |
| 2019 | 3984 | 4423 | 3898 | 5775 | |
| 2020 | 8803 | 8733 | 1857 | 7661 | |
| 2021 | 9338 | 9909 | 1512 | 9206 | |

| Account Name | Nightclub 10 | Nightclub 11 | Nightclub 12 | Nightclub |
|--------------|--------------|--------------|--------------|-----------|
| 13 \ | | | | |
| 2017 | 376 | 7840 | 1038 | 8891 |
| 2018 | 889 | 5804 | 3615 | 5952 |
| 2019 | 4373 | 4259 | 3712 | 5914 |
| 2020 | 6803 | 4243 | 5819 | 5405 |
| 2021 | 7578 | 907 | 9589 | 4031 |

| Account Name | Nightclub 14 | Nightclub 15 |
|--------------|--------------|--------------|
| 2017 | 1290 | 431 |
| 2018 | 4033 | 6231 |
| 2019 | 6956 | 7478 |
| 2020 | 7929 | 8039 |
| 2021 | 8834 | 8271 |

```
L['Years'] = ['2017', '2018', '2019', '2020', '2021']
```

```
L
```

```
<ipython-input-85-0375bcb77cbe>:1: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead
```

See the caveats in the documentation:

https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy

```
L['Years'] = ['2017', '2018', '2019', '2020', '2021']
```

| Account Name | Nightclub 1 | Nightclub 2 | Nightclub 3 | Nightclub 4 |
|---------------|-------------|-------------|-------------|-------------|
| Nightclub 5 \ | | | | |
| 2017 | 2519 | 138 | 8873 | 3297 |
| 1092 | | | | |
| 2018 | 3938 | 286 | 8484 | 4866 |
| 3140 | | | | |
| 2019 | 5190 | 6750 | 7883 | 4928 |
| 4123 | | | | |
| 2020 | 8203 | 8254 | 7499 | 8451 |
| 4366 | | | | |
| 2021 | 8780 | 8656 | 6592 | 9585 |
| 9482 | | | | |

| Account Name | Nightclub 6 | Nightclub 7 | Nightclub 8 | Nightclub 9 \ |
|--------------|-------------|-------------|-------------|---------------|
| 2017 | 2541 | 742 | 7703 | 488 |
| 2018 | 3794 | 3751 | 6957 | 5535 |
| 2019 | 3984 | 4423 | 3898 | 5775 |
| 2020 | 8803 | 8733 | 1857 | 7661 |
| 2021 | 9338 | 9909 | 1512 | 9206 |

| Account Name | Nightclub 10 | Nightclub 11 | Nightclub 12 | Nightclub |
|--------------|--------------|--------------|--------------|-----------|
| 13 \ | | | | |
| 2017 | 376 | 7840 | 1038 | 8891 |
| 2018 | 889 | 5804 | 3615 | 5952 |
| 2019 | 4373 | 4259 | 3712 | 5914 |
| 2020 | 6803 | 4243 | 5819 | 5405 |

| | | | | |
|------|------|-----|------|------|
| 2021 | 7578 | 907 | 9589 | 4031 |
|------|------|-----|------|------|

| Account Name | Nightclub 14 | Nightclub 15 | Years |
|--------------|--------------|--------------|-------|
| 2017 | 1290 | 431 | 2017 |
| 2018 | 4033 | 6231 | 2018 |
| 2019 | 6956 | 7478 | 2019 |
| 2020 | 7929 | 8039 | 2020 |
| 2021 | 8834 | 8271 | 2021 |

L.set_index('Years').astype(str)

| Account Name | Nightclub 1 | Nightclub 2 | Nightclub 3 | Nightclub 4 | Nightclub 5 \ Years |
|--------------|-------------|-------------|-------------|-------------|---------------------|
|--------------|-------------|-------------|-------------|-------------|---------------------|

| | | | | |
|------|------|------|------|------|
| 2017 | 2519 | 138 | 8873 | 3297 |
| 1092 | | | | |
| 2018 | 3938 | 286 | 8484 | 4866 |
| 3140 | | | | |
| 2019 | 5190 | 6750 | 7883 | 4928 |
| 4123 | | | | |
| 2020 | 8203 | 8254 | 7499 | 8451 |
| 4366 | | | | |
| 2021 | 8780 | 8656 | 6592 | 9585 |
| 9482 | | | | |

| Account Name | Nightclub 6 | Nightclub 7 | Nightclub 8 | Nightclub 9 | Nightclub 10 \ Years |
|--------------|-------------|-------------|-------------|-------------|----------------------|
|--------------|-------------|-------------|-------------|-------------|----------------------|

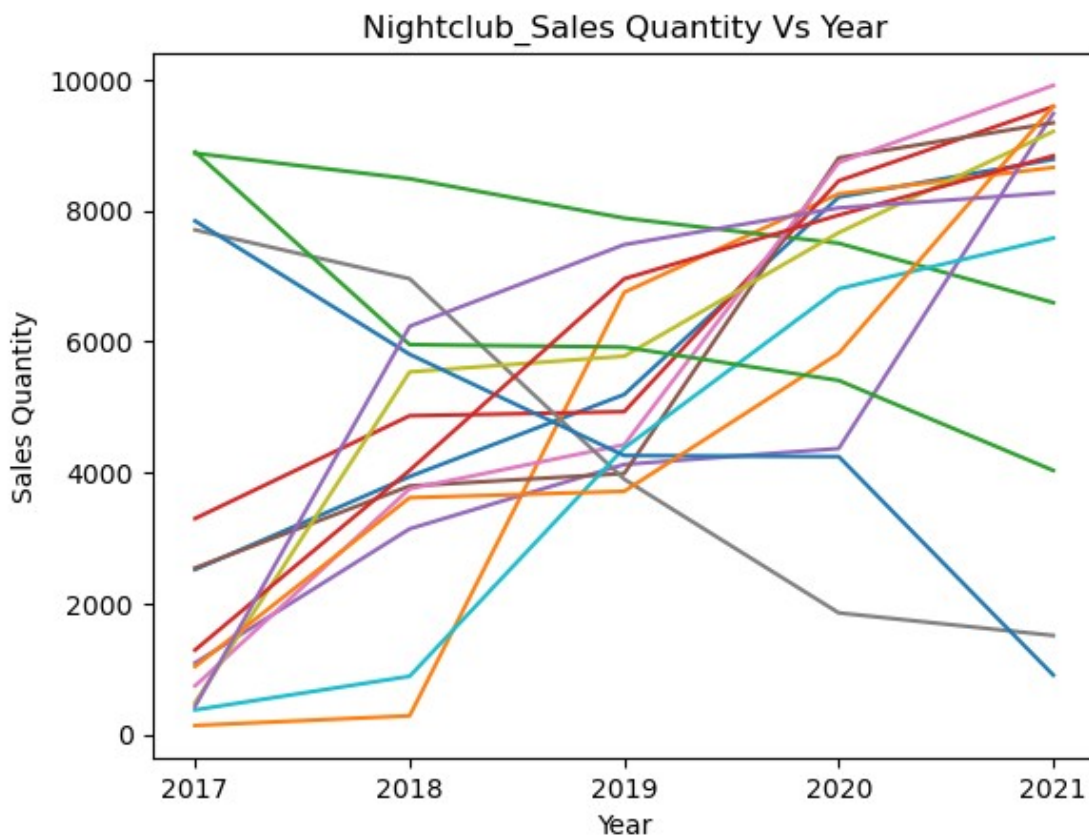
| | | | | |
|------|------|------|------|------|
| 2017 | 2541 | 742 | 7703 | 488 |
| 376 | | | | |
| 2018 | 3794 | 3751 | 6957 | 5535 |
| 889 | | | | |
| 2019 | 3984 | 4423 | 3898 | 5775 |
| 4373 | | | | |
| 2020 | 8803 | 8733 | 1857 | 7661 |
| 6803 | | | | |
| 2021 | 9338 | 9909 | 1512 | 9206 |
| 7578 | | | | |

| Account Name | Nightclub 11 | Nightclub 12 | Nightclub 13 | Nightclub 14 | Nightclub 15 | Years |
|--------------|--------------|--------------|--------------|--------------|--------------|-------|
|--------------|--------------|--------------|--------------|--------------|--------------|-------|

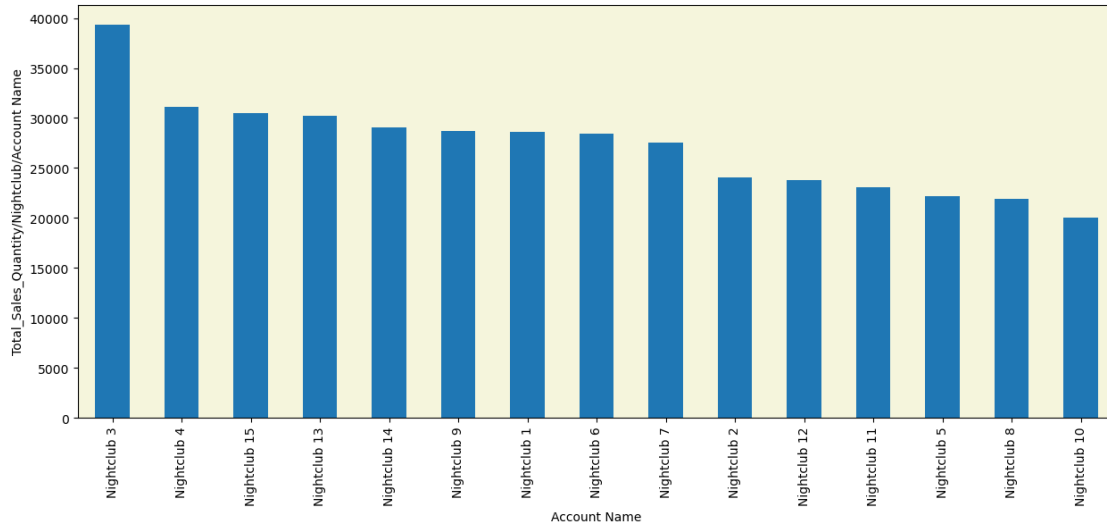
| | | | | |
|------|------|------|------|------|
| 2017 | 7840 | 1038 | 8891 | 1290 |
| 431 | | | | |
| 2018 | 5804 | 3615 | 5952 | 4033 |
| 6231 | | | | |

| | | | | |
|------|------|------|------|------|
| 2019 | 4259 | 3712 | 5914 | 6956 |
| 7478 | | | | |
| 2020 | 4243 | 5819 | 5405 | 7929 |
| 8039 | | | | |
| 2021 | 907 | 9589 | 4031 | 8834 |
| 8271 | | | | |

```
plt.plot(L.set_index('Years')[0:15])
plt.title('Nightclub_Sales Quantity Vs Year')
plt.xlabel('Year')
plt.ylabel('Sales Quantity')
plt.show()
```



```
ax = C.sort_values(by='Total_Sales Quantity/Nightclub/Account Name',
ascending=False)['Total_Sales Quantity/Nightclub/Account
Name'].plot.bar(figsize=(15,6))
ax.set_facecolor("beige")
plt.ylabel('Total_Sales_Quantity/Nightclub/Account Name')
plt.show()
```



```
C[2021].sort_values(ascending=False)
```

```
Account Name
Nightclub 7      9909
Nightclub 12     9589
Nightclub 4      9585
Nightclub 5      9482
Nightclub 6      9338
Nightclub 9      9206
Nightclub 14     8834
Nightclub 1      8780
Nightclub 2      8656
Nightclub 15     8271
Nightclub 10     7578
Nightclub 3      6592
Nightclub 13     4031
Nightclub 8      1512
Nightclub 11       907
Name: 2021, dtype: int64
```

```
DataFrameNightclub =
pd.DataFrame(C[2021].sort_values(ascending=False)).reset_index()
DataFrameNightclub
```

```
Account Name 2021
0 Nightclub 7 9909
1 Nightclub 12 9589
2 Nightclub 4 9585
3 Nightclub 5 9482
4 Nightclub 6 9338
5 Nightclub 9 9206
```

| | | |
|----|--------------|------|
| 6 | Nightclub 14 | 8834 |
| 7 | Nightclub 1 | 8780 |
| 8 | Nightclub 2 | 8656 |
| 9 | Nightclub 15 | 8271 |
| 10 | Nightclub 10 | 7578 |
| 11 | Nightclub 3 | 6592 |
| 12 | Nightclub 13 | 4031 |
| 13 | Nightclub 8 | 1512 |
| 14 | Nightclub 11 | 907 |

```
DataFrameNightclub.rename(columns={'Account Name':
'Nightclub_Ac_Name',
                                2021: 'Nightclub_Sale_2021'},
inplace=True, errors='raise')
DataFrameNightclub
```

| | Nightclub_Ac_Name | Nightclub_Sale_2021 |
|----|-------------------|---------------------|
| 0 | Nightclub 7 | 9909 |
| 1 | Nightclub 12 | 9589 |
| 2 | Nightclub 4 | 9585 |
| 3 | Nightclub 5 | 9482 |
| 4 | Nightclub 6 | 9338 |
| 5 | Nightclub 9 | 9206 |
| 6 | Nightclub 14 | 8834 |
| 7 | Nightclub 1 | 8780 |
| 8 | Nightclub 2 | 8656 |
| 9 | Nightclub 15 | 8271 |
| 10 | Nightclub 10 | 7578 |
| 11 | Nightclub 3 | 6592 |
| 12 | Nightclub 13 | 4031 |
| 13 | Nightclub 8 | 1512 |
| 14 | Nightclub 11 | 907 |

```
dfEventVenues = df[df['Account Name'].str.contains("Event Venue")]
```

```
dfEventVenues
```

| | Account Name | Account Address \ |
|----|----------------|---------------------------------------|
| 45 | Event Venue 1 | 7184 Center Court, Brooklyn NY 11208 |
| 46 | Event Venue 2 | 815 2nd St, New York NY 10028 |
| 47 | Event Venue 3 | 9875 Franklin Rd, Brooklyn NY 11223 |
| 48 | Event Venue 4 | 601 Bank Ave, Brooklyn NY 11218 |
| 49 | Event Venue 5 | 21 Yukon St, Bronx NY 10451 |
| 50 | Event Venue 6 | 18 N. Woodland Ave, New York NY 10025 |
| 51 | Event Venue 7 | 65 Lower River Ave, Bronx NY 10465 |
| 52 | Event Venue 8 | 8680 Alderwood St, New York NY 10032 |
| 53 | Event Venue 9 | 8388 Gonzales St, Brooklyn NY 11228 |
| 54 | Event Venue 10 | 9760 Taylor Dr, Brooklyn NY 11211 |
| 55 | Event Venue 11 | 419 E. Henry Ave, New York NY 10031 |

| | | |
|----|----------------|--|
| 56 | Event Venue 12 | 8083 8th St, Brooklyn NY 11209 |
| 57 | Event Venue 13 | 2 Rock Maple Ave, New York NY 10029 |
| 58 | Event Venue 14 | 9577 Nicolls Ave, Staten Island NY 10312 |
| 59 | Event Venue 15 | 174 Del Monte St, Brooklyn NY 11224 |

| | Decision Maker | Phone Number | Account Type | Regular | Sugar |
|------|------------------|----------------|--------------|---------|-------|
| Free | \ | | | | |
| 45 | Richard Breaux | (685) 981-8556 | Hotel | Yes | No |
| 46 | Craig Collins | (828) 840-2736 | Hotel | Yes | Yes |
| 47 | Donna Lam | (931) 618-9558 | Hotel | Yes | Yes |
| 48 | Teresa Vasbinder | (261) 690-0303 | Hotel | Yes | No |
| 49 | Andre Mobley | (597) 701-9429 | Hotel | Yes | Yes |
| 50 | Ray Hernandez | (609) 345-8163 | Hotel | Yes | Yes |
| 51 | Thomas Stewart | (381) 643-1230 | Hotel | Yes | Yes |
| 52 | Henry Lange | (293) 473-1512 | Hotel | Yes | Yes |
| 53 | Danielle Tomas | (459) 261-2301 | Hotel | Yes | Yes |
| 54 | Joe Schimke | (936) 816-9148 | Hotel | Yes | No |
| 55 | Carlos Jackson | (201) 363-0653 | Hotel | Yes | Yes |
| 56 | Russell Wallace | (237) 890-0247 | Hotel | Yes | No |
| 57 | Shameka West | (488) 656-0761 | Hotel | Yes | Yes |
| 58 | Kevin Fleming | (650) 848-8284 | Hotel | Yes | Yes |
| 59 | Anna Grey | (980) 437-1451 | Hotel | Yes | Yes |

| | Yellow Edition | Cooler? | Digital screen? | Menu inclusion? | Posters? |
|------|----------------|---------|-----------------|-----------------|----------|
| 2017 | \ | | | | |
| 45 | No | No | No | Yes | No |
| 8156 | | | | | |
| 46 | Yes | Yes | No | Yes | No |
| 299 | | | | | |
| 47 | Yes | No | No | Yes | No |
| 1323 | | | | | |
| 48 | No | No | No | Yes | No |
| 8466 | | | | | |

| | | | | | |
|------|-----|-----|----|-----|----|
| 49 | Yes | No | No | Yes | No |
| 870 | | | | | |
| 50 | Yes | No | No | Yes | No |
| 1497 | | | | | |
| 51 | Yes | No | No | Yes | No |
| 1082 | | | | | |
| 52 | No | No | No | Yes | No |
| 9791 | | | | | |
| 53 | Yes | No | No | Yes | No |
| 1357 | | | | | |
| 54 | No | No | No | Yes | No |
| 576 | | | | | |
| 55 | Yes | Yes | No | No | No |
| 128 | | | | | |
| 56 | No | No | No | No | No |
| 8034 | | | | | |
| 57 | Yes | No | No | No | No |
| 1263 | | | | | |
| 58 | Yes | No | No | No | No |
| 1032 | | | | | |
| 59 | Yes | No | No | No | No |
| 1014 | | | | | |

| | | | | |
|----|------|------|------|------|
| | 2018 | 2019 | 2020 | 2021 |
| 45 | 1245 | 791 | 338 | 44 |
| 46 | 657 | 6238 | 8922 | 9081 |
| 47 | 4963 | 6292 | 6728 | 8202 |
| 48 | 4079 | 2797 | 2245 | 1696 |
| 49 | 2428 | 7386 | 8835 | 9766 |
| 50 | 1768 | 2804 | 5718 | 9822 |
| 51 | 3353 | 6351 | 8550 | 9272 |
| 52 | 9610 | 7534 | 5080 | 4936 |
| 53 | 4189 | 5407 | 6233 | 9681 |
| 54 | 2628 | 3612 | 5066 | 5156 |
| 55 | 416 | 747 | 1028 | 6357 |
| 56 | 6541 | 3311 | 3254 | 2687 |
| 57 | 2517 | 8042 | 8222 | 9686 |
| 58 | 3919 | 4466 | 5568 | 6476 |
| 59 | 2254 | 4534 | 6796 | 7730 |

```
dfEventVenuesTable = dfEventVenues[['Account Name',
2017,2018,2019,2020,2021]]
```

```
dfEventVenuesTable
```

| | | | | | | |
|----|---------------|------|------|------|------|------|
| | Account Name | 2017 | 2018 | 2019 | 2020 | 2021 |
| 45 | Event Venue 1 | 8156 | 1245 | 791 | 338 | 44 |
| 46 | Event Venue 2 | 299 | 657 | 6238 | 8922 | 9081 |
| 47 | Event Venue 3 | 1323 | 4963 | 6292 | 6728 | 8202 |
| 48 | Event Venue 4 | 8466 | 4079 | 2797 | 2245 | 1696 |
| 49 | Event Venue 5 | 870 | 2428 | 7386 | 8835 | 9766 |

| | | | | | | |
|----|----------------|------|------|------|------|------|
| 50 | Event Venue 6 | 1497 | 1768 | 2804 | 5718 | 9822 |
| 51 | Event Venue 7 | 1082 | 3353 | 6351 | 8550 | 9272 |
| 52 | Event Venue 8 | 9791 | 9610 | 7534 | 5080 | 4936 |
| 53 | Event Venue 9 | 1357 | 4189 | 5407 | 6233 | 9681 |
| 54 | Event Venue 10 | 576 | 2628 | 3612 | 5066 | 5156 |
| 55 | Event Venue 11 | 128 | 416 | 747 | 1028 | 6357 |
| 56 | Event Venue 12 | 8034 | 6541 | 3311 | 3254 | 2687 |
| 57 | Event Venue 13 | 1263 | 2517 | 8042 | 8222 | 9686 |
| 58 | Event Venue 14 | 1032 | 3919 | 4466 | 5568 | 6476 |
| 59 | Event Venue 15 | 1014 | 2254 | 4534 | 6796 | 7730 |

```
dfEventVenuesTable_setindex = dfEventVenuesTable.set_index('Account Name')
```

```
dfEventVenuesTable_setindex
```

| | 2017 | 2018 | 2019 | 2020 | 2021 |
|----------------|------|------|------|------|------|
| Account Name | | | | | |
| Event Venue 1 | 8156 | 1245 | 791 | 338 | 44 |
| Event Venue 2 | 299 | 657 | 6238 | 8922 | 9081 |
| Event Venue 3 | 1323 | 4963 | 6292 | 6728 | 8202 |
| Event Venue 4 | 8466 | 4079 | 2797 | 2245 | 1696 |
| Event Venue 5 | 870 | 2428 | 7386 | 8835 | 9766 |
| Event Venue 6 | 1497 | 1768 | 2804 | 5718 | 9822 |
| Event Venue 7 | 1082 | 3353 | 6351 | 8550 | 9272 |
| Event Venue 8 | 9791 | 9610 | 7534 | 5080 | 4936 |
| Event Venue 9 | 1357 | 4189 | 5407 | 6233 | 9681 |
| Event Venue 10 | 576 | 2628 | 3612 | 5066 | 5156 |
| Event Venue 11 | 128 | 416 | 747 | 1028 | 6357 |
| Event Venue 12 | 8034 | 6541 | 3311 | 3254 | 2687 |
| Event Venue 13 | 1263 | 2517 | 8042 | 8222 | 9686 |
| Event Venue 14 | 1032 | 3919 | 4466 | 5568 | 6476 |
| Event Venue 15 | 1014 | 2254 | 4534 | 6796 | 7730 |

```
D = dfEventVenuesTable_setindex
```

```
D['Total_Sales Quantity/Event Venue/Account Name'] = D.sum(axis=1)
```

```
D
```

| | 2017 | 2018 | 2019 | 2020 | 2021 | \ |
|----------------|------|------|------|------|------|---|
| Account Name | | | | | | |
| Event Venue 1 | 8156 | 1245 | 791 | 338 | 44 | |
| Event Venue 2 | 299 | 657 | 6238 | 8922 | 9081 | |
| Event Venue 3 | 1323 | 4963 | 6292 | 6728 | 8202 | |
| Event Venue 4 | 8466 | 4079 | 2797 | 2245 | 1696 | |
| Event Venue 5 | 870 | 2428 | 7386 | 8835 | 9766 | |
| Event Venue 6 | 1497 | 1768 | 2804 | 5718 | 9822 | |
| Event Venue 7 | 1082 | 3353 | 6351 | 8550 | 9272 | |
| Event Venue 8 | 9791 | 9610 | 7534 | 5080 | 4936 | |
| Event Venue 9 | 1357 | 4189 | 5407 | 6233 | 9681 | |
| Event Venue 10 | 576 | 2628 | 3612 | 5066 | 5156 | |

| | | | | | |
|----------------|------|------|------|------|------|
| Event Venue 11 | 128 | 416 | 747 | 1028 | 6357 |
| Event Venue 12 | 8034 | 6541 | 3311 | 3254 | 2687 |
| Event Venue 13 | 1263 | 2517 | 8042 | 8222 | 9686 |
| Event Venue 14 | 1032 | 3919 | 4466 | 5568 | 6476 |
| Event Venue 15 | 1014 | 2254 | 4534 | 6796 | 7730 |

| Total_Sales Quantity/Event Venue/Account Name | |
|---|-------|
| Account Name | |
| Event Venue 1 | 10574 |
| Event Venue 2 | 25197 |
| Event Venue 3 | 27508 |
| Event Venue 4 | 19283 |
| Event Venue 5 | 29285 |
| Event Venue 6 | 21609 |
| Event Venue 7 | 28608 |
| Event Venue 8 | 36951 |
| Event Venue 9 | 26867 |
| Event Venue 10 | 17038 |
| Event Venue 11 | 8676 |
| Event Venue 12 | 23827 |
| Event Venue 13 | 29730 |
| Event Venue 14 | 21461 |
| Event Venue 15 | 22328 |

D.sort_values(by='Total_Sales Quantity/Event Venue/Account Name', ascending=False)

| | 2017 | 2018 | 2019 | 2020 | 2021 | \ |
|----------------|------|------|------|------|------|---|
| Account Name | | | | | | |
| Event Venue 8 | 9791 | 9610 | 7534 | 5080 | 4936 | |
| Event Venue 13 | 1263 | 2517 | 8042 | 8222 | 9686 | |
| Event Venue 5 | 870 | 2428 | 7386 | 8835 | 9766 | |
| Event Venue 7 | 1082 | 3353 | 6351 | 8550 | 9272 | |
| Event Venue 3 | 1323 | 4963 | 6292 | 6728 | 8202 | |
| Event Venue 9 | 1357 | 4189 | 5407 | 6233 | 9681 | |
| Event Venue 2 | 299 | 657 | 6238 | 8922 | 9081 | |
| Event Venue 12 | 8034 | 6541 | 3311 | 3254 | 2687 | |
| Event Venue 15 | 1014 | 2254 | 4534 | 6796 | 7730 | |
| Event Venue 6 | 1497 | 1768 | 2804 | 5718 | 9822 | |
| Event Venue 14 | 1032 | 3919 | 4466 | 5568 | 6476 | |
| Event Venue 4 | 8466 | 4079 | 2797 | 2245 | 1696 | |
| Event Venue 10 | 576 | 2628 | 3612 | 5066 | 5156 | |
| Event Venue 1 | 8156 | 1245 | 791 | 338 | 44 | |
| Event Venue 11 | 128 | 416 | 747 | 1028 | 6357 | |

| Total_Sales Quantity/Event Venue/Account Name | |
|---|-------|
| Account Name | |
| Event Venue 8 | 36951 |
| Event Venue 13 | 29730 |
| Event Venue 5 | 29285 |

| | |
|----------------|-------|
| Event Venue 7 | 28608 |
| Event Venue 3 | 27508 |
| Event Venue 9 | 26867 |
| Event Venue 2 | 25197 |
| Event Venue 12 | 23827 |
| Event Venue 15 | 22328 |
| Event Venue 6 | 21609 |
| Event Venue 14 | 21461 |
| Event Venue 4 | 19283 |
| Event Venue 10 | 17038 |
| Event Venue 1 | 10574 |
| Event Venue 11 | 8676 |

```
#dfEventVenuesTable_setindex
```

```
dfEventVenuesTable_setindex_Transpose = dfEventVenuesTable_setindex.T
0 = dfEventVenuesTable_setindex_Transpose.iloc[:-1, :]
0['Years'] = ['2017', '2018', '2019', '2020', '2021']
0.set_index('Years').astype(str)
```

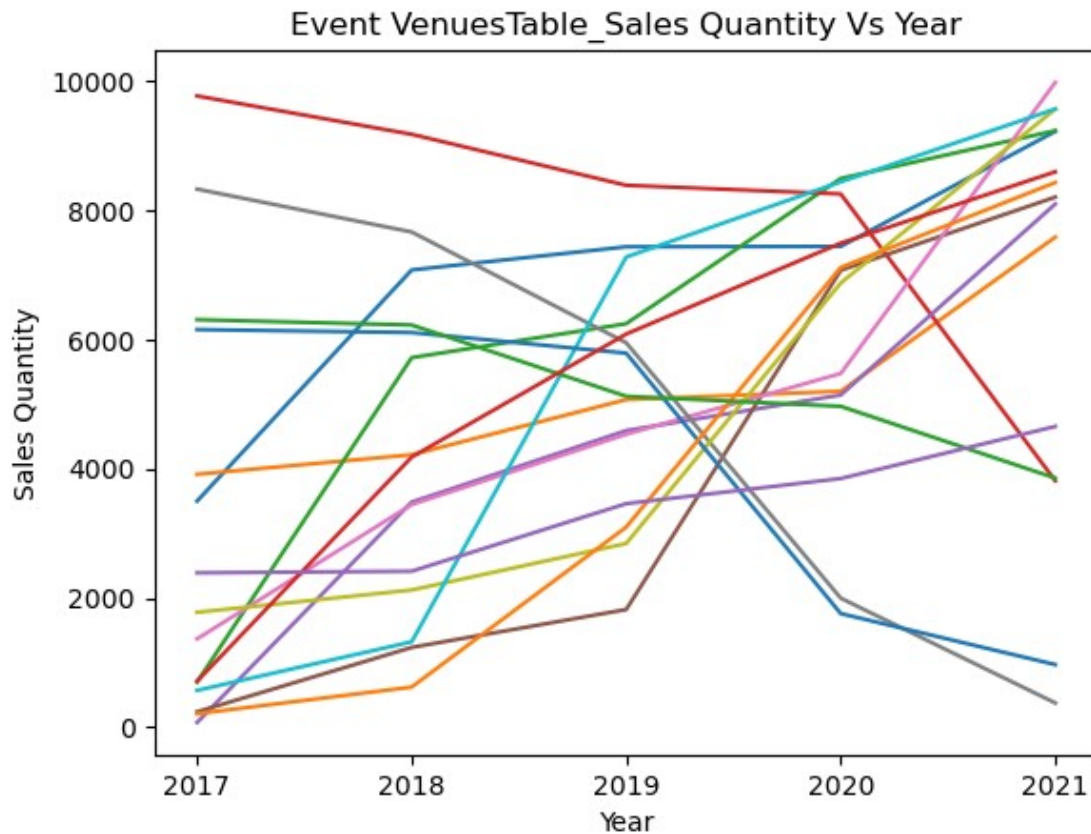
```
plt.plot(q.set_index('Years')[0:15])
plt.title('Event VenuesTable_Sales Quantity Vs Year')
plt.xlabel('Year')
plt.ylabel('Sales Quantity')
plt.show()
```

```
<ipython-input-101-503523c47793>:3: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead
```

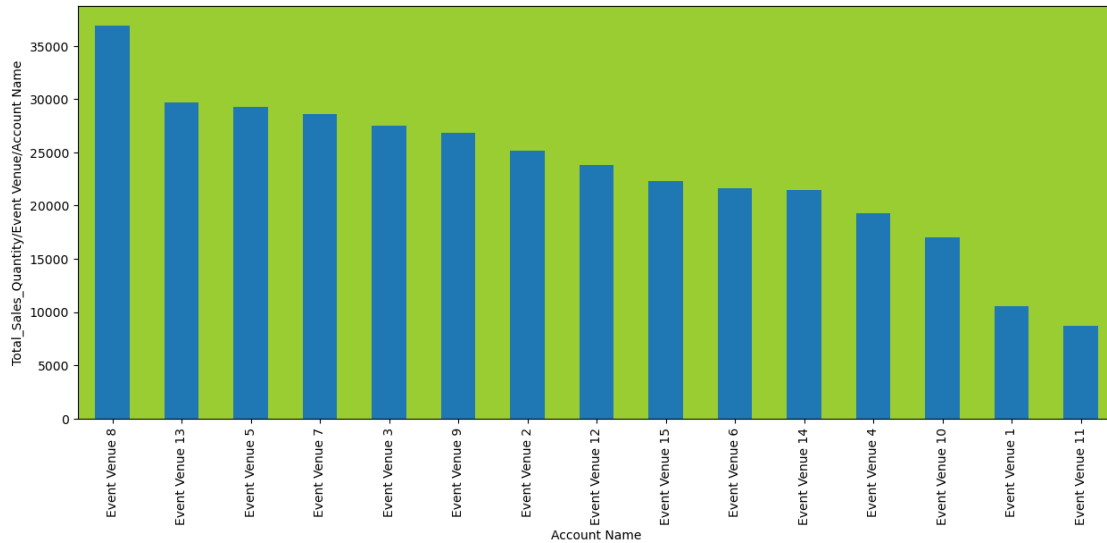
See the caveats in the documentation:

https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy

```
0['Years'] = ['2017', '2018', '2019', '2020', '2021']
```



```
ax = D.sort_values(by='Total_Sales Quantity/Event Venue/Account Name',
ascending=False)['Total_Sales Quantity/Event Venue/Account
Name'].plot.bar(figsize=(15,6))
ax.set_facecolor("yellowgreen")
plt.ylabel('Total_Sales_Quantity/Event Venue/Account Name')
plt.show()
```



```
D[2021].sort_values(ascending=False)
```

```
Account Name
Event Venue 6      9822
Event Venue 5      9766
Event Venue 13     9686
Event Venue 9      9681
Event Venue 7      9272
Event Venue 2      9081
Event Venue 3      8202
Event Venue 15     7730
Event Venue 14     6476
Event Venue 11     6357
Event Venue 10     5156
Event Venue 8      4936
Event Venue 12     2687
Event Venue 4      1696
Event Venue 1         44
Name: 2021, dtype: int64
```

```
DataFrameEventVenue =
pd.DataFrame(D[2021].sort_values(ascending=False)).reset_index()
DataFrameEventVenue
```

```
Account Name 2021
0 Event Venue 6 9822
1 Event Venue 5 9766
2 Event Venue 13 9686
3 Event Venue 9 9681
4 Event Venue 7 9272
5 Event Venue 2 9081
6 Event Venue 3 8202
7 Event Venue 15 7730
8 Event Venue 14 6476
```

```

9   Event Venue 11  6357
10  Event Venue 10  5156
11   Event Venue 8   4936
12  Event Venue 12  2687
13   Event Venue 4   1696
14   Event Venue 1    44

```

```

DataFrameEventVenue.rename(columns={'Account Name':
    'EventVenue_Ac_Name',
                                2021: 'EventVenue_Sale_2021'},
    inplace=True, errors='raise')

```

```
DataFrameEventVenue
```

| | EventVenue_Ac_Name | EventVenue_Sale_2021 |
|----|--------------------|----------------------|
| 0 | Event Venue 6 | 9822 |
| 1 | Event Venue 5 | 9766 |
| 2 | Event Venue 13 | 9686 |
| 3 | Event Venue 9 | 9681 |
| 4 | Event Venue 7 | 9272 |
| 5 | Event Venue 2 | 9081 |
| 6 | Event Venue 3 | 8202 |
| 7 | Event Venue 15 | 7730 |
| 8 | Event Venue 14 | 6476 |
| 9 | Event Venue 11 | 6357 |
| 10 | Event Venue 10 | 5156 |
| 11 | Event Venue 8 | 4936 |
| 12 | Event Venue 12 | 2687 |
| 13 | Event Venue 4 | 1696 |
| 14 | Event Venue 1 | 44 |

```

# Using pandas.concat() to concat two DataFrame
#data =
[DataFrameBarRank,DataFrameRestaurant,DataFrameNightclub,DataFrameEventVenue]
#ConcatRankTables = pd.concat(data)
#ConcatRankTables
# Using pandas.concat() to join concat two DataFrames
data =
pd.concat([DataFrameBarRank,DataFrameRestaurant,DataFrameNightclub,DataFrameEventVenue], axis=1, join='inner')
data

```

| | Rank | Bar_Ac_Name | Bar_Sale_2021 | Restaurant_Ac_Name |
|------------------------|------|-------------|---------------|--------------------|
| Restaurant_Sale_2021 \ | | | | |
| 0 | 1 | Bar 3 | 9768 | Restaurant 7 |
| 9983 | | | | |
| 1 | 2 | Bar 8 | 9759 | Restaurant 10 |
| 9571 | | | | |
| 2 | 3 | Bar 4 | 9428 | Restaurant 9 |
| 9570 | | | | |
| 3 | 4 | Bar 14 | 9271 | Restaurant 3 |

| | | | | |
|------|----|--------|------|---------------|
| 9236 | | | | |
| 4 | 5 | Bar 1 | 9093 | Restaurant 1 |
| 9225 | | | | |
| 5 | 6 | Bar 6 | 8758 | Restaurant 14 |
| 8599 | | | | |
| 6 | 7 | Bar 13 | 8592 | Restaurant 12 |
| 8433 | | | | |
| 7 | 8 | Bar 2 | 6909 | Restaurant 6 |
| 8207 | | | | |
| 8 | 9 | Bar 10 | 6002 | Restaurant 5 |
| 8100 | | | | |
| 9 | 10 | Bar 5 | 5873 | Restaurant 2 |
| 7588 | | | | |
| 10 | 11 | Bar 12 | 5382 | Restaurant 15 |
| 4657 | | | | |
| 11 | 12 | Bar 9 | 2373 | Restaurant 13 |
| 3857 | | | | |
| 12 | 13 | Bar 11 | 2359 | Restaurant 4 |
| 3815 | | | | |
| 13 | 14 | Bar 15 | 369 | Restaurant 11 |
| 969 | | | | |
| 14 | 15 | Bar 7 | 211 | Restaurant 8 |
| 375 | | | | |

| | Nightclub_Ac_Name | Nightclub_Sale_2021 | EventVenue_Ac_Name \ |
|----|-------------------|---------------------|----------------------|
| 0 | Nightclub 7 | 9909 | Event Venue 6 |
| 1 | Nightclub 12 | 9589 | Event Venue 5 |
| 2 | Nightclub 4 | 9585 | Event Venue 13 |
| 3 | Nightclub 5 | 9482 | Event Venue 9 |
| 4 | Nightclub 6 | 9338 | Event Venue 7 |
| 5 | Nightclub 9 | 9206 | Event Venue 2 |
| 6 | Nightclub 14 | 8834 | Event Venue 3 |
| 7 | Nightclub 1 | 8780 | Event Venue 15 |
| 8 | Nightclub 2 | 8656 | Event Venue 14 |
| 9 | Nightclub 15 | 8271 | Event Venue 11 |
| 10 | Nightclub 10 | 7578 | Event Venue 10 |
| 11 | Nightclub 3 | 6592 | Event Venue 8 |
| 12 | Nightclub 13 | 4031 | Event Venue 12 |
| 13 | Nightclub 8 | 1512 | Event Venue 4 |
| 14 | Nightclub 11 | 907 | Event Venue 1 |

| | EventVenue_Sale_2021 |
|---|----------------------|
| 0 | 9822 |
| 1 | 9766 |
| 2 | 9686 |
| 3 | 9681 |
| 4 | 9272 |
| 5 | 9081 |
| 6 | 8202 |
| 7 | 7730 |

| | |
|----|------|
| 8 | 6476 |
| 9 | 6357 |
| 10 | 5156 |
| 11 | 4936 |
| 12 | 2687 |
| 13 | 1696 |
| 14 | 44 |

Best and Worst Performing Accounts by Account Type (5 Year CAGR)

Top 2 Accounts

```
DataTop2Rank = data.head(2)
DataTop2Rank
```

| | Rank | Bar_Ac_Name | Bar_Sale_2021 | Restaurant_Ac_Name |
|---|------|-------------|---------------|--------------------|
| 0 | 1 | Bar 3 | 9768 | Restaurant 7 |
| 1 | 2 | Bar 8 | 9759 | Restaurant 10 |

| | Nightclub_Ac_Name | Nightclub_Sale_2021 | EventVenue_Ac_Name |
|---|-------------------|---------------------|--------------------|
| 0 | Nightclub 7 | 9909 | Event Venue 6 |
| 1 | Nightclub 12 | 9589 | Event Venue 5 |

| | EventVenue_Sale_2021 |
|---|----------------------|
| 0 | 9822 |
| 1 | 9766 |

Bottom 2 Accounts

```
DataBottom2Rank = data.tail(2)
DataBottom2Rank
```

| | Rank | Bar_Ac_Name | Bar_Sale_2021 | Restaurant_Ac_Name |
|----|------|-------------|---------------|--------------------|
| 13 | 14 | Bar 15 | 369 | Restaurant 11 |
| 14 | 15 | Bar 7 | 211 | Restaurant 8 |

| | Nightclub_Ac_Name | Nightclub_Sale_2021 | EventVenue_Ac_Name |
|----|-------------------|---------------------|--------------------|
| 13 | Nightclub 8 | 1512 | Event Venue 4 |
| 14 | Nightclub 11 | 907 | Event Venue 1 |

| | EventVenue_Sale_2021 |
|--|----------------------|
|--|----------------------|

```
13          1696
14          44
```

```
# df1['Stateright'] = df1['State'].str[-2:]
df['Zipcode'] = df['Account Address'].str[-5:]

# Remove both the first few & last few characters from a column of
texts
```

```
df['State'] = df['Account Address'].str[:-5].str[-3:]
```

```
df['Account Address'].str[:-8]
```

```
0          2131 Patterson Road, Brooklyn
1          3685 Morningview Lane, New York
2          2285 Ladybug Drive, New York
3          2930 Southern Street, New York
4          2807 Geraldine Lane, New York
5          7778 Cherry Road, Bronx
6          48 Winchester Avenue, New York
7          8735 Squaw Creek Drive, Brooklyn
8          267 Third Road, New York
9          102 Coffee Court, Bronx
10         44 W. Pheasant Street, Brooklyn
11         7488 N. Marconi Ave, Brooklyn
12         9575 Shipley Court, Brooklyn
13         8156 Lake View Street, New York,
14         44 Madison Dr, New York
15         9848 Linden St, New York
16         805 South Pilgrim Court, Brooklyn
17         9132 Redwood Rd, Bronx
18         3 Warren Drive, New York
19         402 Bridgeton Lane, Bronx
20         6 E. Nichols Ave, New York
21         323 North Edgewood St, Bronx
22         484 Thorne St, New York
23         861 Gonzales Lane, Bronx
24         267 Randall Mill Dr, New York
25         12 Lees Creek St, Brooklyn
26         240 W. Manhattan St, Bronx
27         62 Lower River Road, Staten Island,
28         48 S. Brandywine St, New York
29         5 Tallwood St, Brooklyn
30         77 Stillwater St, Brooklyn
31         7061 Bishop St, Yonkers
32         7223 Cedarwood Ave, Brooklyn
33         62 Lafayette Ave, Bronx
34         7839 Elm St, Staten Island
35         429 Stonybrook Dr, Brooklyn
```

```

36         640 Beechwood Dr, Bronx
37     9453 N. Wagon Lane, Brooklyn
38         81 San Carlos Road, Bronx
39         596 Coffee St, Bronx
40         92 Princess St, New York
41         9151 River St, Brooklyn
42         424 Hall Ave, New York
43         81 Crescent St, Brooklyn
44     7217 Birch Hill Dr, New York
45     7184 Center Court, Brooklyn
46         815 2nd St, New York
47     9875 Franklin Rd, Brooklyn
48         601 Bank Ave, Brooklyn
49         21 Yukon St, Bronx
50     18 N. Woodland Ave, New York
51         65 Lower River Ave, Bronx
52     8680 Alderwood St, New York
53     8388 Gonzales St, Brooklyn
54     9760 Taylor Dr, Brooklyn
55     419 E. Henry Ave, New York
56         8083 8th St, Brooklyn
57         2 Rock Maple Ave, New York
58     9577 Nicolls Ave, Staten Island
59     174 Del Monte St, Brooklyn

```

```
Name: Account Address, dtype: object
```

```
df[['Street','string','City']] = df['Account Address'].str[:8].str.partition(',')
```

```
df1 = df
```

```
df1.drop(['Account Name','Account Address', 'string'], axis = 1, inplace = True)
```

```
df1
```

| | Decision Maker | Phone Number | Account Type | Regular | Sugar Free |
|---|------------------|----------------|--------------|---------|------------|
| 0 | Dorothy Rizzo | (880) 283-6803 | Bar | Yes | Yes |
| 1 | Lawson Moore | (711) 426-7350 | Bar | Yes | Yes |
| 2 | Vin Hudson | (952) 952-5573 | Bar | Yes | Yes |
| 3 | Susana Huels | (491) 505-6064 | Bar | Yes | Yes |
| 4 | Shanna Hettinger | (412) 570-0596 | Bar | Yes | Yes |
| 5 | Roy McGlynn | (594) 807-4187 | Bar | Yes | Yes |

| | | | | | |
|----|-------------------|----------------|------------|-----|-----|
| 6 | Lorena Posacco | (678) 294-8103 | Bar | Yes | No |
| 7 | Juanita Wisozk | (305) 531-1310 | Bar | Yes | Yes |
| 8 | Velma Riley | (697) 543-0310 | Bar | Yes | No |
| 9 | Holly Gaines | (277) 456-4626 | Bar | Yes | Yes |
| 10 | Gary Brown | (459) 968-9453 | Bar | Yes | No |
| 11 | Jeffrey Akins | (313) 417-8968 | Bar | Yes | No |
| 12 | Tim Young | (876) 653-1727 | Bar | Yes | Yes |
| 13 | Debra Kroll | (628) 832-4986 | Bar | Yes | Yes |
| 14 | Kelly Boyd | (220) 929-0797 | Bar | Yes | Yes |
| 15 | Dan Hill | (248) 450-0797 | Restaurant | Yes | Yes |
| 16 | Javier George | (964) 214-3742 | Restaurant | Yes | Yes |
| 17 | Christopher Evans | (831) 406-6300 | Restaurant | Yes | Yes |
| 18 | Julie Ross | (778) 387-0744 | Restaurant | Yes | Yes |
| 19 | Bill Callahan | (617) 419-7996 | Restaurant | Yes | Yes |
| 20 | Anthony Brooks | (349) 801-7566 | Restaurant | Yes | Yes |
| 21 | Charlotte Leroux | (784) 634-6873 | Restaurant | Yes | Yes |
| 22 | Nina Coulter | (938) 752-9381 | Restaurant | Yes | No |
| 23 | Mia Ang | (253) 861-1301 | Restaurant | Yes | Yes |
| 24 | Kathy Rogers | (939) 738-6471 | Restaurant | Yes | Yes |
| 25 | Rita Varga | (754) 696-3109 | Restaurant | Yes | No |
| 26 | Mel Berkowitz | (967) 547-1542 | Restaurant | Yes | Yes |
| 27 | Debra Martin | (743) 960-6716 | Restaurant | Yes | Yes |
| 28 | Deshaun Fletcher | (845) 304-6511 | Restaurant | Yes | Yes |
| 29 | Kari Lenz | (886) 554-5339 | Restaurant | Yes | Yes |

| | | | | | | |
|----|--------------------|-------|----------|-------|-----|-----|
| 30 | John Mackey | (831) | 581-1892 | Club | Yes | Yes |
| 31 | Raymond Heywin | (571) | 843-1746 | Club | Yes | Yes |
| 32 | Janie Roberson | (924) | 516-6566 | Club | Yes | Yes |
| 33 | Brooke Hayes | (247) | 999-3394 | Club | Yes | Yes |
| 34 | Lee Niemeyer | (920) | 451-3973 | Club | Yes | Yes |
| 35 | Stephen Harris | (258) | 948-7479 | Club | Yes | Yes |
| 36 | Juan Scott | (357) | 532-0838 | Club | Yes | Yes |
| 37 | Kurt Issacs | (454) | 903-5770 | Club | Yes | No |
| 38 | Dominique Johnson | (336) | 448-7026 | Club | Yes | Yes |
| 39 | Larry Alaimo | (242) | 869-1226 | Club | Yes | Yes |
| 40 | Carlos Moya | (485) | 453-8693 | Club | Yes | No |
| 41 | Shaun Salvatore | (691) | 657-1498 | Club | Yes | Yes |
| 42 | Annie Fuentes | (462) | 693-6254 | Club | Yes | Yes |
| 43 | Maria Sawyer | (881) | 243-5276 | Club | Yes | Yes |
| 44 | Darnell Straughter | (680) | 628-4625 | Club | Yes | Yes |
| 45 | Richard Breaux | (685) | 981-8556 | Hotel | Yes | No |
| 46 | Craig Collins | (828) | 840-2736 | Hotel | Yes | Yes |
| 47 | Donna Lam | (931) | 618-9558 | Hotel | Yes | Yes |
| 48 | Teresa Vasbinder | (261) | 690-0303 | Hotel | Yes | No |
| 49 | Andre Mobley | (597) | 701-9429 | Hotel | Yes | Yes |
| 50 | Ray Hernandez | (609) | 345-8163 | Hotel | Yes | Yes |
| 51 | Thomas Stewart | (381) | 643-1230 | Hotel | Yes | Yes |
| 52 | Henry Lange | (293) | 473-1512 | Hotel | Yes | Yes |
| 53 | Danielle Tomas | (459) | 261-2301 | Hotel | Yes | Yes |

| | | | | | | |
|----|-----------------|-------|----------|-------|-----|-----|
| 54 | Joe Schimke | (936) | 816-9148 | Hotel | Yes | No |
| 55 | Carlos Jackson | (201) | 363-0653 | Hotel | Yes | Yes |
| 56 | Russell Wallace | (237) | 890-0247 | Hotel | Yes | No |
| 57 | Shameka West | (488) | 656-0761 | Hotel | Yes | Yes |
| 58 | Kevin Fleming | (650) | 848-8284 | Hotel | Yes | Yes |
| 59 | Anna Grey | (980) | 437-1451 | Hotel | Yes | Yes |

Yellow Edition Cooler? Digital screen? Menu inclusion? Posters?

| | | | | | |
|--------|-----|-----|-----|-----|-----|
| 2017 \ | | | | | |
| 0 | Yes | Yes | Yes | Yes | Yes |
| 1982 | | | | | |
| 1 | Yes | No | Yes | Yes | Yes |
| 2786 | | | | | |
| 2 | Yes | Yes | Yes | Yes | Yes |
| 1209 | | | | | |
| 3 | Yes | Yes | Yes | Yes | Yes |
| 906 | | | | | |
| 4 | No | Yes | Yes | Yes | Yes |
| 1421 | | | | | |
| 5 | Yes | No | Yes | Yes | No |
| 2341 | | | | | |
| 6 | No | No | No | Yes | No |
| 9252 | | | | | |
| 7 | Yes | Yes | No | Yes | No |
| 1581 | | | | | |
| 8 | No | No | No | Yes | No |
| 9766 | | | | | |
| 9 | No | Yes | No | Yes | No |
| 1530 | | | | | |
| 10 | No | No | No | No | No |
| 7555 | | | | | |
| 11 | No | No | No | No | No |
| 1532 | | | | | |
| 12 | Yes | Yes | Yes | Yes | Yes |
| 24 | | | | | |
| 13 | Yes | Yes | Yes | Yes | Yes |
| 861 | | | | | |
| 14 | No | No | No | No | No |
| 9058 | | | | | |
| 15 | No | No | No | No | No |
| 3501 | | | | | |
| 16 | No | No | No | No | No |

| | | | | | |
|------|-----|-----|-----|-----|-----|
| 3916 | | | | | |
| 17 | No | Yes | No | Yes | No |
| 700 | | | | | |
| 18 | No | No | No | No | No |
| 9773 | | | | | |
| 19 | No | Yes | No | Yes | No |
| 73 | | | | | |
| 20 | No | Yes | No | Yes | No |
| 238 | | | | | |
| 21 | No | Yes | No | Yes | No |
| 1368 | | | | | |
| 22 | No | No | Yes | No | No |
| 8331 | | | | | |
| 23 | No | Yes | Yes | Yes | No |
| 1779 | | | | | |
| 24 | No | Yes | Yes | Yes | No |
| 570 | | | | | |
| 25 | No | No | Yes | No | No |
| 6156 | | | | | |
| 26 | No | Yes | Yes | Yes | No |
| 209 | | | | | |
| 27 | No | No | No | No | No |
| 6309 | | | | | |
| 28 | No | Yes | No | Yes | No |
| 712 | | | | | |
| 29 | No | No | No | No | No |
| 2390 | | | | | |
| 30 | Yes | No | No | Yes | No |
| 2519 | | | | | |
| 31 | Yes | Yes | Yes | Yes | No |
| 138 | | | | | |
| 32 | Yes | No | No | Yes | Yes |
| 8873 | | | | | |
| 33 | Yes | No | No | Yes | Yes |
| 3297 | | | | | |
| 34 | Yes | Yes | Yes | Yes | Yes |
| 1092 | | | | | |
| 35 | Yes | No | No | Yes | Yes |
| 2541 | | | | | |
| 36 | Yes | Yes | Yes | Yes | Yes |
| 742 | | | | | |
| 37 | No | No | No | Yes | Yes |
| 7703 | | | | | |
| 38 | Yes | Yes | Yes | Yes | Yes |
| 488 | | | | | |
| 39 | Yes | Yes | Yes | Yes | Yes |
| 376 | | | | | |
| 40 | No | No | No | Yes | Yes |
| 7840 | | | | | |
| 41 | Yes | Yes | Yes | Yes | Yes |

| | | | | | |
|------|-----|-----|-----|-----|----|
| 1038 | | | | | |
| 42 | No | No | No | No | No |
| 8891 | | | | | |
| 43 | Yes | Yes | No | No | No |
| 1290 | | | | | |
| 44 | Yes | Yes | Yes | No | No |
| 431 | | | | | |
| 45 | No | No | No | Yes | No |
| 8156 | | | | | |
| 46 | Yes | Yes | No | Yes | No |
| 299 | | | | | |
| 47 | Yes | No | No | Yes | No |
| 1323 | | | | | |
| 48 | No | No | No | Yes | No |
| 8466 | | | | | |
| 49 | Yes | No | No | Yes | No |
| 870 | | | | | |
| 50 | Yes | No | No | Yes | No |
| 1497 | | | | | |
| 51 | Yes | No | No | Yes | No |
| 1082 | | | | | |
| 52 | No | No | No | Yes | No |
| 9791 | | | | | |
| 53 | Yes | No | No | Yes | No |
| 1357 | | | | | |
| 54 | No | No | No | Yes | No |
| 576 | | | | | |
| 55 | Yes | Yes | No | No | No |
| 128 | | | | | |
| 56 | No | No | No | No | No |
| 8034 | | | | | |
| 57 | Yes | No | No | No | No |
| 1263 | | | | | |
| 58 | Yes | No | No | No | No |
| 1032 | | | | | |
| 59 | Yes | No | No | No | No |
| 1014 | | | | | |

| | 2018 | 2019 | 2020 | 2021 | Zipcode | State | Street \ |
|----|------|------|------|------|---------|-------|------------------------|
| 0 | 5388 | 7063 | 7208 | 9093 | 11201 | NY | 2131 Patterson Road |
| 1 | 3804 | 4121 | 6210 | 6909 | 10013 | NY | 3685 Morningview Lane |
| 2 | 1534 | 1634 | 4302 | 9768 | 10013 | NY | 2285 Ladybug Drive |
| 3 | 1251 | 2897 | 4499 | 9428 | 10005 | NY | 2930 Southern Street |
| 4 | 1893 | 2722 | 4410 | 5873 | 10004 | NY | 2807 Geraldine Lane |
| 5 | 6105 | 7777 | 7891 | 8758 | 10467 | NY | 7778 Cherry Road |
| 6 | 8499 | 991 | 448 | 211 | 10024 | NY | 48 Winchester Avenue |
| 7 | 4799 | 6582 | 9024 | 9759 | 11214 | NY | 8735 Squaw Creek Drive |
| 8 | 8049 | 5556 | 5202 | 2373 | 10034 | NY | 267 Third Road |
| 9 | 1620 | 2027 | 4881 | 6002 | 10461 | NY | 102 Coffee Court |
| 10 | 6551 | 5188 | 3436 | 2359 | 11233 | NY | 44 W. Pheasant Street |

| | | | | | | | |
|----|------|------|------|------|-------|----|-------------------------|
| 11 | 2678 | 4068 | 4278 | 5382 | 11237 | NY | 7488 N. Marconi Ave |
| 12 | 1797 | 3548 | 3668 | 8592 | 11201 | NY | 9575 Shipley Court |
| 13 | 1314 | 1810 | 6510 | 9271 | 10025 | NY | 8156 Lake View Street |
| 14 | 4839 | 4776 | 4024 | 369 | 10032 | NY | 44 Madison Dr |
| 15 | 7079 | 7438 | 7443 | 9225 | 10011 | NY | 9848 Linden St |
| 16 | 4218 | 5072 | 5201 | 7588 | 11225 | NY | 805 South Pilgrim Court |
| 17 | 5721 | 6247 | 8495 | 9236 | 10466 | NY | 9132 Redwood Rd |
| 18 | 9179 | 8390 | 8256 | 3815 | 10040 | NY | 3 Warren Drive |
| 19 | 3485 | 4592 | 5143 | 8100 | 10468 | NY | 402 Bridgeton Lane |
| 20 | 1235 | 1822 | 7074 | 8207 | 10027 | NY | 6 E. Nichols Ave |
| 21 | 3447 | 4535 | 5476 | 9983 | 10457 | NY | 323 North Edgewood St |
| 22 | 7667 | 5952 | 1998 | 375 | 10128 | NY | 484 Thorne St |
| 23 | 2124 | 2844 | 6877 | 9570 | 10472 | NY | 861 Gonzales Lane |
| 24 | 1322 | 7279 | 8443 | 9571 | 10033 | NY | 267 Randall Mill Dr |
| 25 | 6110 | 5791 | 1759 | 969 | 11211 | NY | 12 Lees Creek St |
| 26 | 621 | 3098 | 7118 | 8433 | 10462 | NY | 240 W. Manhattan St |
| 27 | 6227 | 5123 | 4968 | 3857 | 10306 | NY | 62 Lower River Road |
| 28 | 4182 | 6087 | 7494 | 8599 | 10002 | NY | 48 S. Brandywine St |
| 29 | 2415 | 3461 | 3850 | 4657 | 11233 | NY | 5 Tallwood St |
| 30 | 3938 | 5190 | 8203 | 8780 | 11213 | NY | 77 Stillwater St |
| 31 | 286 | 6750 | 8254 | 8656 | 10701 | NY | 7061 Bishop St |
| 32 | 8484 | 7883 | 7499 | 6592 | 11221 | NY | 7223 Cedarwood Ave |
| 33 | 4866 | 4928 | 8451 | 9585 | 10462 | NY | 62 Lafayette Ave |
| 34 | 3140 | 4123 | 4366 | 9482 | 10306 | NY | 7839 Elm St |
| 35 | 3794 | 3984 | 8803 | 9338 | 11203 | NY | 429 Stonybrook Dr |
| 36 | 3751 | 4423 | 8733 | 9909 | 10461 | NY | 640 Beechwood Dr |
| 37 | 6957 | 3898 | 1857 | 1512 | 11237 | NY | 9453 N. Wagon Lane |
| 38 | 5535 | 5775 | 7661 | 9206 | 10463 | NY | 81 San Carlos Road |
| 39 | 889 | 4373 | 6803 | 7578 | 10472 | NY | 596 Coffee St |
| 40 | 5804 | 4259 | 4243 | 907 | 10033 | NY | 92 Princess St |
| 41 | 3615 | 3712 | 5819 | 9589 | 11230 | NY | 9151 River St |
| 42 | 5952 | 5914 | 5405 | 4031 | 10128 | NY | 424 Hall Ave |
| 43 | 4033 | 6956 | 7929 | 8834 | 11210 | NY | 81 Crescent St |
| 44 | 6231 | 7478 | 8039 | 8271 | 10009 | NY | 7217 Birch Hill Dr |
| 45 | 1245 | 791 | 338 | 44 | 11208 | NY | 7184 Center Court |
| 46 | 657 | 6238 | 8922 | 9081 | 10028 | NY | 815 2nd St |
| 47 | 4963 | 6292 | 6728 | 8202 | 11223 | NY | 9875 Franklin Rd |
| 48 | 4079 | 2797 | 2245 | 1696 | 11218 | NY | 601 Bank Ave |
| 49 | 2428 | 7386 | 8835 | 9766 | 10451 | NY | 21 Yukon St |
| 50 | 1768 | 2804 | 5718 | 9822 | 10025 | NY | 18 N. Woodland Ave |
| 51 | 3353 | 6351 | 8550 | 9272 | 10465 | NY | 65 Lower River Ave |
| 52 | 9610 | 7534 | 5080 | 4936 | 10032 | NY | 8680 Alderwood St |
| 53 | 4189 | 5407 | 6233 | 9681 | 11228 | NY | 8388 Gonzales St |
| 54 | 2628 | 3612 | 5066 | 5156 | 11211 | NY | 9760 Taylor Dr |
| 55 | 416 | 747 | 1028 | 6357 | 10031 | NY | 419 E. Henry Ave |
| 56 | 6541 | 3311 | 3254 | 2687 | 11209 | NY | 8083 8th St |
| 57 | 2517 | 8042 | 8222 | 9686 | 10029 | NY | 2 Rock Maple Ave |
| 58 | 3919 | 4466 | 5568 | 6476 | 10312 | NY | 9577 Nicolls Ave |
| 59 | 2254 | 4534 | 6796 | 7730 | 11224 | NY | 174 Del Monte St |

| | City |
|----|----------------|
| 0 | Brooklyn |
| 1 | New York |
| 2 | New York |
| 3 | New York |
| 4 | New York |
| 5 | Bronx |
| 6 | New York |
| 7 | Brooklyn |
| 8 | New York |
| 9 | Bronx |
| 10 | Brooklyn |
| 11 | Brooklyn |
| 12 | Brooklyn |
| 13 | New York, |
| 14 | New York |
| 15 | New York |
| 16 | Brooklyn |
| 17 | Bronx |
| 18 | New York |
| 19 | Bronx |
| 20 | New York |
| 21 | Bronx |
| 22 | New York |
| 23 | Bronx |
| 24 | New York |
| 25 | Brooklyn |
| 26 | Bronx |
| 27 | Staten Island, |
| 28 | New York |
| 29 | Brooklyn |
| 30 | Brooklyn |
| 31 | Yonkers |
| 32 | Brooklyn |
| 33 | Bronx |
| 34 | Staten Island |
| 35 | Brooklyn |
| 36 | Bronx |
| 37 | Brooklyn |
| 38 | Bronx |
| 39 | Bronx |
| 40 | New York |
| 41 | Brooklyn |
| 42 | New York |
| 43 | Brooklyn |
| 44 | New York |
| 45 | Brooklyn |
| 46 | New York |
| 47 | Brooklyn |
| 48 | Brooklyn |

```

49         Bronx
50     New York
51         Bronx
52     New York
53     Brooklyn
54     Brooklyn
55     New York
56     Brooklyn
57     New York
58     Staten Island
59     Brooklyn

```

```

df1groupby = df1.groupby('Account Type')
[2017,2018,2019,2020,2021].sum()

```

<ipython-input-163-9c3fd5d0a7d8>:1: FutureWarning: Indexing with multiple keys (implicitly converted to a tuple of keys) will be deprecated, use a list instead.

```

df1groupby = df1.groupby('Account Type')
[2017,2018,2019,2020,2021].sum()

```

df1groupby

| | 2017 | 2018 | 2019 | 2020 | 2021 |
|--------------|-------|-------|-------|--------|--------|
| Account Type | | | | | |
| Bar | 51804 | 60121 | 60760 | 75991 | 94147 |
| Club | 47259 | 67275 | 79646 | 102065 | 112270 |
| Hotel | 44888 | 50567 | 70312 | 82583 | 100592 |
| Restaurant | 46025 | 65032 | 77731 | 89595 | 102185 |

```

ax = df1.groupby('Account Type')
[2017,2018,2019,2020,2021].sum().plot.bar(figsize=(15,6))
ax.set_facecolor("black")
plt.ylabel('Account Type')
plt.ylabel('Sales by Account Type and Year')
plt.show()

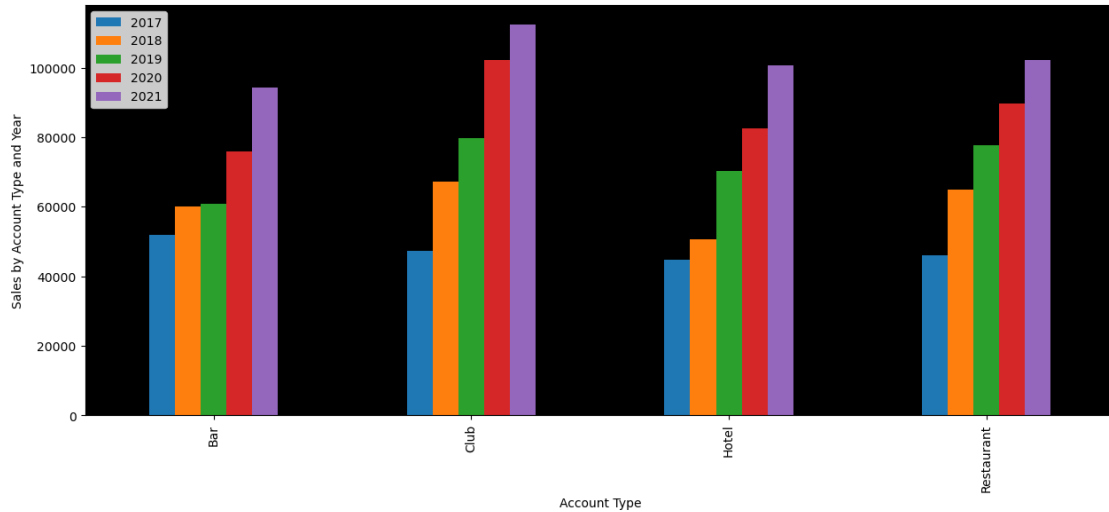
```

<ipython-input-187-db64b82cfc08>:1: FutureWarning: Indexing with multiple keys (implicitly converted to a tuple of keys) will be deprecated, use a list instead.

```

ax = df1.groupby('Account Type')
[2017,2018,2019,2020,2021].sum().plot.bar(figsize=(15,6))

```

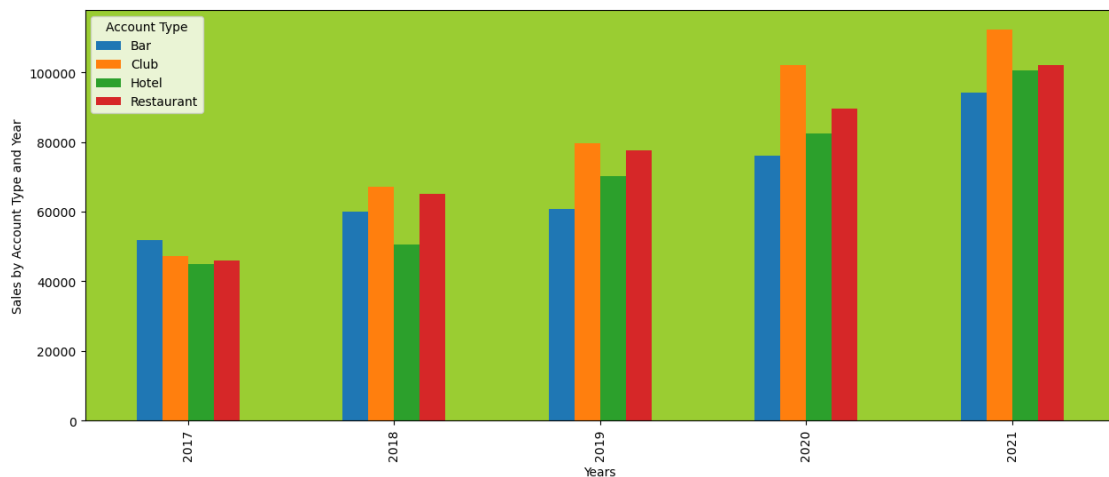



```
df1groupbyT = df1groupby.T
df1groupbyT
```

| Account Type | Bar | Club | Hotel | Restaurant |
|--------------|-------|--------|--------|------------|
| 2017 | 51804 | 47259 | 44888 | 46025 |
| 2018 | 60121 | 67275 | 50567 | 65032 |
| 2019 | 60760 | 79646 | 70312 | 77731 |
| 2020 | 75991 | 102065 | 82583 | 89595 |
| 2021 | 94147 | 112270 | 100592 | 102185 |

Total Sales by Account Type and Year

```
ax = df1groupbyT.plot.bar(figsize=(15,6))
ax.set_facecolor("yellowgreen")
plt.xlabel('Years')
plt.ylabel('Sales by Account Type and Year')
plt.show()
```



```
cols = list(df1.columns)
```

```
cols
```

```
['Decision Maker',  
 'Phone Number',  
 'Account Type',  
 'Regular',  
 'Sugar Free',  
 'Yellow Edition',  
 'Cooler?',  
 'Digital screen?',  
 'Menu inclusion?',  
 'Posters?',  
 2017,  
 2018,  
 2019,  
 2020,  
 2021,  
 'Zipcode',  
 'State',  
 'Street',  
 'City']
```

```
df2 = df1[['Street',  
 'City',  
 'State',  
 'Zipcode',  
 'Decision Maker',  
 'Phone Number',  
 'Account Type',  
 'Regular',  
 'Sugar Free',  
 'Yellow Edition',  
 'Cooler?',  
 'Digital screen?',  
 'Menu inclusion?',  
 'Posters?',  
 2017,  
 2018,  
 2019,  
 2020,  
 2021  
 ]]
```

```
df2["City"] = df2["City"].str.replace(",","")
```

```
df2
```

| | Street | City | State | Zipcode | \ |
|----|-------------------------|---------------|-------|---------|---|
| 0 | 2131 Patterson Road | Brooklyn | NY | 11201 | |
| 1 | 3685 Morningview Lane | New York | NY | 10013 | |
| 2 | 2285 Ladybug Drive | New York | NY | 10013 | |
| 3 | 2930 Southern Street | New York | NY | 10005 | |
| 4 | 2807 Geraldine Lane | New York | NY | 10004 | |
| 5 | 7778 Cherry Road | Bronx | NY | 10467 | |
| 6 | 48 Winchester Avenue | New York | NY | 10024 | |
| 7 | 8735 Squaw Creek Drive | Brooklyn | NY | 11214 | |
| 8 | 267 Third Road | New York | NY | 10034 | |
| 9 | 102 Coffee Court | Bronx | NY | 10461 | |
| 10 | 44 W. Pheasant Street | Brooklyn | NY | 11233 | |
| 11 | 7488 N. Marconi Ave | Brooklyn | NY | 11237 | |
| 12 | 9575 Shipley Court | Brooklyn | NY | 11201 | |
| 13 | 8156 Lake View Street | New York | NY | 10025 | |
| 14 | 44 Madison Dr | New York | NY | 10032 | |
| 15 | 9848 Linden St | New York | NY | 10011 | |
| 16 | 805 South Pilgrim Court | Brooklyn | NY | 11225 | |
| 17 | 9132 Redwood Rd | Bronx | NY | 10466 | |
| 18 | 3 Warren Drive | New York | NY | 10040 | |
| 19 | 402 Bridgeton Lane | Bronx | NY | 10468 | |
| 20 | 6 E. Nichols Ave | New York | NY | 10027 | |
| 21 | 323 North Edgewood St | Bronx | NY | 10457 | |
| 22 | 484 Thorne St | New York | NY | 10128 | |
| 23 | 861 Gonzales Lane | Bronx | NY | 10472 | |
| 24 | 267 Randall Mill Dr | New York | NY | 10033 | |
| 25 | 12 Lees Creek St | Brooklyn | NY | 11211 | |
| 26 | 240 W. Manhattan St | Bronx | NY | 10462 | |
| 27 | 62 Lower River Road | Staten Island | NY | 10306 | |
| 28 | 48 S. Brandywine St | New York | NY | 10002 | |
| 29 | 5 Tallwood St | Brooklyn | NY | 11233 | |
| 30 | 77 Stillwater St | Brooklyn | NY | 11213 | |
| 31 | 7061 Bishop St | Yonkers | NY | 10701 | |
| 32 | 7223 Cedarwood Ave | Brooklyn | NY | 11221 | |
| 33 | 62 Lafayette Ave | Bronx | NY | 10462 | |
| 34 | 7839 Elm St | Staten Island | NY | 10306 | |
| 35 | 429 Stonybrook Dr | Brooklyn | NY | 11203 | |
| 36 | 640 Beechwood Dr | Bronx | NY | 10461 | |
| 37 | 9453 N. Wagon Lane | Brooklyn | NY | 11237 | |
| 38 | 81 San Carlos Road | Bronx | NY | 10463 | |
| 39 | 596 Coffee St | Bronx | NY | 10472 | |
| 40 | 92 Princess St | New York | NY | 10033 | |
| 41 | 9151 River St | Brooklyn | NY | 11230 | |
| 42 | 424 Hall Ave | New York | NY | 10128 | |
| 43 | 81 Crescent St | Brooklyn | NY | 11210 | |
| 44 | 7217 Birch Hill Dr | New York | NY | 10009 | |
| 45 | 7184 Center Court | Brooklyn | NY | 11208 | |
| 46 | 815 2nd St | New York | NY | 10028 | |
| 47 | 9875 Franklin Rd | Brooklyn | NY | 11223 | |
| 48 | 601 Bank Ave | Brooklyn | NY | 11218 | |

| | | | | |
|----|--------------------|---------------|----|-------|
| 49 | 21 Yukon St | Bronx | NY | 10451 |
| 50 | 18 N. Woodland Ave | New York | NY | 10025 |
| 51 | 65 Lower River Ave | Bronx | NY | 10465 |
| 52 | 8680 Alderwood St | New York | NY | 10032 |
| 53 | 8388 Gonzales St | Brooklyn | NY | 11228 |
| 54 | 9760 Taylor Dr | Brooklyn | NY | 11211 |
| 55 | 419 E. Henry Ave | New York | NY | 10031 |
| 56 | 8083 8th St | Brooklyn | NY | 11209 |
| 57 | 2 Rock Maple Ave | New York | NY | 10029 |
| 58 | 9577 Nicolls Ave | Staten Island | NY | 10312 |
| 59 | 174 Del Monte St | Brooklyn | NY | 11224 |

| \ | Decision Maker | Phone Number | Account | Type | Regular | Sugar Free |
|----|------------------|----------------|------------|------|---------|------------|
| 0 | Dorothy Rizzo | (880) 283-6803 | | Bar | Yes | Yes |
| 1 | Lawson Moore | (711) 426-7350 | | Bar | Yes | Yes |
| 2 | Vin Hudson | (952) 952-5573 | | Bar | Yes | Yes |
| 3 | Susana Huels | (491) 505-6064 | | Bar | Yes | Yes |
| 4 | Shanna Hettinger | (412) 570-0596 | | Bar | Yes | Yes |
| 5 | Roy McGlynn | (594) 807-4187 | | Bar | Yes | Yes |
| 6 | Lorena Posacco | (678) 294-8103 | | Bar | Yes | No |
| 7 | Juanita Wisozk | (305) 531-1310 | | Bar | Yes | Yes |
| 8 | Velma Riley | (697) 543-0310 | | Bar | Yes | No |
| 9 | Holly Gaines | (277) 456-4626 | | Bar | Yes | Yes |
| 10 | Gary Brown | (459) 968-9453 | | Bar | Yes | No |
| 11 | Jeffrey Akins | (313) 417-8968 | | Bar | Yes | No |
| 12 | Tim Young | (876) 653-1727 | | Bar | Yes | Yes |
| 13 | Debra Kroll | (628) 832-4986 | | Bar | Yes | Yes |
| 14 | Kelly Boyd | (220) 929-0797 | | Bar | Yes | Yes |
| 15 | Dan Hill | (248) 450-0797 | Restaurant | | Yes | Yes |
| 16 | Javier George | (964) 214-3742 | Restaurant | | Yes | Yes |

| | | | | | | |
|----|-------------------|-------|----------|------------|-----|-----|
| 17 | Christopher Evans | (831) | 406-6300 | Restaurant | Yes | Yes |
| 18 | Julie Ross | (778) | 387-0744 | Restaurant | Yes | Yes |
| 19 | Bill Callahan | (617) | 419-7996 | Restaurant | Yes | Yes |
| 20 | Anthony Brooks | (349) | 801-7566 | Restaurant | Yes | Yes |
| 21 | Charlotte Leroux | (784) | 634-6873 | Restaurant | Yes | Yes |
| 22 | Nina Coulter | (938) | 752-9381 | Restaurant | Yes | No |
| 23 | Mia Ang | (253) | 861-1301 | Restaurant | Yes | Yes |
| 24 | Kathy Rogers | (939) | 738-6471 | Restaurant | Yes | Yes |
| 25 | Rita Varga | (754) | 696-3109 | Restaurant | Yes | No |
| 26 | Mel Berkowitz | (967) | 547-1542 | Restaurant | Yes | Yes |
| 27 | Debra Martin | (743) | 960-6716 | Restaurant | Yes | Yes |
| 28 | Deshaun Fletcher | (845) | 304-6511 | Restaurant | Yes | Yes |
| 29 | Kari Lenz | (886) | 554-5339 | Restaurant | Yes | Yes |
| 30 | John Mackey | (831) | 581-1892 | Club | Yes | Yes |
| 31 | Raymond Heywin | (571) | 843-1746 | Club | Yes | Yes |
| 32 | Janie Roberson | (924) | 516-6566 | Club | Yes | Yes |
| 33 | Brooke Hayes | (247) | 999-3394 | Club | Yes | Yes |
| 34 | Lee Niemeyer | (920) | 451-3973 | Club | Yes | Yes |
| 35 | Stephen Harris | (258) | 948-7479 | Club | Yes | Yes |
| 36 | Juan Scott | (357) | 532-0838 | Club | Yes | Yes |
| 37 | Kurt Issacs | (454) | 903-5770 | Club | Yes | No |
| 38 | Dominique Johnson | (336) | 448-7026 | Club | Yes | Yes |
| 39 | Larry Alaimo | (242) | 869-1226 | Club | Yes | Yes |
| 40 | Carlos Moya | (485) | 453-8693 | Club | Yes | No |

| | | | | | | |
|----|--------------------|-------|----------|-------|-----|-----|
| 41 | Shaun Salvatore | (691) | 657-1498 | Club | Yes | Yes |
| 42 | Annie Fuentes | (462) | 693-6254 | Club | Yes | Yes |
| 43 | Maria Sawyer | (881) | 243-5276 | Club | Yes | Yes |
| 44 | Darnell Straughter | (680) | 628-4625 | Club | Yes | Yes |
| 45 | Richard Breaux | (685) | 981-8556 | Hotel | Yes | No |
| 46 | Craig Collins | (828) | 840-2736 | Hotel | Yes | Yes |
| 47 | Donna Lam | (931) | 618-9558 | Hotel | Yes | Yes |
| 48 | Teresa Vasbinder | (261) | 690-0303 | Hotel | Yes | No |
| 49 | Andre Mobley | (597) | 701-9429 | Hotel | Yes | Yes |
| 50 | Ray Hernandez | (609) | 345-8163 | Hotel | Yes | Yes |
| 51 | Thomas Stewart | (381) | 643-1230 | Hotel | Yes | Yes |
| 52 | Henry Lange | (293) | 473-1512 | Hotel | Yes | Yes |
| 53 | Danielle Tomas | (459) | 261-2301 | Hotel | Yes | Yes |
| 54 | Joe Schimke | (936) | 816-9148 | Hotel | Yes | No |
| 55 | Carlos Jackson | (201) | 363-0653 | Hotel | Yes | Yes |
| 56 | Russell Wallace | (237) | 890-0247 | Hotel | Yes | No |
| 57 | Shameka West | (488) | 656-0761 | Hotel | Yes | Yes |
| 58 | Kevin Fleming | (650) | 848-8284 | Hotel | Yes | Yes |
| 59 | Anna Grey | (980) | 437-1451 | Hotel | Yes | Yes |

| | Yellow Edition | Cooler? | Digital screen? | Menu inclusion? | Posters? |
|--------|----------------|---------|-----------------|-----------------|----------|
| 2017 \ | | | | | |
| 0 | Yes | Yes | Yes | Yes | Yes |
| 1982 | | | | | |
| 1 | Yes | No | Yes | Yes | Yes |
| 2786 | | | | | |
| 2 | Yes | Yes | Yes | Yes | Yes |
| 1209 | | | | | |
| 3 | Yes | Yes | Yes | Yes | Yes |

| | | | | | |
|------|-----|-----|-----|-----|-----|
| 906 | | | | | |
| 4 | No | Yes | Yes | Yes | Yes |
| 1421 | | | | | |
| 5 | Yes | No | Yes | Yes | No |
| 2341 | | | | | |
| 6 | No | No | No | Yes | No |
| 9252 | | | | | |
| 7 | Yes | Yes | No | Yes | No |
| 1581 | | | | | |
| 8 | No | No | No | Yes | No |
| 9766 | | | | | |
| 9 | No | Yes | No | Yes | No |
| 1530 | | | | | |
| 10 | No | No | No | No | No |
| 7555 | | | | | |
| 11 | No | No | No | No | No |
| 1532 | | | | | |
| 12 | Yes | Yes | Yes | Yes | Yes |
| 24 | | | | | |
| 13 | Yes | Yes | Yes | Yes | Yes |
| 861 | | | | | |
| 14 | No | No | No | No | No |
| 9058 | | | | | |
| 15 | No | No | No | No | No |
| 3501 | | | | | |
| 16 | No | No | No | No | No |
| 3916 | | | | | |
| 17 | No | Yes | No | Yes | No |
| 700 | | | | | |
| 18 | No | No | No | No | No |
| 9773 | | | | | |
| 19 | No | Yes | No | Yes | No |
| 73 | | | | | |
| 20 | No | Yes | No | Yes | No |
| 238 | | | | | |
| 21 | No | Yes | No | Yes | No |
| 1368 | | | | | |
| 22 | No | No | Yes | No | No |
| 8331 | | | | | |
| 23 | No | Yes | Yes | Yes | No |
| 1779 | | | | | |
| 24 | No | Yes | Yes | Yes | No |
| 570 | | | | | |
| 25 | No | No | Yes | No | No |
| 6156 | | | | | |
| 26 | No | Yes | Yes | Yes | No |
| 209 | | | | | |
| 27 | No | No | No | No | No |
| 6309 | | | | | |
| 28 | No | Yes | No | Yes | No |

| | | | | | |
|------|-----|-----|-----|-----|-----|
| 712 | | | | | |
| 29 | No | No | No | No | No |
| 2390 | | | | | |
| 30 | Yes | No | No | Yes | No |
| 2519 | | | | | |
| 31 | Yes | Yes | Yes | Yes | No |
| 138 | | | | | |
| 32 | Yes | No | No | Yes | Yes |
| 8873 | | | | | |
| 33 | Yes | No | No | Yes | Yes |
| 3297 | | | | | |
| 34 | Yes | Yes | Yes | Yes | Yes |
| 1092 | | | | | |
| 35 | Yes | No | No | Yes | Yes |
| 2541 | | | | | |
| 36 | Yes | Yes | Yes | Yes | Yes |
| 742 | | | | | |
| 37 | No | No | No | Yes | Yes |
| 7703 | | | | | |
| 38 | Yes | Yes | Yes | Yes | Yes |
| 488 | | | | | |
| 39 | Yes | Yes | Yes | Yes | Yes |
| 376 | | | | | |
| 40 | No | No | No | Yes | Yes |
| 7840 | | | | | |
| 41 | Yes | Yes | Yes | Yes | Yes |
| 1038 | | | | | |
| 42 | No | No | No | No | No |
| 8891 | | | | | |
| 43 | Yes | Yes | No | No | No |
| 1290 | | | | | |
| 44 | Yes | Yes | Yes | No | No |
| 431 | | | | | |
| 45 | No | No | No | Yes | No |
| 8156 | | | | | |
| 46 | Yes | Yes | No | Yes | No |
| 299 | | | | | |
| 47 | Yes | No | No | Yes | No |
| 1323 | | | | | |
| 48 | No | No | No | Yes | No |
| 8466 | | | | | |
| 49 | Yes | No | No | Yes | No |
| 870 | | | | | |
| 50 | Yes | No | No | Yes | No |
| 1497 | | | | | |
| 51 | Yes | No | No | Yes | No |
| 1082 | | | | | |
| 52 | No | No | No | Yes | No |
| 9791 | | | | | |
| 53 | Yes | No | No | Yes | No |

| | | | | | |
|------|-----|-----|----|-----|----|
| 1357 | | | | | |
| 54 | No | No | No | Yes | No |
| 576 | | | | | |
| 55 | Yes | Yes | No | No | No |
| 128 | | | | | |
| 56 | No | No | No | No | No |
| 8034 | | | | | |
| 57 | Yes | No | No | No | No |
| 1263 | | | | | |
| 58 | Yes | No | No | No | No |
| 1032 | | | | | |
| 59 | Yes | No | No | No | No |
| 1014 | | | | | |

| | 2018 | 2019 | 2020 | 2021 |
|----|------|------|------|------|
| 0 | 5388 | 7063 | 7208 | 9093 |
| 1 | 3804 | 4121 | 6210 | 6909 |
| 2 | 1534 | 1634 | 4302 | 9768 |
| 3 | 1251 | 2897 | 4499 | 9428 |
| 4 | 1893 | 2722 | 4410 | 5873 |
| 5 | 6105 | 7777 | 7891 | 8758 |
| 6 | 8499 | 991 | 448 | 211 |
| 7 | 4799 | 6582 | 9024 | 9759 |
| 8 | 8049 | 5556 | 5202 | 2373 |
| 9 | 1620 | 2027 | 4881 | 6002 |
| 10 | 6551 | 5188 | 3436 | 2359 |
| 11 | 2678 | 4068 | 4278 | 5382 |
| 12 | 1797 | 3548 | 3668 | 8592 |
| 13 | 1314 | 1810 | 6510 | 9271 |
| 14 | 4839 | 4776 | 4024 | 369 |
| 15 | 7079 | 7438 | 7443 | 9225 |
| 16 | 4218 | 5072 | 5201 | 7588 |
| 17 | 5721 | 6247 | 8495 | 9236 |
| 18 | 9179 | 8390 | 8256 | 3815 |
| 19 | 3485 | 4592 | 5143 | 8100 |
| 20 | 1235 | 1822 | 7074 | 8207 |
| 21 | 3447 | 4535 | 5476 | 9983 |
| 22 | 7667 | 5952 | 1998 | 375 |
| 23 | 2124 | 2844 | 6877 | 9570 |
| 24 | 1322 | 7279 | 8443 | 9571 |
| 25 | 6110 | 5791 | 1759 | 969 |
| 26 | 621 | 3098 | 7118 | 8433 |
| 27 | 6227 | 5123 | 4968 | 3857 |
| 28 | 4182 | 6087 | 7494 | 8599 |
| 29 | 2415 | 3461 | 3850 | 4657 |
| 30 | 3938 | 5190 | 8203 | 8780 |
| 31 | 286 | 6750 | 8254 | 8656 |
| 32 | 8484 | 7883 | 7499 | 6592 |
| 33 | 4866 | 4928 | 8451 | 9585 |
| 34 | 3140 | 4123 | 4366 | 9482 |

```

35  3794  3984  8803  9338
36  3751  4423  8733  9909
37  6957  3898  1857  1512
38  5535  5775  7661  9206
39   889  4373  6803  7578
40  5804  4259  4243   907
41  3615  3712  5819  9589
42  5952  5914  5405  4031
43  4033  6956  7929  8834
44  6231  7478  8039  8271
45  1245   791   338    44
46   657  6238  8922  9081
47  4963  6292  6728  8202
48  4079  2797  2245  1696
49  2428  7386  8835  9766
50  1768  2804  5718  9822
51  3353  6351  8550  9272
52  9610  7534  5080  4936
53  4189  5407  6233  9681
54  2628  3612  5066  5156
55   416   747  1028  6357
56  6541  3311  3254  2687
57  2517  8042  8222  9686
58  3919  4466  5568  6476
59  2254  4534  6796  7730

```

```
df2.groupby('Account Type')[2017,2018,2019,2020,2021].sum()
```

```
<ipython-input-128-c6dd21c9290f>:1: FutureWarning: Indexing with
multiple keys (implicitly converted to a tuple of keys) will be
deprecated, use a list instead.
```

```
df2.groupby('Account Type')[2017,2018,2019,2020,2021].sum()
```

| | 2017 | 2018 | 2019 | 2020 | 2021 |
|--------------|-------|-------|-------|--------|--------|
| Account Type | | | | | |
| Bar | 51804 | 60121 | 60760 | 75991 | 94147 |
| Club | 47259 | 67275 | 79646 | 102065 | 112270 |
| Hotel | 44888 | 50567 | 70312 | 82583 | 100592 |
| Restaurant | 46025 | 65032 | 77731 | 89595 | 102185 |

```
# Multiple columns string conversion
```

```
df2 =
```

```
df2.astype({2017:'int',2018:'int',2019:'int',2020:'int',2021:'int'})
```

```
TotalRegular = df2['Regular'].value_counts().rename_axis('Type
Regular').reset_index(name='Total Regular')
```

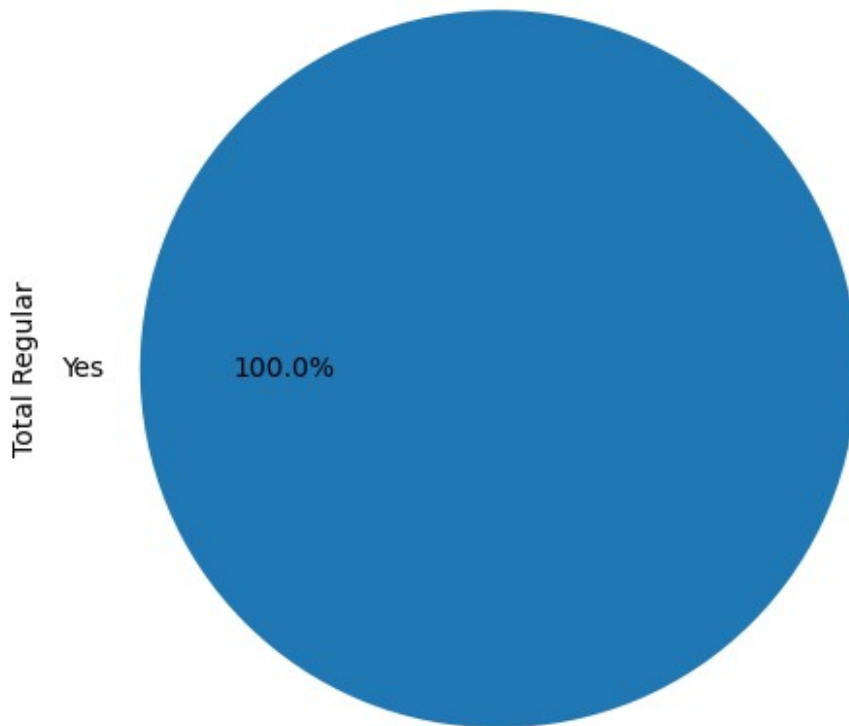
```
TotalRegular
```

| | Type Regular | Total Regular |
|---|--------------|---------------|
| 0 | Yes | 60 |

```

indexTotalRegular = TotalRegular.set_index('Type Regular')
indexTotalRegular['Total Regular'].plot.pie(figsize=(15,6),autopct
='%1.1f%%')
plt.show()

```



Interpretation:

60 customers order regular flavor of red bull. All customers order regular flavor.

```

TotalYellowEdition = df2['Yellow
Edition'].value_counts().rename_axis('Type Yellow
Edition').reset_index(name='Total Yellow Edition Free')
TotalYellowEdition

```

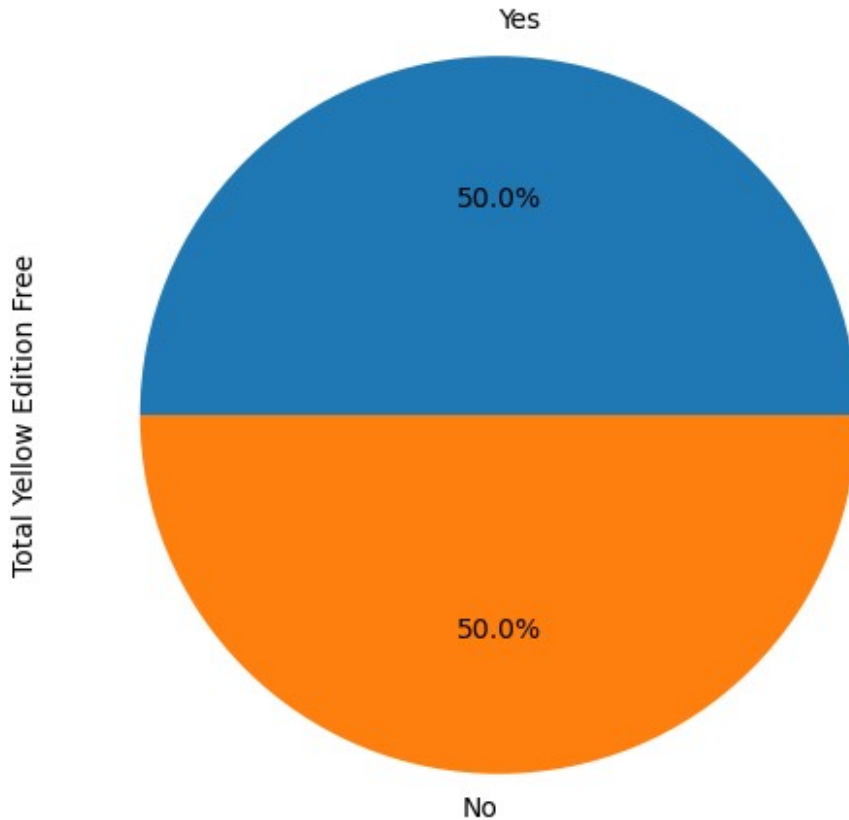
| | Type Yellow Edition | Total Yellow Edition Free |
|---|---------------------|---------------------------|
| 0 | Yes | 30 |
| 1 | No | 30 |

```

indexTotalYellowEdition = TotalYellowEdition.set_index('Type Yellow
Edition')

```

```
indexTotalYellowEdition['Total Yellow Edition
Free'].plot.pie(figsize=(15,6),autopct = '%1.1f%%')
plt.show()
```



Interpretation:

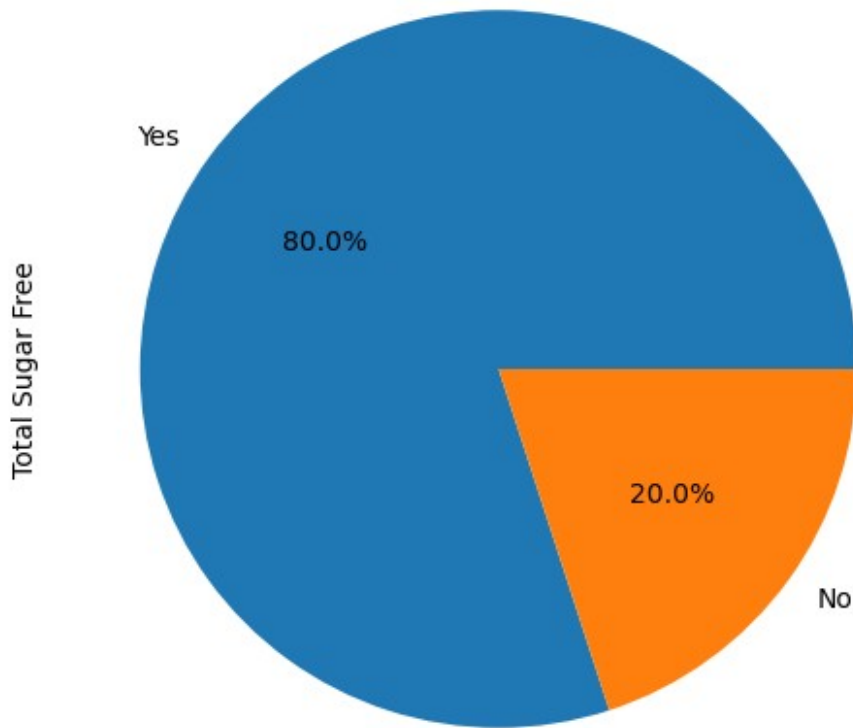
30 customers order the Yellow Edition Free flavor and 30 customers do not order the Yellow Edition Free flavor. 50% of customers order the Yellow Edition Free flavor and 50% do not.

```
TotalSugarFree = df2['Sugar Free'].value_counts().rename_axis('Type
Sugar Free').reset_index(name='Total Sugar Free')
TotalSugarFree
```

| | Type Sugar Free | Total Sugar Free |
|---|-----------------|------------------|
| 0 | Yes | 48 |
| 1 | No | 12 |

```
indexTotalSugarFree = TotalSugarFree.set_index('Type Sugar Free')
```

```
indexTotalSugarFree['Total Sugar
Free'].plot.pie(figsize=(15,6),autopct = '%1.1f%%')
plt.show()
```



Interpretation:

48 customers order Sugar Free flavor and 12 customers do not order Sugar Free flavor or 80% of customers order Sugar Free flavor and 20% do not.

```
TotalCooler = df2['Cooler?'].value_counts().rename_axis('Type
Cooler?').reset_index(name='Total Cooler?')
TotalCooler
```

| | Type Cooler? | Total Cooler? |
|---|--------------|---------------|
| 0 | No | 34 |
| 1 | Yes | 26 |

```
TotalDigitalscreen = df2['Digital
screen?'].value_counts().rename_axis('Type Digital
screen?').reset_index(name='Total Digital screen?')
TotalDigitalscreen
```

| | Type Digital screen? | Total Digital screen? |
|---|----------------------|-----------------------|
| 0 | No | 40 |
| 1 | Yes | 20 |

```
TotalMenuinclusion = df2['Menu
inclusion?'].value_counts().rename_axis('Type Menu
inclusion?').reset_index(name='Total Menu inclusion?')
TotalMenuinclusion
```

| | Type Menu inclusion? | Total Menu inclusion? |
|---|----------------------|-----------------------|
| 0 | Yes | 42 |
| 1 | No | 18 |

```
TotalPosters = df2['Posters?'].value_counts().rename_axis('Type
Posters?').reset_index(name='Total Posters?')
TotalPosters
```

| | Type Posters? | Total Posters? |
|---|---------------|----------------|
| 0 | No | 43 |
| 1 | Yes | 17 |

Total customer by account type

```
TotalAccountType = df2['Account
Type'].value_counts().rename_axis('Account
Type').reset_index(name='Total Account Type')
TotalAccountType
```

| | Account Type | Total Account Type |
|---|--------------|--------------------|
| 0 | Bar | 15 |
| 1 | Restaurant | 15 |
| 2 | Club | 15 |
| 3 | Hotel | 15 |

Total Customers By City

```
TotalCustomerByCity =
df2['City'].value_counts().rename_axis('Cities').reset_index(name='Cus
tomers By City')
#TotalCustomerByCity.set_index('Cities')
```

TotalCustomerByCity

| | Cities | Customers By City |
|---|---------------|-------------------|
| 0 | New York | 22 |
| 1 | Brooklyn | 21 |
| 2 | Bronx | 13 |
| 3 | Staten Island | 3 |
| 4 | Yonkers | 1 |

```

indexTotalCustomerByCity = TotalCustomerByCity.set_index('Cities') #
or

TotalCustomerByCity =
df2['City'].value_counts().rename_axis('Cities').reset_index(name='Customers By City')
TotalCustomerByCity.set_index('Cities')

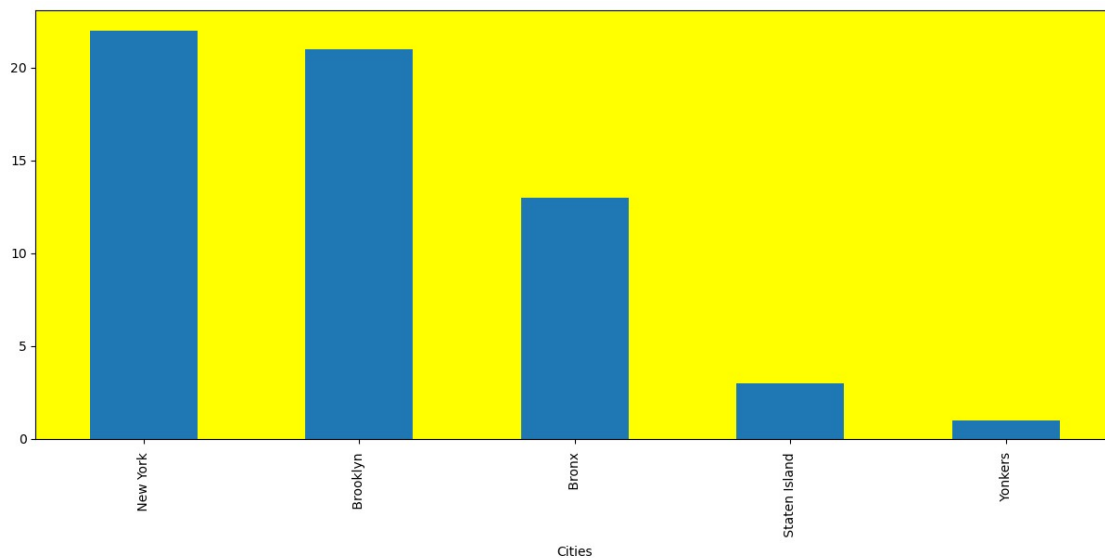
```

| Customers By City | |
|-------------------|----|
| Cities | |
| New York | 22 |
| Brooklyn | 21 |
| Bronx | 13 |
| Staten Island | 3 |
| Yonkers | 1 |

```

ax = indexTotalCustomerByCity['Customers By City'].plot.bar(figsize=(15,6))
ax.set_facecolor("yellow")
plt.show()

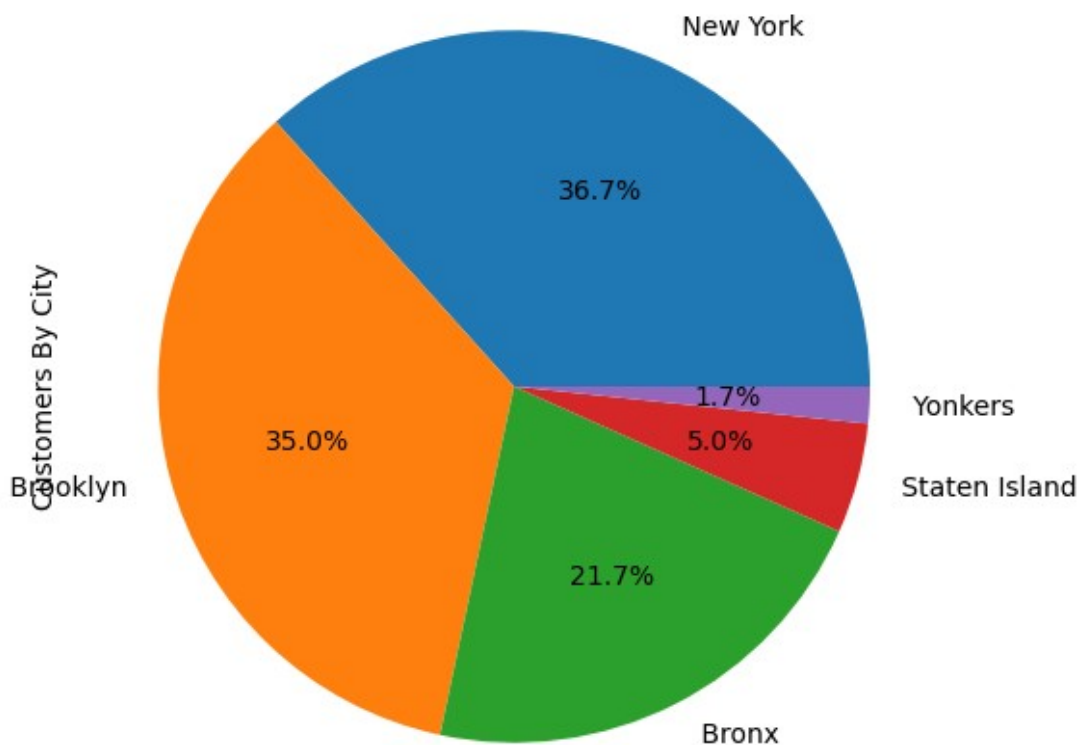
```



```

indexTotalCustomerByCity['Customers By City'].plot.pie(figsize=(15,6), autopct = '%1.1f%%')
plt.show()

```



Total number of customers by postal code

```
TotalCustomerZipcode = df2['Zipcode'].value_counts().rename_axis('Zip
code').reset_index(name='Customers By Zip code')
TotalCustomerZipcode
```

| | Zip code | Customers By Zip code |
|----|----------|-----------------------|
| 0 | 11201 | 2 |
| 1 | 11237 | 2 |
| 2 | 10306 | 2 |
| 3 | 10462 | 2 |
| 4 | 10013 | 2 |
| 5 | 10033 | 2 |
| 6 | 10472 | 2 |
| 7 | 10128 | 2 |
| 8 | 10032 | 2 |
| 9 | 10025 | 2 |
| 10 | 11211 | 2 |
| 11 | 11233 | 2 |
| 12 | 10461 | 2 |
| 13 | 10463 | 1 |
| 14 | 11230 | 1 |

| | | |
|----|-------|---|
| 15 | 11210 | 1 |
| 16 | 10009 | 1 |
| 17 | 11208 | 1 |
| 18 | 10028 | 1 |
| 19 | 11223 | 1 |
| 20 | 11218 | 1 |
| 21 | 10451 | 1 |
| 22 | 10465 | 1 |
| 23 | 11228 | 1 |
| 24 | 10031 | 1 |
| 25 | 11209 | 1 |
| 26 | 10029 | 1 |
| 27 | 10312 | 1 |
| 28 | 11203 | 1 |
| 29 | 11221 | 1 |
| 30 | 10701 | 1 |
| 31 | 10457 | 1 |
| 32 | 10011 | 1 |
| 33 | 11225 | 1 |
| 34 | 10466 | 1 |
| 35 | 10040 | 1 |
| 36 | 10468 | 1 |
| 37 | 10027 | 1 |
| 38 | 10034 | 1 |
| 39 | 11213 | 1 |
| 40 | 11214 | 1 |
| 41 | 10024 | 1 |
| 42 | 10467 | 1 |
| 43 | 10004 | 1 |
| 44 | 10005 | 1 |
| 45 | 10002 | 1 |
| 46 | 11224 | 1 |

```
DfSumSaleYear = df2[['Decision Maker', 'Account
Type', 2017, 2018, 2019, 2020, 2021]]
```

DfSumSaleYear

| | Decision Maker | Account | Type | 2017 | 2018 | 2019 | 2020 | 2021 |
|----|------------------|---------|------|------|------|------|------|------|
| 0 | Dorothy Rizzo | | Bar | 1982 | 5388 | 7063 | 7208 | 9093 |
| 1 | Lawson Moore | | Bar | 2786 | 3804 | 4121 | 6210 | 6909 |
| 2 | Vin Hudson | | Bar | 1209 | 1534 | 1634 | 4302 | 9768 |
| 3 | Susana Huels | | Bar | 906 | 1251 | 2897 | 4499 | 9428 |
| 4 | Shanna Hettinger | | Bar | 1421 | 1893 | 2722 | 4410 | 5873 |
| 5 | Roy McGlynn | | Bar | 2341 | 6105 | 7777 | 7891 | 8758 |
| 6 | Lorena Posacco | | Bar | 9252 | 8499 | 991 | 448 | 211 |
| 7 | Juanita Wisozk | | Bar | 1581 | 4799 | 6582 | 9024 | 9759 |
| 8 | Velma Riley | | Bar | 9766 | 8049 | 5556 | 5202 | 2373 |
| 9 | Holly Gaines | | Bar | 1530 | 1620 | 2027 | 4881 | 6002 |
| 10 | Gary Brown | | Bar | 7555 | 6551 | 5188 | 3436 | 2359 |
| 11 | Jeffrey Akins | | Bar | 1532 | 2678 | 4068 | 4278 | 5382 |

| | | | | | | | |
|----|--------------------|------------|------|------|------|------|------|
| 12 | Tim Young | Bar | 24 | 1797 | 3548 | 3668 | 8592 |
| 13 | Debra Kroll | Bar | 861 | 1314 | 1810 | 6510 | 9271 |
| 14 | Kelly Boyd | Bar | 9058 | 4839 | 4776 | 4024 | 369 |
| 15 | Dan Hill | Restaurant | 3501 | 7079 | 7438 | 7443 | 9225 |
| 16 | Javier George | Restaurant | 3916 | 4218 | 5072 | 5201 | 7588 |
| 17 | Christopher Evans | Restaurant | 700 | 5721 | 6247 | 8495 | 9236 |
| 18 | Julie Ross | Restaurant | 9773 | 9179 | 8390 | 8256 | 3815 |
| 19 | Bill Callahan | Restaurant | 73 | 3485 | 4592 | 5143 | 8100 |
| 20 | Anthony Brooks | Restaurant | 238 | 1235 | 1822 | 7074 | 8207 |
| 21 | Charlotte Leroux | Restaurant | 1368 | 3447 | 4535 | 5476 | 9983 |
| 22 | Nina Coulter | Restaurant | 8331 | 7667 | 5952 | 1998 | 375 |
| 23 | Mia Ang | Restaurant | 1779 | 2124 | 2844 | 6877 | 9570 |
| 24 | Kathy Rogers | Restaurant | 570 | 1322 | 7279 | 8443 | 9571 |
| 25 | Rita Varga | Restaurant | 6156 | 6110 | 5791 | 1759 | 969 |
| 26 | Mel Berkowitz | Restaurant | 209 | 621 | 3098 | 7118 | 8433 |
| 27 | Debra Martin | Restaurant | 6309 | 6227 | 5123 | 4968 | 3857 |
| 28 | Deshaun Fletcher | Restaurant | 712 | 4182 | 6087 | 7494 | 8599 |
| 29 | Kari Lenz | Restaurant | 2390 | 2415 | 3461 | 3850 | 4657 |
| 30 | John Mackey | Club | 2519 | 3938 | 5190 | 8203 | 8780 |
| 31 | Raymond Heywin | Club | 138 | 286 | 6750 | 8254 | 8656 |
| 32 | Janie Roberson | Club | 8873 | 8484 | 7883 | 7499 | 6592 |
| 33 | Brooke Hayes | Club | 3297 | 4866 | 4928 | 8451 | 9585 |
| 34 | Lee Niemeyer | Club | 1092 | 3140 | 4123 | 4366 | 9482 |
| 35 | Stephen Harris | Club | 2541 | 3794 | 3984 | 8803 | 9338 |
| 36 | Juan Scott | Club | 742 | 3751 | 4423 | 8733 | 9909 |
| 37 | Kurt Issacs | Club | 7703 | 6957 | 3898 | 1857 | 1512 |
| 38 | Dominique Johnson | Club | 488 | 5535 | 5775 | 7661 | 9206 |
| 39 | Larry Alaimo | Club | 376 | 889 | 4373 | 6803 | 7578 |
| 40 | Carlos Moya | Club | 7840 | 5804 | 4259 | 4243 | 907 |
| 41 | Shaun Salvatore | Club | 1038 | 3615 | 3712 | 5819 | 9589 |
| 42 | Annie Fuentes | Club | 8891 | 5952 | 5914 | 5405 | 4031 |
| 43 | Maria Sawyer | Club | 1290 | 4033 | 6956 | 7929 | 8834 |
| 44 | Darnell Straughter | Club | 431 | 6231 | 7478 | 8039 | 8271 |
| 45 | Richard Breaux | Hotel | 8156 | 1245 | 791 | 338 | 44 |
| 46 | Craig Collins | Hotel | 299 | 657 | 6238 | 8922 | 9081 |
| 47 | Donna Lam | Hotel | 1323 | 4963 | 6292 | 6728 | 8202 |
| 48 | Teresa Vasbinder | Hotel | 8466 | 4079 | 2797 | 2245 | 1696 |
| 49 | Andre Mobley | Hotel | 870 | 2428 | 7386 | 8835 | 9766 |
| 50 | Ray Hernandez | Hotel | 1497 | 1768 | 2804 | 5718 | 9822 |
| 51 | Thomas Stewart | Hotel | 1082 | 3353 | 6351 | 8550 | 9272 |
| 52 | Henry Lange | Hotel | 9791 | 9610 | 7534 | 5080 | 4936 |
| 53 | Danielle Tomas | Hotel | 1357 | 4189 | 5407 | 6233 | 9681 |
| 54 | Joe Schimke | Hotel | 576 | 2628 | 3612 | 5066 | 5156 |
| 55 | Carlos Jackson | Hotel | 128 | 416 | 747 | 1028 | 6357 |
| 56 | Russell Wallace | Hotel | 8034 | 6541 | 3311 | 3254 | 2687 |
| 57 | Shameka West | Hotel | 1263 | 2517 | 8042 | 8222 | 9686 |
| 58 | Kevin Fleming | Hotel | 1032 | 3919 | 4466 | 5568 | 6476 |
| 59 | Anna Grey | Hotel | 1014 | 2254 | 4534 | 6796 | 7730 |

```
DfSumSaleYear["Business Name"] = DfSumSaleYear["Account Type"] + " " +
DfSumSaleYear["Decision Maker"]
```

<ipython-input-161-7964e816cecb>:1: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation:

https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy

```
DfSumSaleYear["Business Name"] = DfSumSaleYear["Account Type"] + " "
+ DfSumSaleYear["Decision Maker"]
```

DfSumSaleYear

| | Decision Maker | Account Type | 2017 | 2018 | 2019 | 2020 | 2021 | \ |
|----|-------------------|--------------|------|------|------|------|------|---|
| 0 | Dorothy Rizzo | Bar | 1982 | 5388 | 7063 | 7208 | 9093 | |
| 1 | Lawson Moore | Bar | 2786 | 3804 | 4121 | 6210 | 6909 | |
| 2 | Vin Hudson | Bar | 1209 | 1534 | 1634 | 4302 | 9768 | |
| 3 | Susana Huels | Bar | 906 | 1251 | 2897 | 4499 | 9428 | |
| 4 | Shanna Hettinger | Bar | 1421 | 1893 | 2722 | 4410 | 5873 | |
| 5 | Roy McGlynn | Bar | 2341 | 6105 | 7777 | 7891 | 8758 | |
| 6 | Lorena Posacco | Bar | 9252 | 8499 | 991 | 448 | 211 | |
| 7 | Juanita Wisozk | Bar | 1581 | 4799 | 6582 | 9024 | 9759 | |
| 8 | Velma Riley | Bar | 9766 | 8049 | 5556 | 5202 | 2373 | |
| 9 | Holly Gaines | Bar | 1530 | 1620 | 2027 | 4881 | 6002 | |
| 10 | Gary Brown | Bar | 7555 | 6551 | 5188 | 3436 | 2359 | |
| 11 | Jeffrey Akins | Bar | 1532 | 2678 | 4068 | 4278 | 5382 | |
| 12 | Tim Young | Bar | 24 | 1797 | 3548 | 3668 | 8592 | |
| 13 | Debra Kroll | Bar | 861 | 1314 | 1810 | 6510 | 9271 | |
| 14 | Kelly Boyd | Bar | 9058 | 4839 | 4776 | 4024 | 369 | |
| 15 | Dan Hill | Restaurant | 3501 | 7079 | 7438 | 7443 | 9225 | |
| 16 | Javier George | Restaurant | 3916 | 4218 | 5072 | 5201 | 7588 | |
| 17 | Christopher Evans | Restaurant | 700 | 5721 | 6247 | 8495 | 9236 | |
| 18 | Julie Ross | Restaurant | 9773 | 9179 | 8390 | 8256 | 3815 | |
| 19 | Bill Callahan | Restaurant | 73 | 3485 | 4592 | 5143 | 8100 | |
| 20 | Anthony Brooks | Restaurant | 238 | 1235 | 1822 | 7074 | 8207 | |
| 21 | Charlotte Leroux | Restaurant | 1368 | 3447 | 4535 | 5476 | 9983 | |
| 22 | Nina Coulter | Restaurant | 8331 | 7667 | 5952 | 1998 | 375 | |
| 23 | Mia Ang | Restaurant | 1779 | 2124 | 2844 | 6877 | 9570 | |
| 24 | Kathy Rogers | Restaurant | 570 | 1322 | 7279 | 8443 | 9571 | |
| 25 | Rita Varga | Restaurant | 6156 | 6110 | 5791 | 1759 | 969 | |
| 26 | Mel Berkowitz | Restaurant | 209 | 621 | 3098 | 7118 | 8433 | |
| 27 | Debra Martin | Restaurant | 6309 | 6227 | 5123 | 4968 | 3857 | |
| 28 | Deshaun Fletcher | Restaurant | 712 | 4182 | 6087 | 7494 | 8599 | |
| 29 | Kari Lenz | Restaurant | 2390 | 2415 | 3461 | 3850 | 4657 | |
| 30 | John Mackey | Club | 2519 | 3938 | 5190 | 8203 | 8780 | |
| 31 | Raymond Heywin | Club | 138 | 286 | 6750 | 8254 | 8656 | |
| 32 | Janie Roberson | Club | 8873 | 8484 | 7883 | 7499 | 6592 | |
| 33 | Brooke Hayes | Club | 3297 | 4866 | 4928 | 8451 | 9585 | |
| 34 | Lee Niemeyer | Club | 1092 | 3140 | 4123 | 4366 | 9482 | |

| | | | | | | | |
|----|--------------------|-------|------|------|------|------|------|
| 35 | Stephen Harris | Club | 2541 | 3794 | 3984 | 8803 | 9338 |
| 36 | Juan Scott | Club | 742 | 3751 | 4423 | 8733 | 9909 |
| 37 | Kurt Issacs | Club | 7703 | 6957 | 3898 | 1857 | 1512 |
| 38 | Dominique Johnson | Club | 488 | 5535 | 5775 | 7661 | 9206 |
| 39 | Larry Alaimo | Club | 376 | 889 | 4373 | 6803 | 7578 |
| 40 | Carlos Moya | Club | 7840 | 5804 | 4259 | 4243 | 907 |
| 41 | Shaun Salvatore | Club | 1038 | 3615 | 3712 | 5819 | 9589 |
| 42 | Annie Fuentes | Club | 8891 | 5952 | 5914 | 5405 | 4031 |
| 43 | Maria Sawyer | Club | 1290 | 4033 | 6956 | 7929 | 8834 |
| 44 | Darnell Straughter | Club | 431 | 6231 | 7478 | 8039 | 8271 |
| 45 | Richard Breaux | Hotel | 8156 | 1245 | 791 | 338 | 44 |
| 46 | Craig Collins | Hotel | 299 | 657 | 6238 | 8922 | 9081 |
| 47 | Donna Lam | Hotel | 1323 | 4963 | 6292 | 6728 | 8202 |
| 48 | Teresa Vasbinder | Hotel | 8466 | 4079 | 2797 | 2245 | 1696 |
| 49 | Andre Mobley | Hotel | 870 | 2428 | 7386 | 8835 | 9766 |
| 50 | Ray Hernandez | Hotel | 1497 | 1768 | 2804 | 5718 | 9822 |
| 51 | Thomas Stewart | Hotel | 1082 | 3353 | 6351 | 8550 | 9272 |
| 52 | Henry Lange | Hotel | 9791 | 9610 | 7534 | 5080 | 4936 |
| 53 | Danielle Tomas | Hotel | 1357 | 4189 | 5407 | 6233 | 9681 |
| 54 | Joe Schimke | Hotel | 576 | 2628 | 3612 | 5066 | 5156 |
| 55 | Carlos Jackson | Hotel | 128 | 416 | 747 | 1028 | 6357 |
| 56 | Russell Wallace | Hotel | 8034 | 6541 | 3311 | 3254 | 2687 |
| 57 | Shameka West | Hotel | 1263 | 2517 | 8042 | 8222 | 9686 |
| 58 | Kevin Fleming | Hotel | 1032 | 3919 | 4466 | 5568 | 6476 |
| 59 | Anna Grey | Hotel | 1014 | 2254 | 4534 | 6796 | 7730 |

| | Business Name |
|----|------------------------------|
| 0 | Bar Dorothy Rizzo |
| 1 | Bar Lawson Moore |
| 2 | Bar Vin Hudson |
| 3 | Bar Susana Huels |
| 4 | Bar Shanna Hettinger |
| 5 | Bar Roy McGlynn |
| 6 | Bar Lorena Posacco |
| 7 | Bar Juanita Wisozk |
| 8 | Bar Velma Riley |
| 9 | Bar Holly Gaines |
| 10 | Bar Gary Brown |
| 11 | Bar Jeffrey Akins |
| 12 | Bar Tim Young |
| 13 | Bar Debra Kroll |
| 14 | Bar Kelly Boyd |
| 15 | Restaurant Dan Hill |
| 16 | Restaurant Javier George |
| 17 | Restaurant Christopher Evans |
| 18 | Restaurant Julie Ross |
| 19 | Restaurant Bill Callahan |
| 20 | Restaurant Anthony Brooks |
| 21 | Restaurant Charlotte Leroux |
| 22 | Restaurant Nina Coulter |

```

23         Restaurant Mia Ang
24     Restaurant Kathy Rogers
25         Restaurant Rita Varga
26     Restaurant Mel Berkowitz
27         Restaurant Debra Martin
28 Restaurant Deshaun Fletcher
29         Restaurant Kari Lenz
30             Club John Mackey
31         Club Raymond Heywin
32         Club Janie Roberson
33             Club Brooke Hayes
34             Club Lee Niemeyer
35         Club Stephen Harris
36             Club Juan Scott
37             Club Kurt Issacs
38     Club Dominique Johnson
39         Club Larry Alaimo
40             Club Carlos Moya
41         Club Shaun Salvatore
42             Club Annie Fuentes
43             Club Maria Sawyer
44 Club Darnell Straughter
45     Hotel Richard BreauX
46         Hotel Craig Collins
47             Hotel Donna Lam
48     Hotel Teresa Vasbinder
49         Hotel Andre Mobley
50         Hotel Ray Hernandez
51         Hotel Thomas Stewart
52             Hotel Henry Lange
53         Hotel Danielle Tomas
54             Hotel Joe Schimke
55         Hotel Carlos Jackson
56     Hotel Russell Wallace
57         Hotel Shameka West
58         Hotel Kevin Fleming
59             Hotel Anna Grey

```

```

# shift column 'Name' to first position
first_column = DfSumSaleYear.pop('Business Name')
# insert column using insert(position,column_name, first_column)
function
DfSumSaleYear.insert(0, 'Business Name', first_column)

```

DfSumSaleYear

| | | Business Name | Decision Maker | Account Type |
|------|--------|-------------------|----------------|--------------|
| 2017 | 2018 \ | | | |
| 0 | | Bar Dorothy Rizzo | Dorothy Rizzo | Bar |
| 1982 | 5388 | | | |
| 1 | | Bar Lawson Moore | Lawson Moore | Bar |

| | | | | |
|------|------|------------------------------|-------------------|------------|
| 2786 | 3804 | | | |
| 2 | | Bar Vin Hudson | Vin Hudson | Bar |
| 1209 | 1534 | | | |
| 3 | | Bar Susana Huel | Susana Huel | Bar |
| 906 | 1251 | | | |
| 4 | | Bar Shanna Hettinger | Shanna Hettinger | Bar |
| 1421 | 1893 | | | |
| 5 | | Bar Roy McGlynn | Roy McGlynn | Bar |
| 2341 | 6105 | | | |
| 6 | | Bar Lorena Posacco | Lorena Posacco | Bar |
| 9252 | 8499 | | | |
| 7 | | Bar Juanita Wisozk | Juanita Wisozk | Bar |
| 1581 | 4799 | | | |
| 8 | | Bar Velma Riley | Velma Riley | Bar |
| 9766 | 8049 | | | |
| 9 | | Bar Holly Gaines | Holly Gaines | Bar |
| 1530 | 1620 | | | |
| 10 | | Bar Gary Brown | Gary Brown | Bar |
| 7555 | 6551 | | | |
| 11 | | Bar Jeffrey Akins | Jeffrey Akins | Bar |
| 1532 | 2678 | | | |
| 12 | | Bar Tim Young | Tim Young | Bar |
| 24 | 1797 | | | |
| 13 | | Bar Debra Kroll | Debra Kroll | Bar |
| 861 | 1314 | | | |
| 14 | | Bar Kelly Boyd | Kelly Boyd | Bar |
| 9058 | 4839 | | | |
| 15 | | Restaurant Dan Hill | Dan Hill | Restaurant |
| 3501 | 7079 | | | |
| 16 | | Restaurant Javier George | Javier George | Restaurant |
| 3916 | 4218 | | | |
| 17 | | Restaurant Christopher Evans | Christopher Evans | Restaurant |
| 700 | 5721 | | | |
| 18 | | Restaurant Julie Ross | Julie Ross | Restaurant |
| 9773 | 9179 | | | |
| 19 | | Restaurant Bill Callahan | Bill Callahan | Restaurant |
| 73 | 3485 | | | |
| 20 | | Restaurant Anthony Brooks | Anthony Brooks | Restaurant |
| 238 | 1235 | | | |
| 21 | | Restaurant Charlotte Leroux | Charlotte Leroux | Restaurant |
| 1368 | 3447 | | | |
| 22 | | Restaurant Nina Coulter | Nina Coulter | Restaurant |
| 8331 | 7667 | | | |
| 23 | | Restaurant Mia Ang | Mia Ang | Restaurant |
| 1779 | 2124 | | | |
| 24 | | Restaurant Kathy Rogers | Kathy Rogers | Restaurant |
| 570 | 1322 | | | |
| 25 | | Restaurant Rita Varga | Rita Varga | Restaurant |
| 6156 | 6110 | | | |
| 26 | | Restaurant Mel Berkowitz | Mel Berkowitz | Restaurant |

| | | | | |
|------|------|-----------------------------|--------------------|------------|
| 209 | 621 | | | |
| 27 | | Restaurant Debra Martin | Debra Martin | Restaurant |
| 6309 | 6227 | | | |
| 28 | | Restaurant Deshaun Fletcher | Deshaun Fletcher | Restaurant |
| 712 | 4182 | | | |
| 29 | | Restaurant Kari Lenz | Kari Lenz | Restaurant |
| 2390 | 2415 | | | |
| 30 | | Club John Mackey | John Mackey | Club |
| 2519 | 3938 | | | |
| 31 | | Club Raymond Heywin | Raymond Heywin | Club |
| 138 | 286 | | | |
| 32 | | Club Janie Roberson | Janie Roberson | Club |
| 8873 | 8484 | | | |
| 33 | | Club Brooke Hayes | Brooke Hayes | Club |
| 3297 | 4866 | | | |
| 34 | | Club Lee Niemeyer | Lee Niemeyer | Club |
| 1092 | 3140 | | | |
| 35 | | Club Stephen Harris | Stephen Harris | Club |
| 2541 | 3794 | | | |
| 36 | | Club Juan Scott | Juan Scott | Club |
| 742 | 3751 | | | |
| 37 | | Club Kurt Issacs | Kurt Issacs | Club |
| 7703 | 6957 | | | |
| 38 | | Club Dominique Johnson | Dominique Johnson | Club |
| 488 | 5535 | | | |
| 39 | | Club Larry Alaimo | Larry Alaimo | Club |
| 376 | 889 | | | |
| 40 | | Club Carlos Moya | Carlos Moya | Club |
| 7840 | 5804 | | | |
| 41 | | Club Shaun Salvatore | Shaun Salvatore | Club |
| 1038 | 3615 | | | |
| 42 | | Club Annie Fuentes | Annie Fuentes | Club |
| 8891 | 5952 | | | |
| 43 | | Club Maria Sawyer | Maria Sawyer | Club |
| 1290 | 4033 | | | |
| 44 | | Club Darnell Straughter | Darnell Straughter | Club |
| 431 | 6231 | | | |
| 45 | | Hotel Richard Breaux | Richard Breaux | Hotel |
| 8156 | 1245 | | | |
| 46 | | Hotel Craig Collins | Craig Collins | Hotel |
| 299 | 657 | | | |
| 47 | | Hotel Donna Lam | Donna Lam | Hotel |
| 1323 | 4963 | | | |
| 48 | | Hotel Teresa Vasbinder | Teresa Vasbinder | Hotel |
| 8466 | 4079 | | | |
| 49 | | Hotel Andre Mobley | Andre Mobley | Hotel |
| 870 | 2428 | | | |
| 50 | | Hotel Ray Hernandez | Ray Hernandez | Hotel |
| 1497 | 1768 | | | |
| 51 | | Hotel Thomas Stewart | Thomas Stewart | Hotel |

| | | | | |
|------|------|-----------------------|-----------------|-------|
| 1082 | 3353 | | | |
| 52 | | Hotel Henry Lange | Henry Lange | Hotel |
| 9791 | 9610 | | | |
| 53 | | Hotel Danielle Tomas | Danielle Tomas | Hotel |
| 1357 | 4189 | | | |
| 54 | | Hotel Joe Schimke | Joe Schimke | Hotel |
| 576 | 2628 | | | |
| 55 | | Hotel Carlos Jackson | Carlos Jackson | Hotel |
| 128 | 416 | | | |
| 56 | | Hotel Russell Wallace | Russell Wallace | Hotel |
| 8034 | 6541 | | | |
| 57 | | Hotel Shameka West | Shameka West | Hotel |
| 1263 | 2517 | | | |
| 58 | | Hotel Kevin Fleming | Kevin Fleming | Hotel |
| 1032 | 3919 | | | |
| 59 | | Hotel Anna Grey | Anna Grey | Hotel |
| 1014 | 2254 | | | |

| | | | |
|----|------|------|------|
| | 2019 | 2020 | 2021 |
| 0 | 7063 | 7208 | 9093 |
| 1 | 4121 | 6210 | 6909 |
| 2 | 1634 | 4302 | 9768 |
| 3 | 2897 | 4499 | 9428 |
| 4 | 2722 | 4410 | 5873 |
| 5 | 7777 | 7891 | 8758 |
| 6 | 991 | 448 | 211 |
| 7 | 6582 | 9024 | 9759 |
| 8 | 5556 | 5202 | 2373 |
| 9 | 2027 | 4881 | 6002 |
| 10 | 5188 | 3436 | 2359 |
| 11 | 4068 | 4278 | 5382 |
| 12 | 3548 | 3668 | 8592 |
| 13 | 1810 | 6510 | 9271 |
| 14 | 4776 | 4024 | 369 |
| 15 | 7438 | 7443 | 9225 |
| 16 | 5072 | 5201 | 7588 |
| 17 | 6247 | 8495 | 9236 |
| 18 | 8390 | 8256 | 3815 |
| 19 | 4592 | 5143 | 8100 |
| 20 | 1822 | 7074 | 8207 |
| 21 | 4535 | 5476 | 9983 |
| 22 | 5952 | 1998 | 375 |
| 23 | 2844 | 6877 | 9570 |
| 24 | 7279 | 8443 | 9571 |
| 25 | 5791 | 1759 | 969 |
| 26 | 3098 | 7118 | 8433 |
| 27 | 5123 | 4968 | 3857 |
| 28 | 6087 | 7494 | 8599 |
| 29 | 3461 | 3850 | 4657 |
| 30 | 5190 | 8203 | 8780 |

| | | | |
|----|------|------|------|
| 31 | 6750 | 8254 | 8656 |
| 32 | 7883 | 7499 | 6592 |
| 33 | 4928 | 8451 | 9585 |
| 34 | 4123 | 4366 | 9482 |
| 35 | 3984 | 8803 | 9338 |
| 36 | 4423 | 8733 | 9909 |
| 37 | 3898 | 1857 | 1512 |
| 38 | 5775 | 7661 | 9206 |
| 39 | 4373 | 6803 | 7578 |
| 40 | 4259 | 4243 | 907 |
| 41 | 3712 | 5819 | 9589 |
| 42 | 5914 | 5405 | 4031 |
| 43 | 6956 | 7929 | 8834 |
| 44 | 7478 | 8039 | 8271 |
| 45 | 791 | 338 | 44 |
| 46 | 6238 | 8922 | 9081 |
| 47 | 6292 | 6728 | 8202 |
| 48 | 2797 | 2245 | 1696 |
| 49 | 7386 | 8835 | 9766 |
| 50 | 2804 | 5718 | 9822 |
| 51 | 6351 | 8550 | 9272 |
| 52 | 7534 | 5080 | 4936 |
| 53 | 5407 | 6233 | 9681 |
| 54 | 3612 | 5066 | 5156 |
| 55 | 747 | 1028 | 6357 |
| 56 | 3311 | 3254 | 2687 |
| 57 | 8042 | 8222 | 9686 |
| 58 | 4466 | 5568 | 6476 |
| 59 | 4534 | 6796 | 7730 |

```
DfSumSaleYear1 = DfSumSaleYear.drop(['Decision Maker'], axis = 1)
```

```
DfSumSaleYear1
```

| | Business Name | Account Type | 2017 | 2018 | 2019 | 2020 |
|------|----------------------|--------------|------|------|------|------|
| 2021 | | | | | | |
| 0 | Bar Dorothy Rizzo | Bar | 1982 | 5388 | 7063 | 7208 |
| 9093 | | | | | | |
| 1 | Bar Lawson Moore | Bar | 2786 | 3804 | 4121 | 6210 |
| 6909 | | | | | | |
| 2 | Bar Vin Hudson | Bar | 1209 | 1534 | 1634 | 4302 |
| 9768 | | | | | | |
| 3 | Bar Susana Huels | Bar | 906 | 1251 | 2897 | 4499 |
| 9428 | | | | | | |
| 4 | Bar Shanna Hettinger | Bar | 1421 | 1893 | 2722 | 4410 |
| 5873 | | | | | | |
| 5 | Bar Roy McGlynn | Bar | 2341 | 6105 | 7777 | 7891 |
| 8758 | | | | | | |
| 6 | Bar Lorena Posacco | Bar | 9252 | 8499 | 991 | 448 |
| 211 | | | | | | |
| 7 | Bar Juanita Wisozk | Bar | 1581 | 4799 | 6582 | 9024 |

| | | | | | | |
|------|------------------------------|------------|------|------|------|------|
| 9759 | | | | | | |
| 8 | Bar Velma Riley | Bar | 9766 | 8049 | 5556 | 5202 |
| 2373 | | | | | | |
| 9 | Bar Holly Gaines | Bar | 1530 | 1620 | 2027 | 4881 |
| 6002 | | | | | | |
| 10 | Bar Gary Brown | Bar | 7555 | 6551 | 5188 | 3436 |
| 2359 | | | | | | |
| 11 | Bar Jeffrey Akins | Bar | 1532 | 2678 | 4068 | 4278 |
| 5382 | | | | | | |
| 12 | Bar Tim Young | Bar | 24 | 1797 | 3548 | 3668 |
| 8592 | | | | | | |
| 13 | Bar Debra Kroll | Bar | 861 | 1314 | 1810 | 6510 |
| 9271 | | | | | | |
| 14 | Bar Kelly Boyd | Bar | 9058 | 4839 | 4776 | 4024 |
| 369 | | | | | | |
| 15 | Restaurant Dan Hill | Restaurant | 3501 | 7079 | 7438 | 7443 |
| 9225 | | | | | | |
| 16 | Restaurant Javier George | Restaurant | 3916 | 4218 | 5072 | 5201 |
| 7588 | | | | | | |
| 17 | Restaurant Christopher Evans | Restaurant | 700 | 5721 | 6247 | 8495 |
| 9236 | | | | | | |
| 18 | Restaurant Julie Ross | Restaurant | 9773 | 9179 | 8390 | 8256 |
| 3815 | | | | | | |
| 19 | Restaurant Bill Callahan | Restaurant | 73 | 3485 | 4592 | 5143 |
| 8100 | | | | | | |
| 20 | Restaurant Anthony Brooks | Restaurant | 238 | 1235 | 1822 | 7074 |
| 8207 | | | | | | |
| 21 | Restaurant Charlotte Leroux | Restaurant | 1368 | 3447 | 4535 | 5476 |
| 9983 | | | | | | |
| 22 | Restaurant Nina Coulter | Restaurant | 8331 | 7667 | 5952 | 1998 |
| 375 | | | | | | |
| 23 | Restaurant Mia Ang | Restaurant | 1779 | 2124 | 2844 | 6877 |
| 9570 | | | | | | |
| 24 | Restaurant Kathy Rogers | Restaurant | 570 | 1322 | 7279 | 8443 |
| 9571 | | | | | | |
| 25 | Restaurant Rita Varga | Restaurant | 6156 | 6110 | 5791 | 1759 |
| 969 | | | | | | |
| 26 | Restaurant Mel Berkowitz | Restaurant | 209 | 621 | 3098 | 7118 |
| 8433 | | | | | | |
| 27 | Restaurant Debra Martin | Restaurant | 6309 | 6227 | 5123 | 4968 |
| 3857 | | | | | | |
| 28 | Restaurant Deshaun Fletcher | Restaurant | 712 | 4182 | 6087 | 7494 |
| 8599 | | | | | | |
| 29 | Restaurant Kari Lenz | Restaurant | 2390 | 2415 | 3461 | 3850 |
| 4657 | | | | | | |
| 30 | Club John Mackey | Club | 2519 | 3938 | 5190 | 8203 |
| 8780 | | | | | | |
| 31 | Club Raymond Heywin | Club | 138 | 286 | 6750 | 8254 |
| 8656 | | | | | | |
| 32 | Club Janie Roberson | Club | 8873 | 8484 | 7883 | 7499 |

| | | | | | | |
|------|-------------------------|-------|------|------|------|------|
| 6592 | | | | | | |
| 33 | Club Brooke Hayes | Club | 3297 | 4866 | 4928 | 8451 |
| 9585 | | | | | | |
| 34 | Club Lee Niemeyer | Club | 1092 | 3140 | 4123 | 4366 |
| 9482 | | | | | | |
| 35 | Club Stephen Harris | Club | 2541 | 3794 | 3984 | 8803 |
| 9338 | | | | | | |
| 36 | Club Juan Scott | Club | 742 | 3751 | 4423 | 8733 |
| 9909 | | | | | | |
| 37 | Club Kurt Issacs | Club | 7703 | 6957 | 3898 | 1857 |
| 1512 | | | | | | |
| 38 | Club Dominique Johnson | Club | 488 | 5535 | 5775 | 7661 |
| 9206 | | | | | | |
| 39 | Club Larry Alaimo | Club | 376 | 889 | 4373 | 6803 |
| 7578 | | | | | | |
| 40 | Club Carlos Moya | Club | 7840 | 5804 | 4259 | 4243 |
| 907 | | | | | | |
| 41 | Club Shaun Salvatore | Club | 1038 | 3615 | 3712 | 5819 |
| 9589 | | | | | | |
| 42 | Club Annie Fuentes | Club | 8891 | 5952 | 5914 | 5405 |
| 4031 | | | | | | |
| 43 | Club Maria Sawyer | Club | 1290 | 4033 | 6956 | 7929 |
| 8834 | | | | | | |
| 44 | Club Darnell Straughter | Club | 431 | 6231 | 7478 | 8039 |
| 8271 | | | | | | |
| 45 | Hotel Richard Breaux | Hotel | 8156 | 1245 | 791 | 338 |
| 44 | | | | | | |
| 46 | Hotel Craig Collins | Hotel | 299 | 657 | 6238 | 8922 |
| 9081 | | | | | | |
| 47 | Hotel Donna Lam | Hotel | 1323 | 4963 | 6292 | 6728 |
| 8202 | | | | | | |
| 48 | Hotel Teresa Vasbinder | Hotel | 8466 | 4079 | 2797 | 2245 |
| 1696 | | | | | | |
| 49 | Hotel Andre Mobley | Hotel | 870 | 2428 | 7386 | 8835 |
| 9766 | | | | | | |
| 50 | Hotel Ray Hernandez | Hotel | 1497 | 1768 | 2804 | 5718 |
| 9822 | | | | | | |
| 51 | Hotel Thomas Stewart | Hotel | 1082 | 3353 | 6351 | 8550 |
| 9272 | | | | | | |
| 52 | Hotel Henry Lange | Hotel | 9791 | 9610 | 7534 | 5080 |
| 4936 | | | | | | |
| 53 | Hotel Danielle Tomas | Hotel | 1357 | 4189 | 5407 | 6233 |
| 9681 | | | | | | |
| 54 | Hotel Joe Schimke | Hotel | 576 | 2628 | 3612 | 5066 |
| 5156 | | | | | | |
| 55 | Hotel Carlos Jackson | Hotel | 128 | 416 | 747 | 1028 |
| 6357 | | | | | | |
| 56 | Hotel Russell Wallace | Hotel | 8034 | 6541 | 3311 | 3254 |
| 2687 | | | | | | |
| 57 | Hotel Shameka West | Hotel | 1263 | 2517 | 8042 | 8222 |

```

9686
58          Hotel Kevin Fleming          Hotel  1032  3919  4466  5568
6476
59          Hotel Anna Grey             Hotel  1014  2254  4534  6796
7730

```

```
DfSumSaleYear2 = DfSumSaleYear1.set_index('Business Name')
```

```

DfSumSaleYear2.loc['TotalSales/Year']=
DfSumSaleYear2.sum(numeric_only=True, axis=0)
DfSumSaleYear2.loc[:, 'TotalSales/Customer/AllYears'] =
DfSumSaleYear2.sum(numeric_only=True, axis=1)

```

```
DfSumSaleYear2
```

| | Account Type | 2017 | 2018 | 2019 |
|-----------------------|--------------|----------|----------|----------|
| 2020 \ Business Name | | | | |
| Bar Dorothy Rizzo | Bar | 1982.0 | 5388.0 | 7063.0 |
| 7208.0 | | | | |
| Bar Lawson Moore | Bar | 2786.0 | 3804.0 | 4121.0 |
| 6210.0 | | | | |
| Bar Vin Hudson | Bar | 1209.0 | 1534.0 | 1634.0 |
| 4302.0 | | | | |
| Bar Susana Huel | Bar | 906.0 | 1251.0 | 2897.0 |
| 4499.0 | | | | |
| Bar Shanna Hettinger | Bar | 1421.0 | 1893.0 | 2722.0 |
| 4410.0 | | | | |
| ... | ... | ... | ... | ... |
| ... | | | | |
| Hotel Russell Wallace | Hotel | 8034.0 | 6541.0 | 3311.0 |
| 3254.0 | | | | |
| Hotel Shameka West | Hotel | 1263.0 | 2517.0 | 8042.0 |
| 8222.0 | | | | |
| Hotel Kevin Fleming | Hotel | 1032.0 | 3919.0 | 4466.0 |
| 5568.0 | | | | |
| Hotel Anna Grey | Hotel | 1014.0 | 2254.0 | 4534.0 |
| 6796.0 | | | | |
| TotalSales/Year | NaN | 189976.0 | 242995.0 | 288449.0 |
| 350234.0 | | | | |

| | 2021 | TotalSales/Customer/AllYears |
|-----------------------|--------|------------------------------|
| Business Name | | |
| Bar Dorothy Rizzo | 9093.0 | 30734.0 |
| Bar Lawson Moore | 6909.0 | 23830.0 |
| Bar Vin Hudson | 9768.0 | 18447.0 |
| Bar Susana Huel | 9428.0 | 18981.0 |
| Bar Shanna Hettinger | 5873.0 | 16319.0 |
| ... | ... | ... |
| Hotel Russell Wallace | 2687.0 | 23827.0 |

| | | |
|---------------------|----------|-----------|
| Hotel Shameka West | 9686.0 | 29730.0 |
| Hotel Kevin Fleming | 6476.0 | 21461.0 |
| Hotel Anna Grey | 7730.0 | 22328.0 |
| TotalSales/Year | 409194.0 | 1480848.0 |

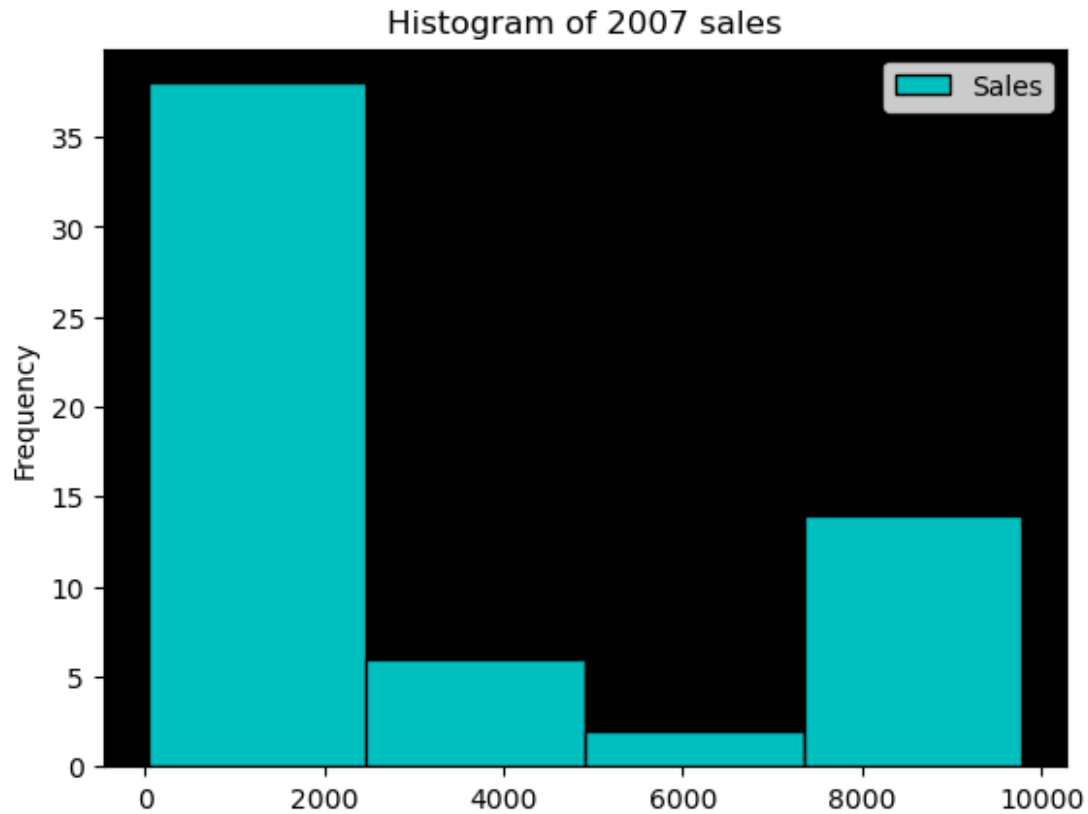
[61 rows x 7 columns]

```
box_plot_data = DfSumSaleYear2[[2017,2018,2019,2020, 2021]][0:60]
ax = box_plot_data.plot(kind='box', vert=False);
ax.set_facecolor("yellow")
plt.show()
```

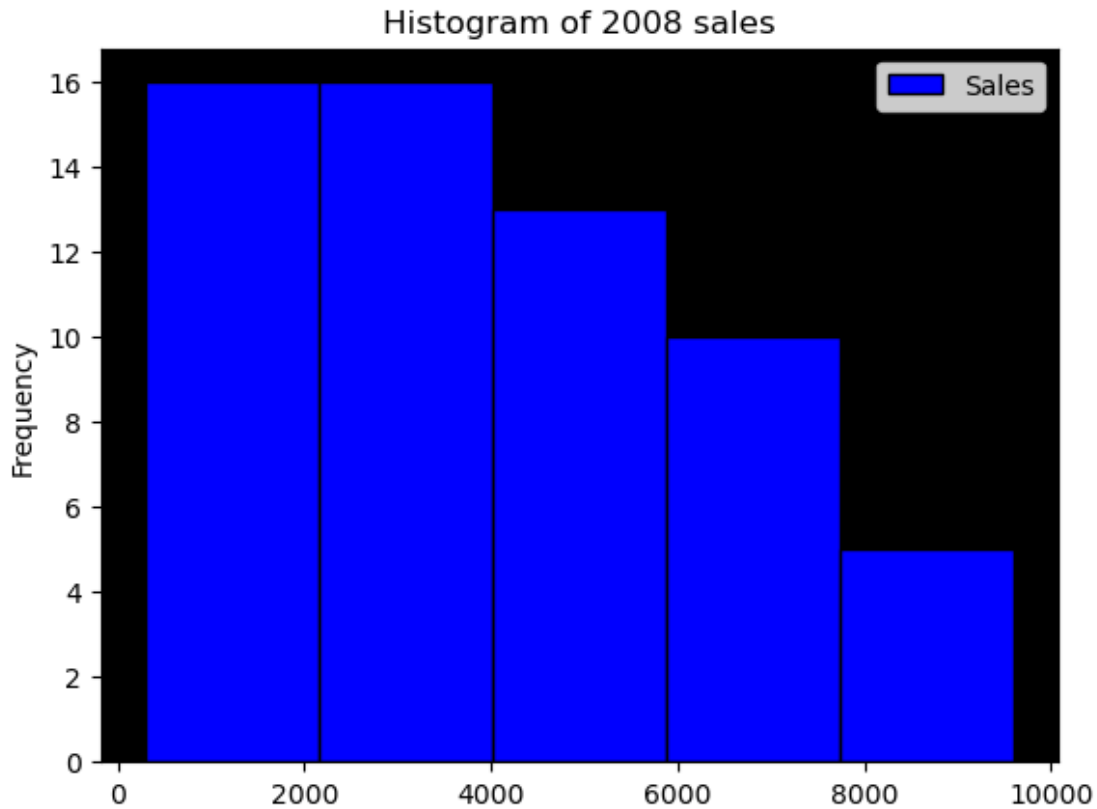
```
DfSumSaleYear2[[2017,2018,2019,2020, 2021]][0:60].describe()
```

| | 2017 | 2018 | 2019 | 2020 | 2021 |
|-------|-------------|-------------|-------------|-------------|-------------|
| count | 60.000000 | 60.000000 | 60.000000 | 60.000000 | 60.000000 |
| mean | 3166.266667 | 4049.916667 | 4807.483333 | 5837.233333 | 6819.900000 |
| std | 3314.536544 | 2391.066235 | 1959.524730 | 2314.301032 | 3158.238378 |
| min | 24.000000 | 286.000000 | 747.000000 | 338.000000 | 44.000000 |
| 25% | 831.250000 | 2066.250000 | 3526.250000 | 4350.000000 | 4866.250000 |
| 50% | 1459.000000 | 3861.500000 | 4684.000000 | 6014.500000 | 8239.000000 |
| 75% | 6194.250000 | 5841.000000 | 6258.250000 | 7900.500000 | 9288.500000 |
| max | 9791.000000 | 9610.000000 | 8390.000000 | 9024.000000 | 9983.000000 |

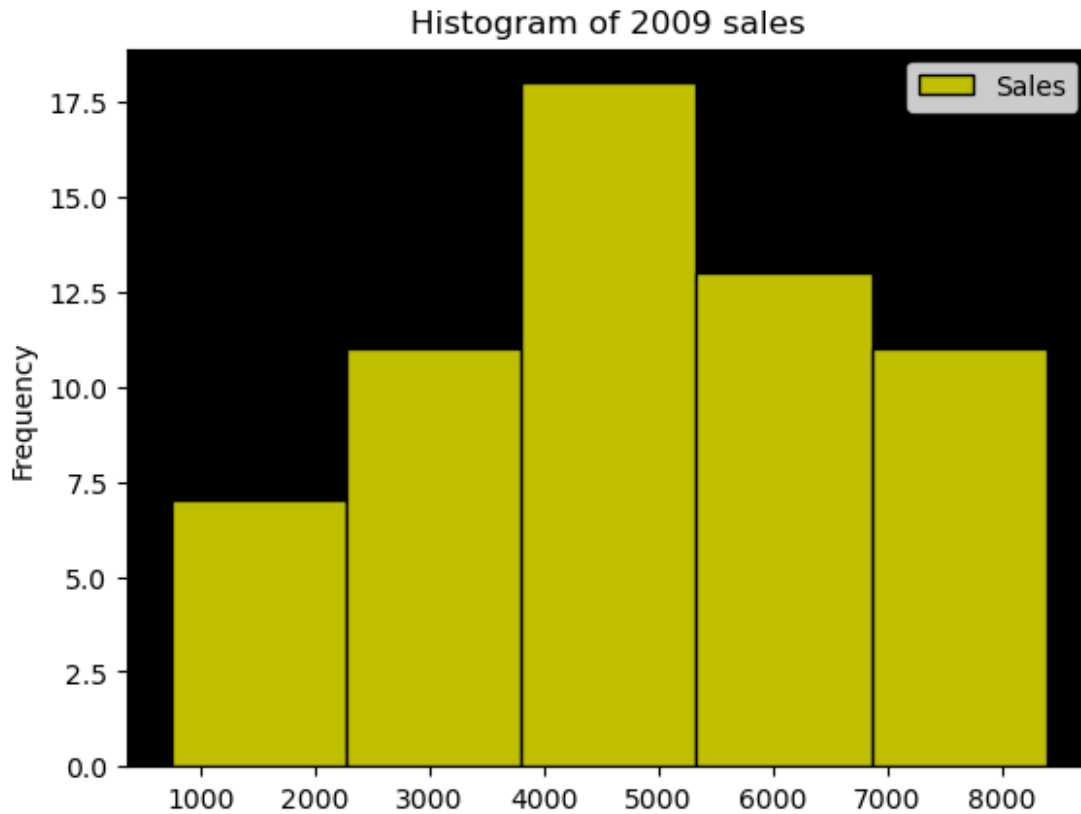
```
box_plot_data = DfSumSaleYear2[2017][0:60]
#DfSumSaleYear2[2017][0:60](normalize=True)
ax = box_plot_data.plot(kind='hist',bins=4,
histtype='bar',align='mid', color='c',
label='Sales',edgecolor='black')
#ax = box_plot_data.plot(kind='box', vert=False);
ax.set_facecolor("black")
plt.legend()
plt.title('Histogram of 2007 sales')
plt.show()
```



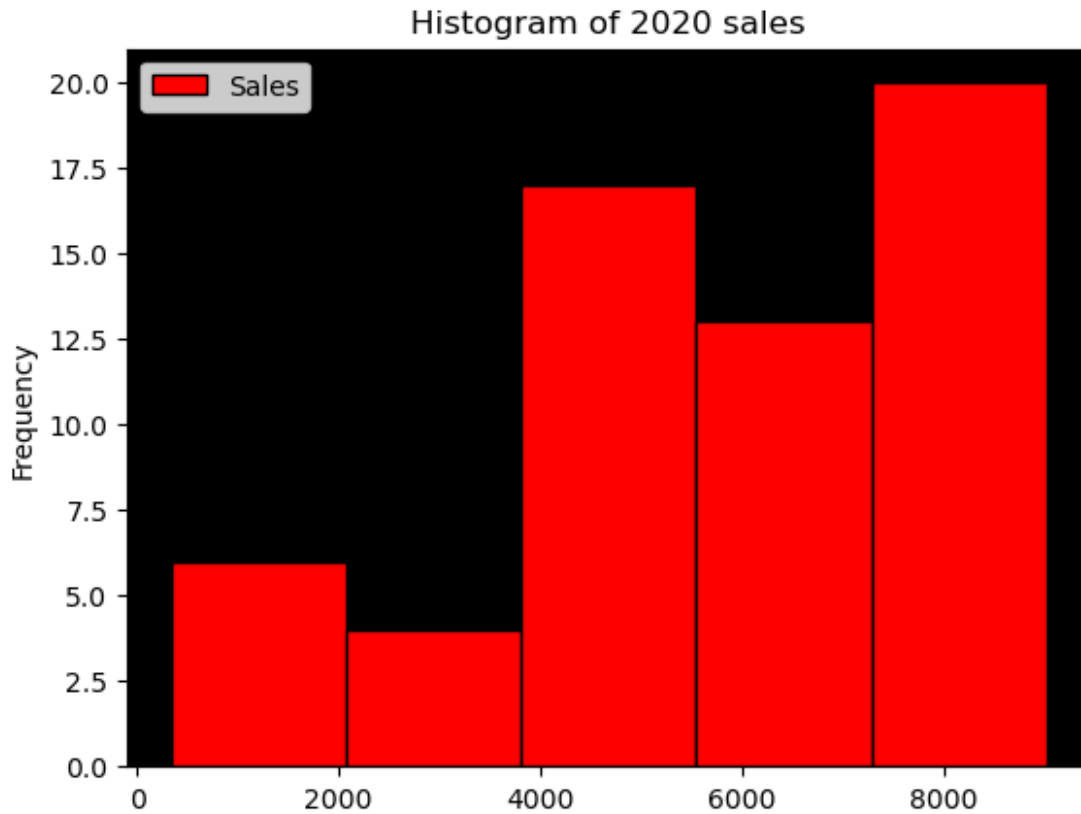
```
box_plot_data = DfSumSaleYear2[2018][0:60]
#DfSumSaleYear2[2017][0:60](normalize=True)
ax = box_plot_data.plot(kind='hist',bins=5,
histtype='bar',align='mid', color='b',
label='Sales',edgecolor='black')
#ax = box_plot_data.plot(kind='box', vert=False);
ax.set_facecolor("black")
plt.legend()
plt.title('Histogram of 2008 sales')
plt.show()
```



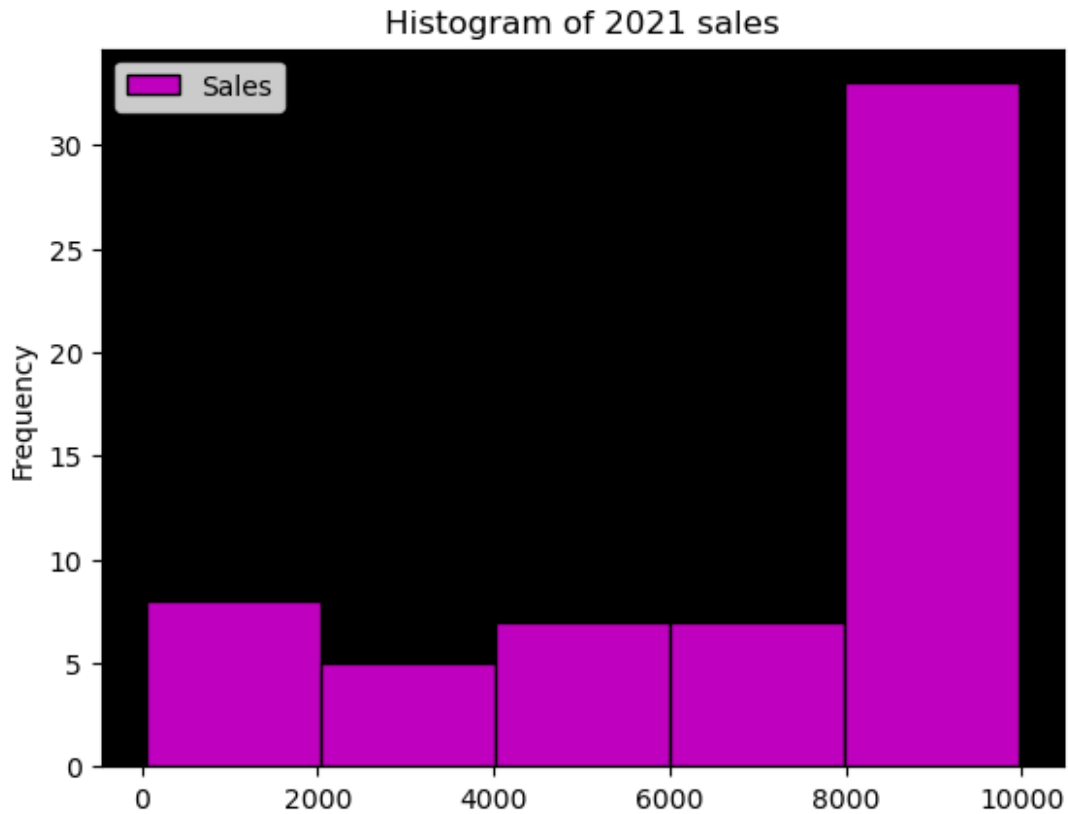
```
box_plot_data = DfSumSaleYear2[2019][0:60]
#DfSumSaleYear2[2017][0:60](normalize=True)
ax = box_plot_data.plot(kind='hist',bins=5,
histtype='bar',align='mid', color='y',
label='Sales',edgecolor='black')
#ax = box_plot_data.plot(kind='box', vert=False);
ax.set_facecolor("black")
plt.legend()
plt.title('Histogram of 2009 sales')
plt.show()
```



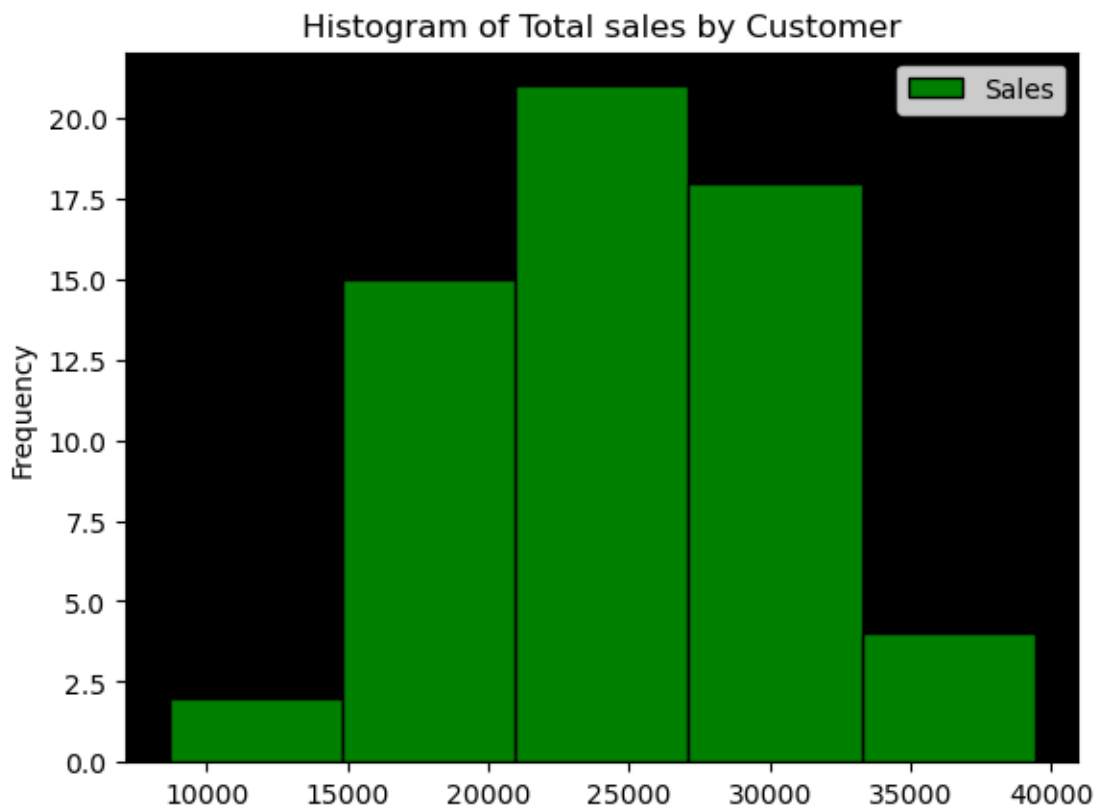
```
box_plot_data = DfSumSaleYear2[2020][0:60]
#DfSumSaleYear2[2017][0:60](normalize=True)
ax = box_plot_data.plot(kind='hist',bins=5,
histtype='bar',align='mid', color='r',
label='Sales',edgecolor='black')
#ax = box_plot_data.plot(kind='box', vert=False);
ax.set_facecolor("black")
plt.legend()
plt.title('Histogram of 2020 sales')
plt.show()
```

```
box_plot_data = DfSumSaleYear2[2021][0:60]
#DfSumSaleYear2[2017][0:60](normalize=True)
ax = box_plot_data.plot(kind='hist',bins=5,
histtype='bar',align='mid', color='m',
label='Sales',edgecolor='black')
#ax = box_plot_data.plot(kind='box', vert=False);
ax.set_facecolor("black")
plt.legend()
plt.title('Histogram of 2021 sales')
plt.show()
```



```
box_plot_data = DfSumSaleYear2['TotalSales/Customer/AllYears'][0:60]
#DfSumSaleYear2[2017][0:60](normalize=True)
ax = box_plot_data.plot(kind='hist',bins=5,
histtype='bar',align='mid', color='g',
label='Sales',edgecolor='black')
#ax = box_plot_data.plot(kind='box', vert=False);
ax.set_facecolor("black")
plt.legend()
plt.title('Histogram of Total sales by Customer')
plt.show()
```



```
dfno = df2[(~df2["Cooler?"].str.contains("Yes")) & (~df2["Digital
screen?"].str.contains("Yes"))& (~df2["Menu
inclusion?"].str.contains("Yes"))&
(~df2["Posters?"].str.contains("Yes"))]
dfno
```

| | Street | City | State | Zipcode | Decision |
|----|-------------------------|---------------|-------|---------|----------|
| 10 | 44 W. Pheasant Street | Brooklyn | NY | 11233 | Gary |
| 11 | 7488 N. Marconi Ave | Brooklyn | NY | 11237 | Jeffrey |
| 14 | 44 Madison Dr | New York | NY | 10032 | Kelly |
| 15 | 9848 Linden St | New York | NY | 10011 | Dan |
| 16 | 805 South Pilgrim Court | Brooklyn | NY | 11225 | Javier |
| 18 | 3 Warren Drive | New York | NY | 10040 | Julie |
| 27 | 62 Lower River Road | Staten Island | NY | 10306 | Debra |
| 29 | 5 Tallwood St | Brooklyn | NY | 11233 | Kari |

| | | | | | | |
|---------|------------------|---------------|----|-------|---------|--|
| Lenz | | | | | | |
| 42 | 424 Hall Ave | New York | NY | 10128 | Annie | |
| Fuentes | | | | | | |
| 56 | 8083 8th St | Brooklyn | NY | 11209 | Russell | |
| Wallace | | | | | | |
| 57 | 2 Rock Maple Ave | New York | NY | 10029 | Shameka | |
| West | | | | | | |
| 58 | 9577 Nicolls Ave | Staten Island | NY | 10312 | Kevin | |
| Fleming | | | | | | |
| 59 | 174 Del Monte St | Brooklyn | NY | 11224 | Anna | |
| Grey | | | | | | |

| | Phone Number | Account Type | Regular | Sugar Free | Yellow Edition |
|----|----------------|--------------|---------|------------|----------------|
| 10 | (459) 968-9453 | Bar | Yes | No | No |
| 11 | (313) 417-8968 | Bar | Yes | No | No |
| 14 | (220) 929-0797 | Bar | Yes | Yes | No |
| 15 | (248) 450-0797 | Restaurant | Yes | Yes | No |
| 16 | (964) 214-3742 | Restaurant | Yes | Yes | No |
| 18 | (778) 387-0744 | Restaurant | Yes | Yes | No |
| 27 | (743) 960-6716 | Restaurant | Yes | Yes | No |
| 29 | (886) 554-5339 | Restaurant | Yes | Yes | No |
| 42 | (462) 693-6254 | Club | Yes | Yes | No |
| 56 | (237) 890-0247 | Hotel | Yes | No | No |
| 57 | (488) 656-0761 | Hotel | Yes | Yes | Yes |
| 58 | (650) 848-8284 | Hotel | Yes | Yes | Yes |
| 59 | (980) 437-1451 | Hotel | Yes | Yes | Yes |

| | Digital screen? | Menu inclusion? | Posters? | 2017 | 2018 | 2019 | 2020 |
|----|-----------------|-----------------|----------|------|------|------|------|
| 10 | No | No | No | 7555 | 6551 | 5188 | 3436 |
| 11 | No | No | No | 1532 | 2678 | 4068 | 4278 |
| 14 | No | No | No | 9058 | 4839 | 4776 | 4024 |
| 15 | No | No | No | 3501 | 7079 | 7438 | 7443 |

| | | | | | | | |
|------|----|----|----|------|------|------|------|
| 9225 | | | | | | | |
| 16 | No | No | No | 3916 | 4218 | 5072 | 5201 |
| 7588 | | | | | | | |
| 18 | No | No | No | 9773 | 9179 | 8390 | 8256 |
| 3815 | | | | | | | |
| 27 | No | No | No | 6309 | 6227 | 5123 | 4968 |
| 3857 | | | | | | | |
| 29 | No | No | No | 2390 | 2415 | 3461 | 3850 |
| 4657 | | | | | | | |
| 42 | No | No | No | 8891 | 5952 | 5914 | 5405 |
| 4031 | | | | | | | |
| 56 | No | No | No | 8034 | 6541 | 3311 | 3254 |
| 2687 | | | | | | | |
| 57 | No | No | No | 1263 | 2517 | 8042 | 8222 |
| 9686 | | | | | | | |
| 58 | No | No | No | 1032 | 3919 | 4466 | 5568 |
| 6476 | | | | | | | |
| 59 | No | No | No | 1014 | 2254 | 4534 | 6796 |
| 7730 | | | | | | | |

```
dfyes = df2[(df2["Cooler?"].str.contains("Yes")) & (df2["Digital
screen?"].str.contains("Yes"))& (df2["Menu
inclusion?"].str.contains("Yes"))&
(df2["Posters?"].str.contains("Yes"))]
dfyes
```

| | Street | City | State | Zipcode | Decision |
|-----------|-----------------------|---------------|-------|---------|-----------|
| Maker \ | | | | | |
| 0 | 2131 Patterson Road | Brooklyn | NY | 11201 | Dorothy |
| Rizzo | | | | | |
| 2 | 2285 Ladybug Drive | New York | NY | 10013 | Vin |
| Hudson | | | | | |
| 3 | 2930 Southern Street | New York | NY | 10005 | Susana |
| Huels | | | | | |
| 4 | 2807 Geraldine Lane | New York | NY | 10004 | Shanna |
| Hettinger | | | | | |
| 12 | 9575 Shipley Court | Brooklyn | NY | 11201 | Tim |
| Young | | | | | |
| 13 | 8156 Lake View Street | New York | NY | 10025 | Debra |
| Kroll | | | | | |
| 34 | 7839 Elm St | Staten Island | NY | 10306 | Lee |
| Niemeyer | | | | | |
| 36 | 640 Beechwood Dr | Bronx | NY | 10461 | Juan |
| Scott | | | | | |
| 38 | 81 San Carlos Road | Bronx | NY | 10463 | Dominique |
| Johnson | | | | | |
| 39 | 596 Coffee St | Bronx | NY | 10472 | Larry |
| Alaimo | | | | | |
| 41 | 9151 River St | Brooklyn | NY | 11230 | Shaun |
| Salvatore | | | | | |

| | Phone Number | Account Type | Regular | Sugar Free | Yellow Edition |
|-----------|----------------|--------------|---------|------------|----------------|
| Cooler? \ | | | | | |
| 0 | (880) 283-6803 | Bar | Yes | Yes | Yes |
| Yes | | | | | |
| 2 | (952) 952-5573 | Bar | Yes | Yes | Yes |
| Yes | | | | | |
| 3 | (491) 505-6064 | Bar | Yes | Yes | Yes |
| Yes | | | | | |
| 4 | (412) 570-0596 | Bar | Yes | Yes | No |
| Yes | | | | | |
| 12 | (876) 653-1727 | Bar | Yes | Yes | Yes |
| Yes | | | | | |
| 13 | (628) 832-4986 | Bar | Yes | Yes | Yes |
| Yes | | | | | |
| 34 | (920) 451-3973 | Club | Yes | Yes | Yes |
| Yes | | | | | |
| 36 | (357) 532-0838 | Club | Yes | Yes | Yes |
| Yes | | | | | |
| 38 | (336) 448-7026 | Club | Yes | Yes | Yes |
| Yes | | | | | |
| 39 | (242) 869-1226 | Club | Yes | Yes | Yes |
| Yes | | | | | |
| 41 | (691) 657-1498 | Club | Yes | Yes | Yes |
| Yes | | | | | |

| | Digital screen? | Menu inclusion? | Posters? | 2017 | 2018 | 2019 | 2020 |
|------|-----------------|-----------------|----------|------|------|------|------|
| 2021 | | | | | | | |
| 0 | Yes | Yes | Yes | 1982 | 5388 | 7063 | 7208 |
| 9093 | | | | | | | |
| 2 | Yes | Yes | Yes | 1209 | 1534 | 1634 | 4302 |
| 9768 | | | | | | | |
| 3 | Yes | Yes | Yes | 906 | 1251 | 2897 | 4499 |
| 9428 | | | | | | | |
| 4 | Yes | Yes | Yes | 1421 | 1893 | 2722 | 4410 |
| 5873 | | | | | | | |
| 12 | Yes | Yes | Yes | 24 | 1797 | 3548 | 3668 |
| 8592 | | | | | | | |
| 13 | Yes | Yes | Yes | 861 | 1314 | 1810 | 6510 |
| 9271 | | | | | | | |
| 34 | Yes | Yes | Yes | 1092 | 3140 | 4123 | 4366 |
| 9482 | | | | | | | |
| 36 | Yes | Yes | Yes | 742 | 3751 | 4423 | 8733 |
| 9909 | | | | | | | |
| 38 | Yes | Yes | Yes | 488 | 5535 | 5775 | 7661 |
| 9206 | | | | | | | |
| 39 | Yes | Yes | Yes | 376 | 889 | 4373 | 6803 |
| 7578 | | | | | | | |
| 41 | Yes | Yes | Yes | 1038 | 3615 | 3712 | 5819 |
| 9589 | | | | | | | |

```
dfnonoyes = df2[(~df2["Cooler?"].str.contains("Yes")) & (~df2["Digital
screen?"].str.contains("Yes"))& (~df2["Menu
inclusion?"].str.contains("Yes"))&
(df2["Posters?"].str.contains("Yes"))]
dfnonoyes
```

Empty DataFrame

```
Columns: [Street, City, State, Zipcode, Decision Maker, Phone Number,
Account Type, Regular, Sugar Free, Yellow Edition, Cooler?, Digital
screen?, Menu inclusion?, Posters?, 2017, 2018, 2019, 2020, 2021]
Index: []
```

```
dfnoyesyes = df2[(~df2["Cooler?"].str.contains("Yes")) &
(~df2["Digital screen?"].str.contains("Yes"))& (df2["Menu
inclusion?"].str.contains("Yes"))&
(df2["Posters?"].str.contains("Yes"))]
dfnoyesyes
```

| | Street | City | State | Zipcode | Decision Maker \ |
|----|--------------------|----------|-------|---------|------------------|
| 32 | 7223 Cedarwood Ave | Brooklyn | NY | 11221 | Janie Roberson |
| 33 | 62 Lafayette Ave | Bronx | NY | 10462 | Brooke Hayes |
| 35 | 429 Stonybrook Dr | Brooklyn | NY | 11203 | Stephen Harris |
| 37 | 9453 N. Wagon Lane | Brooklyn | NY | 11237 | Kurt Issacs |
| 40 | 92 Princess St | New York | NY | 10033 | Carlos Moya |

| | Phone Number | Account | Type | Regular | Sugar | Free | Yellow | Edition |
|-----------|----------------|---------|------|---------|-------|------|--------|---------|
| Cooler? \ | | | | | | | | |
| 32 | (924) 516-6566 | | Club | Yes | | Yes | | Yes |
| No | | | | | | | | |
| 33 | (247) 999-3394 | | Club | Yes | | Yes | | Yes |
| No | | | | | | | | |
| 35 | (258) 948-7479 | | Club | Yes | | Yes | | Yes |
| No | | | | | | | | |
| 37 | (454) 903-5770 | | Club | Yes | | No | | No |
| No | | | | | | | | |
| 40 | (485) 453-8693 | | Club | Yes | | No | | No |
| No | | | | | | | | |

| | Digital screen? | Menu inclusion? | Posters? | 2017 | 2018 | 2019 | 2020 |
|------|-----------------|-----------------|----------|------|------|------|------|
| 2021 | | | | | | | |
| 32 | No | Yes | Yes | 8873 | 8484 | 7883 | 7499 |
| 6592 | | | | | | | |
| 33 | No | Yes | Yes | 3297 | 4866 | 4928 | 8451 |
| 9585 | | | | | | | |
| 35 | No | Yes | Yes | 2541 | 3794 | 3984 | 8803 |
| 9338 | | | | | | | |
| 37 | No | Yes | Yes | 7703 | 6957 | 3898 | 1857 |
| 1512 | | | | | | | |

| | | | | | | | |
|-----|----|-----|-----|------|------|------|------|
| 40 | No | Yes | Yes | 7840 | 5804 | 4259 | 4243 |
| 907 | | | | | | | |

```
dfnoyesyesyes = df2[(~df2["Cooler?"].str.contains("Yes")) &
(df2["Digital screen?"].str.contains("Yes"))& (df2["Menu
inclusion?"].str.contains("Yes"))&
(df2["Posters?"].str.contains("Yes"))]
dfnoyesyesyes
```

| | Street | City | State | Zipcode | Decision Maker | \ |
|---|-----------------------|----------|-------|---------|----------------|---|
| 1 | 3685 Morningview Lane | New York | NY | 10013 | Lawson Moore | |

| | Phone Number | Account Type | Regular | Sugar Free | Yellow Edition |
|-----------|----------------|--------------|---------|------------|----------------|
| Cooler? \ | | | | | |
| 1 | (711) 426-7350 | Bar | Yes | Yes | Yes |
| No | | | | | |

| | Digital screen? | Menu inclusion? | Posters? | 2017 | 2018 | 2019 | 2020 |
|------|-----------------|-----------------|----------|------|------|------|------|
| 2021 | | | | | | | |
| 1 | Yes | Yes | Yes | 2786 | 3804 | 4121 | 6210 |
| 6909 | | | | | | | |

```
dfyesnonono = df2[(df2["Cooler?"].str.contains("Yes")) & (df2["Digital
screen?"].str.contains("No"))& (df2["Menu
inclusion?"].str.contains("NO"))&
(df2["Posters?"].str.contains("No"))]
dfyesnonono
```

Empty DataFrame

Columns: [Street, City, State, Zipcode, Decision Maker, Phone Number, Account Type, Regular, Sugar Free, Yellow Edition, Cooler?, Digital screen?, Menu inclusion?, Posters?, 2017, 2018, 2019, 2020, 2021]
Index: []

```
dfyesyesnono = df2[(df2["Cooler?"].str.contains("Yes")) &
(df2["Digital screen?"].str.contains("Yes"))& (df2["Menu
inclusion?"].str.contains("NO"))&
(df2["Posters?"].str.contains("No"))]
dfyesyesnono
```

Empty DataFrame

Columns: [Street, City, State, Zipcode, Decision Maker, Phone Number, Account Type, Regular, Sugar Free, Yellow Edition, Cooler?, Digital screen?, Menu inclusion?, Posters?, 2017, 2018, 2019, 2020, 2021]
Index: []

```
dfyesyesyesno = df2[(df2["Cooler?"].str.contains("Yes")) &
(df2["Digital screen?"].str.contains("Yes"))& (df2["Menu
inclusion?"].str.contains("Yes"))&
(df2["Posters?"].str.contains("No"))]
dfyesyesyesno
```


| | Street | City | State | Zipcode | Decision Maker \ |
|----|---------------------|----------|-------|---------|------------------|
| 23 | 861 Gonzales Lane | Bronx | NY | 10472 | Mia Ang |
| 24 | 267 Randall Mill Dr | New York | NY | 10033 | Kathy Rogers |
| 26 | 240 W. Manhattan St | Bronx | NY | 10462 | Mel Berkowitz |
| 31 | 7061 Bishop St | Yonkers | NY | 10701 | Raymond Heywin |

| | Phone Number | Account Type | Regular | Sugar Free | Yellow Edition |
|----|----------------|--------------|---------|------------|----------------|
| 23 | (253) 861-1301 | Restaurant | Yes | Yes | No |
| 24 | (939) 738-6471 | Restaurant | Yes | Yes | No |
| 26 | (967) 547-1542 | Restaurant | Yes | Yes | No |
| 31 | (571) 843-1746 | Club | Yes | Yes | Yes |

| | Digital screen? | Menu inclusion? | Posters? | 2017 | 2018 | 2019 | 2020 |
|----|-----------------|-----------------|----------|------|------|------|------|
| 23 | Yes | Yes | No | 1779 | 2124 | 2844 | 6877 |
| 24 | Yes | Yes | No | 570 | 1322 | 7279 | 8443 |
| 26 | Yes | Yes | No | 209 | 621 | 3098 | 7118 |
| 31 | Yes | Yes | No | 138 | 286 | 6750 | 8254 |

```
concatenatedNoAndYes = pd.concat([dfno, dfyes])
```

```
concatenatedNoAndYes
```

| | Street | City | State | Zipcode | Decision Maker \ |
|----|-------------------------|---------------|-------|---------|------------------|
| 10 | 44 W. Pheasant Street | Brooklyn | NY | 11233 | Gary Brown |
| 11 | 7488 N. Marconi Ave | Brooklyn | NY | 11237 | Jeffrey Akins |
| 14 | 44 Madison Dr | New York | NY | 10032 | Kelly Boyd |
| 15 | 9848 Linden St | New York | NY | 10011 | Dan Hill |
| 16 | 805 South Pilgrim Court | Brooklyn | NY | 11225 | George |
| 18 | 3 Warren Drive | New York | NY | 10040 | Julie Ross |
| 27 | 62 Lower River Road | Staten Island | NY | 10306 | Martin |
| 29 | 5 Tallwood St | Brooklyn | NY | 11233 | Kari Lenz |
| 42 | 424 Hall Ave | New York | NY | 10128 | Annie |

| | | | | | | |
|---------------|-----------------------|---------------|----|-------|-----------|--|
| Fuentes | | | | | | |
| 56 | 8083 8th St | Brooklyn | NY | 11209 | Russell | |
| Wallace | | | | | | |
| 57 | 2 Rock Maple Ave | New York | NY | 10029 | | |
| Shameka West | | | | | | |
| 58 | 9577 Nicolls Ave | Staten Island | NY | 10312 | Kevin | |
| Fleming | | | | | | |
| 59 | 174 Del Monte St | Brooklyn | NY | 11224 | | |
| Anna Grey | | | | | | |
| 0 | 2131 Patterson Road | Brooklyn | NY | 11201 | | |
| Dorothy Rizzo | | | | | | |
| 2 | 2285 Ladybug Drive | New York | NY | 10013 | Vin | |
| Hudson | | | | | | |
| 3 | 2930 Southern Street | New York | NY | 10005 | | |
| Susana Huels | | | | | | |
| 4 | 2807 Geraldine Lane | New York | NY | 10004 | Shanna | |
| Hettinger | | | | | | |
| 12 | 9575 Shipley Court | Brooklyn | NY | 11201 | | |
| Tim Young | | | | | | |
| 13 | 8156 Lake View Street | New York | NY | 10025 | | |
| Debra Kroll | | | | | | |
| 34 | 7839 Elm St | Staten Island | NY | 10306 | Lee | |
| Niemeyer | | | | | | |
| 36 | 640 Beechwood Dr | Bronx | NY | 10461 | | |
| Juan Scott | | | | | | |
| 38 | 81 San Carlos Road | Bronx | NY | 10463 | Dominique | |
| Johnson | | | | | | |
| 39 | 596 Coffee St | Bronx | NY | 10472 | Larry | |
| Alaimo | | | | | | |
| 41 | 9151 River St | Brooklyn | NY | 11230 | Shaun | |
| Salvatore | | | | | | |

| | Phone Number | Account Type | Regular | Sugar Free | Yellow Edition |
|-----------|----------------|--------------|---------|------------|----------------|
| Cooler? \ | | | | | |
| 10 | (459) 968-9453 | Bar | Yes | No | No |
| No | | | | | |
| 11 | (313) 417-8968 | Bar | Yes | No | No |
| No | | | | | |
| 14 | (220) 929-0797 | Bar | Yes | Yes | No |
| No | | | | | |
| 15 | (248) 450-0797 | Restaurant | Yes | Yes | No |
| No | | | | | |
| 16 | (964) 214-3742 | Restaurant | Yes | Yes | No |
| No | | | | | |
| 18 | (778) 387-0744 | Restaurant | Yes | Yes | No |
| No | | | | | |
| 27 | (743) 960-6716 | Restaurant | Yes | Yes | No |
| No | | | | | |
| 29 | (886) 554-5339 | Restaurant | Yes | Yes | No |
| No | | | | | |

| | | | | | | |
|-----------|-------|----------|-------|-----|-----|-----|
| 42 No | (462) | 693-6254 | Club | Yes | Yes | No |
| 56 No | (237) | 890-0247 | Hotel | Yes | No | No |
| 57 No | (488) | 656-0761 | Hotel | Yes | Yes | Yes |
| 58 No | (650) | 848-8284 | Hotel | Yes | Yes | Yes |
| 59 No | (980) | 437-1451 | Hotel | Yes | Yes | Yes |
| 0 Yes | (880) | 283-6803 | Bar | Yes | Yes | Yes |
| 2 Yes | (952) | 952-5573 | Bar | Yes | Yes | Yes |
| 3 Yes | (491) | 505-6064 | Bar | Yes | Yes | Yes |
| 4 Yes | (412) | 570-0596 | Bar | Yes | Yes | No |
| 12 Yes | (876) | 653-1727 | Bar | Yes | Yes | Yes |
| 13 Yes | (628) | 832-4986 | Bar | Yes | Yes | Yes |
| 34 Yes | (920) | 451-3973 | Club | Yes | Yes | Yes |
| 36 Yes | (357) | 532-0838 | Club | Yes | Yes | Yes |
| 38 Yes | (336) | 448-7026 | Club | Yes | Yes | Yes |
| 39 Yes | (242) | 869-1226 | Club | Yes | Yes | Yes |
| 41 Yes | (691) | 657-1498 | Club | Yes | Yes | Yes |

| | Digital screen? | Menu inclusion? | Posters? | 2017 | 2018 | 2019 | 2020 |
|------------|-----------------|-----------------|----------|------|------|------|------|
| 2021 | | | | | | | |
| 10 2359 | No | No | No | 7555 | 6551 | 5188 | 3436 |
| 11 5382 | No | No | No | 1532 | 2678 | 4068 | 4278 |
| 14 369 | No | No | No | 9058 | 4839 | 4776 | 4024 |
| 15 9225 | No | No | No | 3501 | 7079 | 7438 | 7443 |
| 16 7588 | No | No | No | 3916 | 4218 | 5072 | 5201 |
| 18 3815 | No | No | No | 9773 | 9179 | 8390 | 8256 |
| 27 3857 | No | No | No | 6309 | 6227 | 5123 | 4968 |
| 29 | No | No | No | 2390 | 2415 | 3461 | 3850 |

| | | | | | | | |
|------|-----|-----|-----|------|------|------|------|
| 4657 | | | | | | | |
| 42 | No | No | No | 8891 | 5952 | 5914 | 5405 |
| 4031 | | | | | | | |
| 56 | No | No | No | 8034 | 6541 | 3311 | 3254 |
| 2687 | | | | | | | |
| 57 | No | No | No | 1263 | 2517 | 8042 | 8222 |
| 9686 | | | | | | | |
| 58 | No | No | No | 1032 | 3919 | 4466 | 5568 |
| 6476 | | | | | | | |
| 59 | No | No | No | 1014 | 2254 | 4534 | 6796 |
| 7730 | | | | | | | |
| 0 | Yes | Yes | Yes | 1982 | 5388 | 7063 | 7208 |
| 9093 | | | | | | | |
| 2 | Yes | Yes | Yes | 1209 | 1534 | 1634 | 4302 |
| 9768 | | | | | | | |
| 3 | Yes | Yes | Yes | 906 | 1251 | 2897 | 4499 |
| 9428 | | | | | | | |
| 4 | Yes | Yes | Yes | 1421 | 1893 | 2722 | 4410 |
| 5873 | | | | | | | |
| 12 | Yes | Yes | Yes | 24 | 1797 | 3548 | 3668 |
| 8592 | | | | | | | |
| 13 | Yes | Yes | Yes | 861 | 1314 | 1810 | 6510 |
| 9271 | | | | | | | |
| 34 | Yes | Yes | Yes | 1092 | 3140 | 4123 | 4366 |
| 9482 | | | | | | | |
| 36 | Yes | Yes | Yes | 742 | 3751 | 4423 | 8733 |
| 9909 | | | | | | | |
| 38 | Yes | Yes | Yes | 488 | 5535 | 5775 | 7661 |
| 9206 | | | | | | | |
| 39 | Yes | Yes | Yes | 376 | 889 | 4373 | 6803 |
| 7578 | | | | | | | |
| 41 | Yes | Yes | Yes | 1038 | 3615 | 3712 | 5819 |
| 9589 | | | | | | | |

concatenatedNoAndYes['CDMP'] = concatenatedNoAndYes['Cooler?'] + concatenatedNoAndYes['Digital screen?'] + concatenatedNoAndYes['Menu inclusion?'] + concatenatedNoAndYes['Posters?']

concatenatedNoAndYes

| | Street | City | State | Zipcode | |
|------------------|-------------------------|----------|-------|---------|--------|
| Decision Maker \ | | | | | |
| 10 | 44 W. Pheasant Street | Brooklyn | NY | 11233 | |
| Gary Brown | | | | | |
| 11 | 7488 N. Marconi Ave | Brooklyn | NY | 11237 | |
| Jeffrey Akins | | | | | |
| 14 | 44 Madison Dr | New York | NY | 10032 | |
| Kelly Boyd | | | | | |
| 15 | 9848 Linden St | New York | NY | 10011 | |
| Dan Hill | | | | | |
| 16 | 805 South Pilgrim Court | Brooklyn | NY | 11225 | Javier |

| | | | | | | |
|---------------|----|-----------------------|---------------|----|-------|-----------|
| George | 18 | 3 Warren Drive | New York | NY | 10040 | |
| Julie Ross | 27 | 62 Lower River Road | Staten Island | NY | 10306 | Debra |
| Martin | 29 | 5 Tallwood St | Brooklyn | NY | 11233 | |
| Kari Lenz | 42 | 424 Hall Ave | New York | NY | 10128 | Annie |
| Fuentes | 56 | 8083 8th St | Brooklyn | NY | 11209 | Russell |
| Wallace | 57 | 2 Rock Maple Ave | New York | NY | 10029 | |
| Shameka West | 58 | 9577 Nicolls Ave | Staten Island | NY | 10312 | Kevin |
| Fleming | 59 | 174 Del Monte St | Brooklyn | NY | 11224 | |
| Anna Grey | 0 | 2131 Patterson Road | Brooklyn | NY | 11201 | |
| Dorothy Rizzo | 2 | 2285 Ladybug Drive | New York | NY | 10013 | Vin |
| Hudson | 3 | 2930 Southern Street | New York | NY | 10005 | |
| Susana Huels | 4 | 2807 Geraldine Lane | New York | NY | 10004 | Shanna |
| Hettinger | 12 | 9575 Shipley Court | Brooklyn | NY | 11201 | |
| Tim Young | 13 | 8156 Lake View Street | New York | NY | 10025 | |
| Debra Kroll | 34 | 7839 Elm St | Staten Island | NY | 10306 | Lee |
| Niemeyer | 36 | 640 Beechwood Dr | Bronx | NY | 10461 | |
| Juan Scott | 38 | 81 San Carlos Road | Bronx | NY | 10463 | Dominique |
| Johnson | 39 | 596 Coffee St | Bronx | NY | 10472 | Larry |
| Alaimo | 41 | 9151 River St | Brooklyn | NY | 11230 | Shaun |
| Salvatore | | | | | | |

| | Phone Number | Account Type | Regular | Sugar Free | Yellow Edition |
|-----------|----------------|--------------|---------|------------|----------------|
| Cooler? \ | | | | | |
| 10 | (459) 968-9453 | Bar | Yes | No | No |
| No | | | | | |
| 11 | (313) 417-8968 | Bar | Yes | No | No |
| No | | | | | |
| 14 | (220) 929-0797 | Bar | Yes | Yes | No |
| No | | | | | |
| 15 | (248) 450-0797 | Restaurant | Yes | Yes | No |
| No | | | | | |

| | | | | | | |
|-----------|-------|----------|------------|-----|-----|-----|
| 16 No | (964) | 214-3742 | Restaurant | Yes | Yes | No |
| 18 No | (778) | 387-0744 | Restaurant | Yes | Yes | No |
| 27 No | (743) | 960-6716 | Restaurant | Yes | Yes | No |
| 29 No | (886) | 554-5339 | Restaurant | Yes | Yes | No |
| 42 No | (462) | 693-6254 | Club | Yes | Yes | No |
| 56 No | (237) | 890-0247 | Hotel | Yes | No | No |
| 57 No | (488) | 656-0761 | Hotel | Yes | Yes | Yes |
| 58 No | (650) | 848-8284 | Hotel | Yes | Yes | Yes |
| 59 No | (980) | 437-1451 | Hotel | Yes | Yes | Yes |
| 0 Yes | (880) | 283-6803 | Bar | Yes | Yes | Yes |
| 2 Yes | (952) | 952-5573 | Bar | Yes | Yes | Yes |
| 3 Yes | (491) | 505-6064 | Bar | Yes | Yes | Yes |
| 4 Yes | (412) | 570-0596 | Bar | Yes | Yes | No |
| 12 Yes | (876) | 653-1727 | Bar | Yes | Yes | Yes |
| 13 Yes | (628) | 832-4986 | Bar | Yes | Yes | Yes |
| 34 Yes | (920) | 451-3973 | Club | Yes | Yes | Yes |
| 36 Yes | (357) | 532-0838 | Club | Yes | Yes | Yes |
| 38 Yes | (336) | 448-7026 | Club | Yes | Yes | Yes |
| 39 Yes | (242) | 869-1226 | Club | Yes | Yes | Yes |
| 41 Yes | (691) | 657-1498 | Club | Yes | Yes | Yes |

| | Digital screen? | Menu inclusion? | Posters? | 2017 | 2018 | 2019 | 2020 |
|------------|-----------------|-----------------|----------|------|------|------|------|
| 2021 \ | | | | | | | |
| 10 2359 | No | No | No | 7555 | 6551 | 5188 | 3436 |
| 11 5382 | No | No | No | 1532 | 2678 | 4068 | 4278 |
| 14 369 | No | No | No | 9058 | 4839 | 4776 | 4024 |
| 15 | No | No | No | 3501 | 7079 | 7438 | 7443 |

| | | | | | | | |
|------|-----|-----|-----|------|------|------|------|
| 9225 | | | | | | | |
| 16 | No | No | No | 3916 | 4218 | 5072 | 5201 |
| 7588 | | | | | | | |
| 18 | No | No | No | 9773 | 9179 | 8390 | 8256 |
| 3815 | | | | | | | |
| 27 | No | No | No | 6309 | 6227 | 5123 | 4968 |
| 3857 | | | | | | | |
| 29 | No | No | No | 2390 | 2415 | 3461 | 3850 |
| 4657 | | | | | | | |
| 42 | No | No | No | 8891 | 5952 | 5914 | 5405 |
| 4031 | | | | | | | |
| 56 | No | No | No | 8034 | 6541 | 3311 | 3254 |
| 2687 | | | | | | | |
| 57 | No | No | No | 1263 | 2517 | 8042 | 8222 |
| 9686 | | | | | | | |
| 58 | No | No | No | 1032 | 3919 | 4466 | 5568 |
| 6476 | | | | | | | |
| 59 | No | No | No | 1014 | 2254 | 4534 | 6796 |
| 7730 | | | | | | | |
| 0 | Yes | Yes | Yes | 1982 | 5388 | 7063 | 7208 |
| 9093 | | | | | | | |
| 2 | Yes | Yes | Yes | 1209 | 1534 | 1634 | 4302 |
| 9768 | | | | | | | |
| 3 | Yes | Yes | Yes | 906 | 1251 | 2897 | 4499 |
| 9428 | | | | | | | |
| 4 | Yes | Yes | Yes | 1421 | 1893 | 2722 | 4410 |
| 5873 | | | | | | | |
| 12 | Yes | Yes | Yes | 24 | 1797 | 3548 | 3668 |
| 8592 | | | | | | | |
| 13 | Yes | Yes | Yes | 861 | 1314 | 1810 | 6510 |
| 9271 | | | | | | | |
| 34 | Yes | Yes | Yes | 1092 | 3140 | 4123 | 4366 |
| 9482 | | | | | | | |
| 36 | Yes | Yes | Yes | 742 | 3751 | 4423 | 8733 |
| 9909 | | | | | | | |
| 38 | Yes | Yes | Yes | 488 | 5535 | 5775 | 7661 |
| 9206 | | | | | | | |
| 39 | Yes | Yes | Yes | 376 | 889 | 4373 | 6803 |
| 7578 | | | | | | | |
| 41 | Yes | Yes | Yes | 1038 | 3615 | 3712 | 5819 |
| 9589 | | | | | | | |

| | |
|----|----------|
| | CDMP |
| 10 | NoNoNoNo |
| 11 | NoNoNoNo |
| 14 | NoNoNoNo |
| 15 | NoNoNoNo |
| 16 | NoNoNoNo |
| 18 | NoNoNoNo |
| 27 | NoNoNoNo |

```

29      NoNoNoNo
42      NoNoNoNo
56      NoNoNoNo
57      NoNoNoNo
58      NoNoNoNo
59      NoNoNoNo
0  YesYesYesYes
2  YesYesYesYes
3  YesYesYesYes
4  YesYesYesYes
12 YesYesYesYes
13 YesYesYesYes
34 YesYesYesYes
36 YesYesYesYes
38 YesYesYesYes
39 YesYesYesYes
41 YesYesYesYes

```

```

#pd.concat([dataFrame1,dataFrame2]).drop_duplicates(keep=False)
uncommonrows =
pd.concat([concatenatedNoAndYes,df2]).drop_duplicates(keep=False)
uncommonrows

```

| | Street | City | State | Zipcode | Decision |
|----------------------------|---------------|------|-------|---------|----------|
| Maker \ | | | | | |
| 10 44 W. Pheasant Street | Brooklyn | NY | 11233 | Gary | |
| 11 7488 N. Marconi Ave | Brooklyn | NY | 11237 | Jeffrey | |
| 14 44 Madison Dr | New York | NY | 10032 | Kelly | |
| 15 9848 Linden St | New York | NY | 10011 | Dan | |
| 16 805 South Pilgrim Court | Brooklyn | NY | 11225 | Javier | |
| .. | ... | ... | ... | | |
| ... | | | | | |
| 55 419 E. Henry Ave | New York | NY | 10031 | Carlos | |
| 56 8083 8th St | Brooklyn | NY | 11209 | Russell | |
| 57 2 Rock Maple Ave | New York | NY | 10029 | Shameka | |
| 58 9577 Nicolls Ave | Staten Island | NY | 10312 | Kevin | |
| 59 174 Del Monte St | Brooklyn | NY | 11224 | Anna | |

```

Phone Number Account Type Regular Sugar Free Yellow Edition
Cooler? \

```


| | | | | | | |
|-----------|-------|----------|------------|-----|-----|-----|
| 10 No | (459) | 968-9453 | Bar | Yes | No | No |
| 11 No | (313) | 417-8968 | Bar | Yes | No | No |
| 14 No | (220) | 929-0797 | Bar | Yes | Yes | No |
| 15 No | (248) | 450-0797 | Restaurant | Yes | Yes | No |
| 16 No | (964) | 214-3742 | Restaurant | Yes | Yes | No |
| .. | ... | ... | ... | ... | ... | ... |
| 55 Yes | (201) | 363-0653 | Hotel | Yes | Yes | Yes |
| 56 No | (237) | 890-0247 | Hotel | Yes | No | No |
| 57 No | (488) | 656-0761 | Hotel | Yes | Yes | Yes |
| 58 No | (650) | 848-8284 | Hotel | Yes | Yes | Yes |
| 59 No | (980) | 437-1451 | Hotel | Yes | Yes | Yes |

| | Digital screen? | Menu inclusion? | Posters? | 2017 | 2018 | 2019 | 2020 |
|------------|-----------------|-----------------|----------|------|------|------|------|
| 2021 \ | | | | | | | |
| 10 2359 | No | No | No | 7555 | 6551 | 5188 | 3436 |
| 11 5382 | No | No | No | 1532 | 2678 | 4068 | 4278 |
| 14 369 | No | No | No | 9058 | 4839 | 4776 | 4024 |
| 15 9225 | No | No | No | 3501 | 7079 | 7438 | 7443 |
| 16 7588 | No | No | No | 3916 | 4218 | 5072 | 5201 |
| .. | ... | ... | ... | ... | ... | ... | ... |
| 55 6357 | No | No | No | 128 | 416 | 747 | 1028 |
| 56 2687 | No | No | No | 8034 | 6541 | 3311 | 3254 |
| 57 9686 | No | No | No | 1263 | 2517 | 8042 | 8222 |
| 58 6476 | No | No | No | 1032 | 3919 | 4466 | 5568 |
| 59 7730 | No | No | No | 1014 | 2254 | 4534 | 6796 |

CDMP
10 NoNoNoNo

```

11  NoNoNoNo
14  NoNoNoNo
15  NoNoNoNo
16  NoNoNoNo
..
55      NaN
56      NaN
57      NaN
58      NaN
59      NaN

```

[84 rows x 20 columns]

```

uncommonrows['CDMP'] = uncommonrows['Cooler?']+uncommonrows['Digital
screen?']+uncommonrows['Menu inclusion?']+uncommonrows['Posters?']

```

concatenatedNoAndYes

```

uncommonrows['CDMP'].value_counts()

```

```

NoNoNoNo      26
YesYesYesYes   22
NoNoYesNo      12
YesNoYesNo      8
NoNoYesYes      5
YesYesYesNo     4
NoYesNoNo       2
YesNoNoNo       2
NoYesYesYes     1
NoYesYesNo      1
YesYesNoNo      1
Name: CDMP, dtype: int64

```

```

uncommonrows.groupby('CDMP')[2017,2018,2019,2020,2021].sum()

```

<ipython-input-237-93a72da4a489>:1: FutureWarning: Indexing with multiple keys (implicitly converted to a tuple of keys) will be deprecated, use a list instead.

```

uncommonrows.groupby('CDMP')[2017,2018,2019,2020,2021].sum()

```

| | 2017 | 2018 | 2019 | 2020 | 2021 |
|-------------|--------|--------|--------|--------|--------|
| CDMP | | | | | |
| NoNoNoNo | 128536 | 128738 | 139566 | 141402 | 135724 |
| NoNoYesNo | 54655 | 54749 | 54711 | 62646 | 69939 |
| NoNoYesYes | 30254 | 29905 | 24952 | 30853 | 27934 |
| NoYesNoNo | 14487 | 13777 | 11743 | 3757 | 1344 |
| NoYesYesNo | 2341 | 6105 | 7777 | 7891 | 8758 |
| NoYesYesYes | 2786 | 3804 | 4121 | 6210 | 6909 |
| YesNoNoNo | 1418 | 4449 | 7703 | 8957 | 15191 |
| YesNoYesNo | 6501 | 25146 | 38130 | 56509 | 68967 |

| | | | | | |
|--------------|-------|-------|-------|--------|--------|
| YesYesNoNo | 431 | 6231 | 7478 | 8039 | 8271 |
| YesYesYesNo | 2696 | 4353 | 19971 | 30692 | 36230 |
| YesYesYesYes | 20278 | 60214 | 84160 | 127958 | 195578 |

```
concatenatedNoAndYes['CDMP'].value_counts()
```

```
NoNoNoNo      13
YesYesYesYes   11
Name: CDMP, dtype: int64
```

```
concatenatedNoAndYes.groupby('CDMP')[2017,2018,2019,2020,2021].sum()
```

```
<ipython-input-239-8d276fba2ce1>:1: FutureWarning: Indexing with
multiple keys (implicitly converted to a tuple of keys) will be
deprecated, use a list instead.
```

```
concatenatedNoAndYes.groupby('CDMP')[2017,2018,2019,2020,2021].sum()
```

| | 2017 | 2018 | 2019 | 2020 | 2021 |
|--------------|-------|-------|-------|-------|-------|
| CDMP | | | | | |
| NoNoNoNo | 64268 | 64369 | 69783 | 70701 | 67862 |
| YesYesYesYes | 10139 | 30107 | 42080 | 63979 | 97789 |

```
concatenateAdviceyesno = pd.concat([uncommonrows.groupby('CDMP')
[2017,2018,2019,2020,2021].sum(), concatenatedNoAndYes.groupby('CDMP')
[2017,2018,2019,2020,2021].sum()])
```

```
<ipython-input-240-613208829ccd>:1: FutureWarning: Indexing with
multiple keys (implicitly converted to a tuple of keys) will be
deprecated, use a list instead.
```

```
concatenateAdviceyesno = pd.concat([uncommonrows.groupby('CDMP')
[2017,2018,2019,2020,2021].sum(), concatenatedNoAndYes.groupby('CDMP')
[2017,2018,2019,2020,2021].sum()])
```

```
concatenateAdviceyesno
```

| | 2017 | 2018 | 2019 | 2020 | 2021 |
|--------------|--------|--------|--------|--------|--------|
| CDMP | | | | | |
| NoNoNoNo | 128536 | 128738 | 139566 | 141402 | 135724 |
| NoNoYesNo | 54655 | 54749 | 54711 | 62646 | 69939 |
| NoNoYesYes | 30254 | 29905 | 24952 | 30853 | 27934 |
| NoYesNoNo | 14487 | 13777 | 11743 | 3757 | 1344 |
| NoYesYesNo | 2341 | 6105 | 7777 | 7891 | 8758 |
| NoYesYesYes | 2786 | 3804 | 4121 | 6210 | 6909 |
| YesNoNoNo | 1418 | 4449 | 7703 | 8957 | 15191 |
| YesNoYesNo | 6501 | 25146 | 38130 | 56509 | 68967 |
| YesYesNoNo | 431 | 6231 | 7478 | 8039 | 8271 |
| YesYesYesNo | 2696 | 4353 | 19971 | 30692 | 36230 |
| YesYesYesYes | 20278 | 60214 | 84160 | 127958 | 195578 |
| NoNoNoNo | 64268 | 64369 | 69783 | 70701 | 67862 |
| YesYesYesYes | 10139 | 30107 | 42080 | 63979 | 97789 |

Figure 1 consists of two pie charts. The left chart represents the 2017 CSES data, and the right chart represents the 2018 CSES data. Both charts show the distribution of responses for a question with four possible answers (Yes/No) for each of four different groups (represented by the four segments in the pie). The legend for both charts lists 16 possible combinations of responses, color-coded to match the segments in the pie charts.

2017 CSES Data (Left Chart):

| Response Combination | Percentage |
|----------------------|------------|
| No/No/No/No | 37.9% |
| No/No/No/Yes | 19.0% |
| No/No/Yes/Yes | 16.1% |
| No/No/Yes/No | 8.9% |
| No/Yes/Yes/Yes | 3.0% |
| No/Yes/Yes/No | 6.0% |
| No/Yes/No/No | 4.3% |
| No/Yes/No/Yes | 0.2% |
| Yes/Yes/Yes/Yes | 0.2% |
| Yes/Yes/Yes/No | 0.2% |
| Yes/Yes/No/No | 0.2% |
| Yes/Yes/No/Yes | 0.2% |
| Yes/No/No/No | 0.2% |
| Yes/No/No/Yes | 0.2% |
| Yes/No/Yes/Yes | 0.2% |
| Yes/No/Yes/No | 0.2% |

2018 CSES Data (Right Chart):

| Response Combination | Percentage |
|----------------------|------------|
| Yes/Yes/Yes/Yes | 29.8% |
| No/No/No/No | 14.9% |
| No/No/No/Yes | 13.9% |
| No/No/Yes/Yes | 7.0% |
| No/No/Yes/No | 12.7% |
| No/Yes/Yes/Yes | 6.9% |
| No/Yes/Yes/No | 3.2% |
| No/Yes/No/No | 1.4% |
| No/Yes/No/Yes | 1.0% |
| Yes/Yes/Yes/No | 1.0% |
| Yes/Yes/No/No | 1.4% |
| Yes/Yes/No/Yes | 1.0% |
| Yes/No/No/No | 5.8% |
| Yes/No/No/Yes | 1.0% |
| Yes/No/Yes/Yes | 1.0% |
| Yes/No/Yes/No | 1.0% |

Figure 1 consists of two pie charts, one for the 2019 survey and one for the 2020 survey, showing the distribution of responses across 16 categories. The categories are defined by combinations of 'Yes' and 'No' responses for three different questions, resulting in 2^3 = 8 possible combinations, each further divided into two sub-categories.

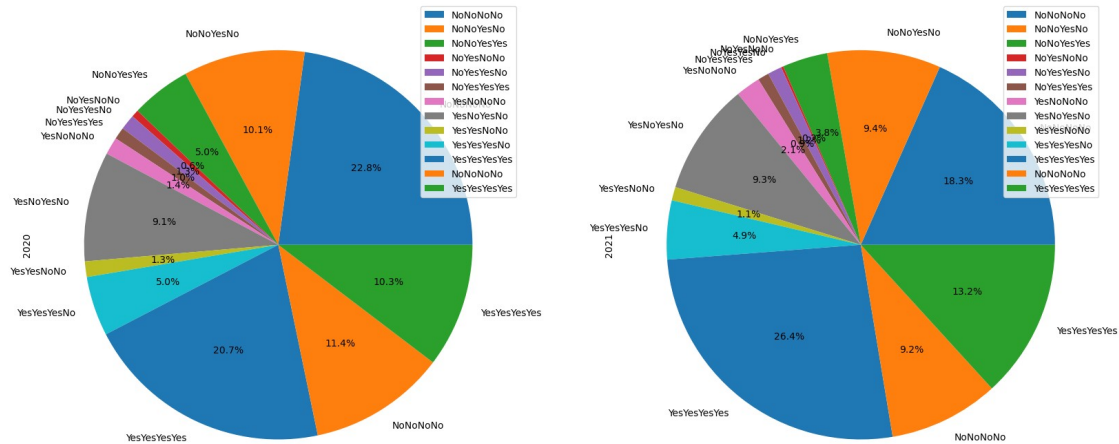
2019 Survey Data:

| Category | Percentage |
|--------------|------------|
| NoNoNoNo | 27.2% |
| NoNoYesNo | 10.7% |
| NoNoYesYes | 4.9% |
| NoYesNoNo | 2.3% |
| NoYesYesNo | 1.5% |
| NoYesYesYes | 0.6% |
| YesNoNoNo | 1.5% |
| YesNoYesNo | 7.4% |
| YesNoYesYes | 1.5% |
| YesYesNoNo | 3.9% |
| YesYesYesNo | 16.4% |
| YesYesYesYes | 8.2% |
| NoNoNoNo | 13.6% |

2020 Survey Data:

| Category | Percentage |
|--------------|------------|
| NoNoNoNo | 22.8% |
| NoNoYesNo | 10.1% |
| NoNoYesYes | 5.0% |
| NoYesNoNo | 0.5% |
| NoYesYesNo | 1.4% |
| NoYesYesYes | 0.5% |
| YesNoNoNo | 9.1% |
| YesNoYesNo | 1.3% |
| YesNoYesYes | 5.0% |
| YesYesNoNo | 20.7% |
| YesYesYesNo | 11.4% |
| YesYesYesYes | 10.3% |

```
#ax=
concatenateAdviceyesno[[2020,2021]].plot.pie(subplots=True,
figsize=(20, 20),autopct = '%1.1f%%')
#ax.set_facecolor("whitesmoke")
plt.show()
```

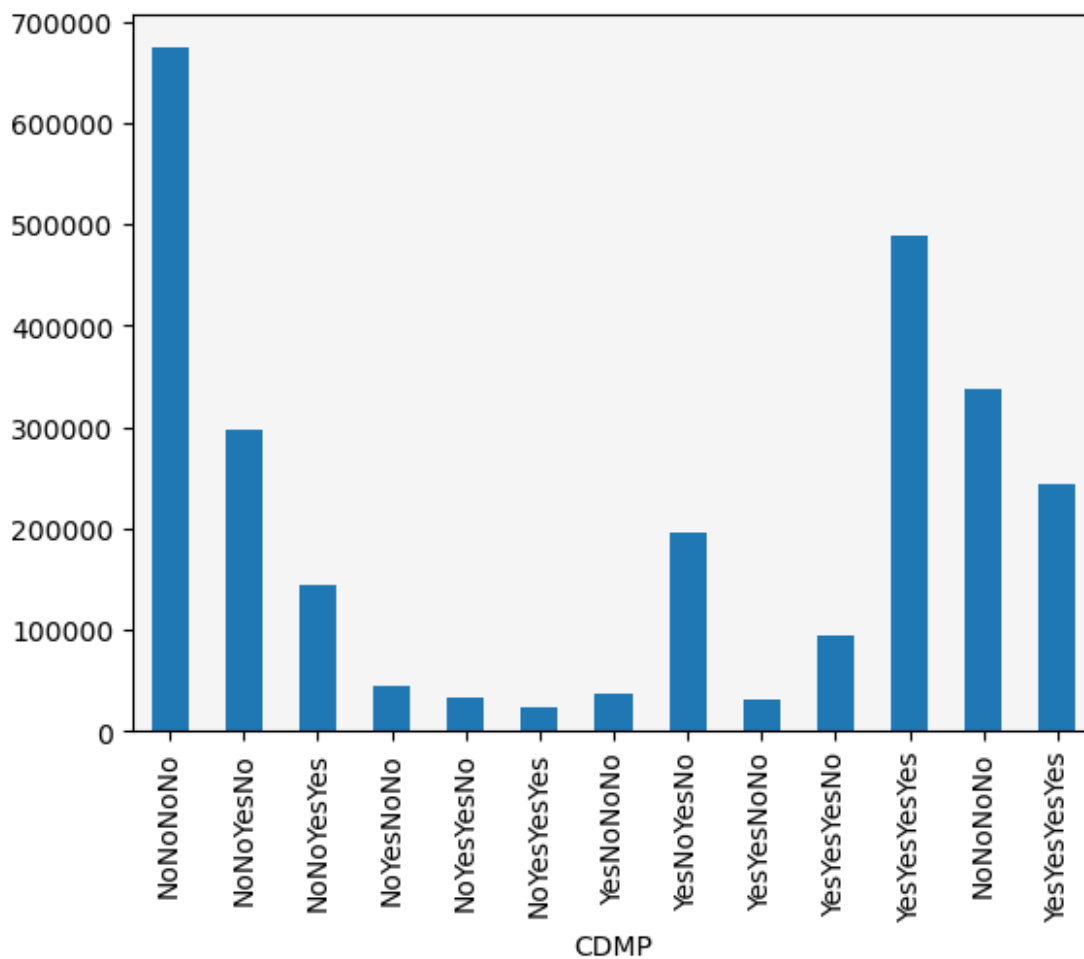


```
concatenateAdviceyesno["sum"] = concatenateAdviceyesno.sum(axis=1)
```

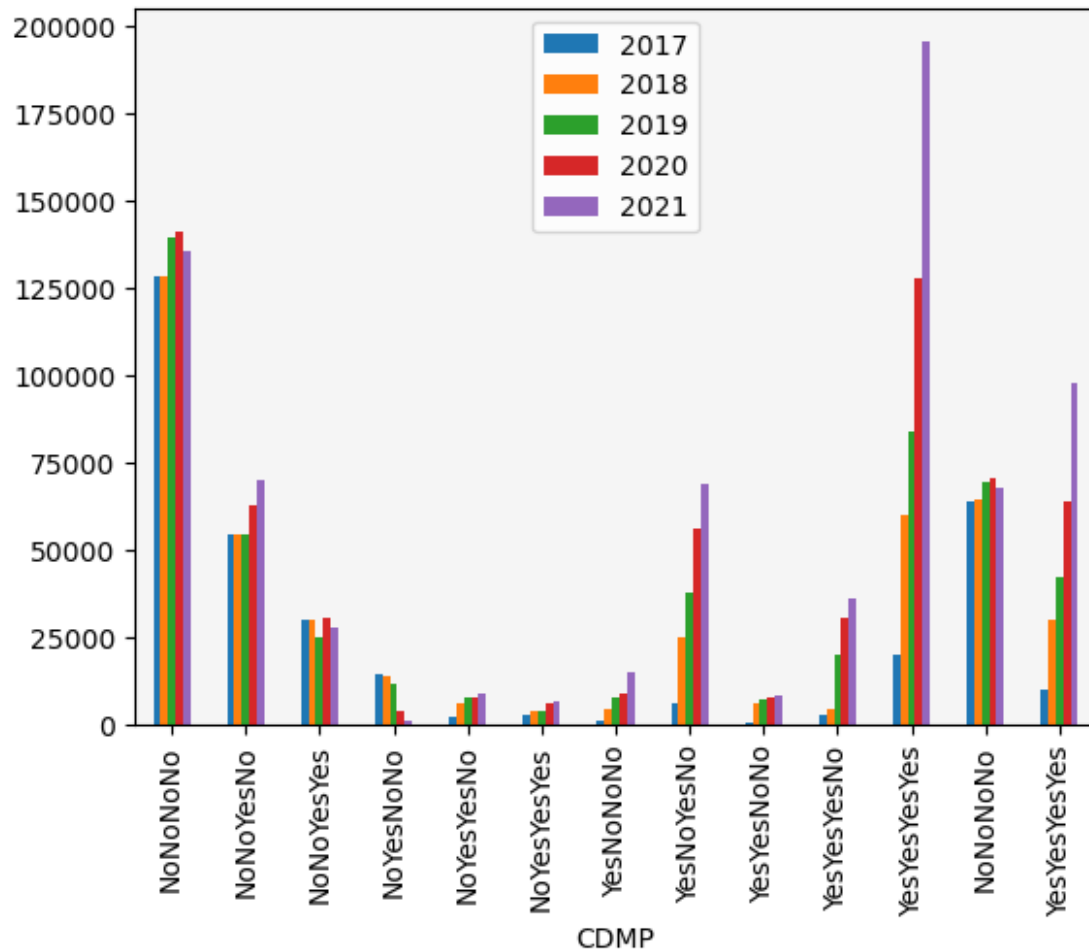
```
concatenateAdviceyesno
```

| | 2017 | 2018 | 2019 | 2020 | 2021 | sum |
|--------------|--------|--------|--------|--------|--------|--------|
| CDMP | | | | | | |
| NoNoNoNo | 128536 | 128738 | 139566 | 141402 | 135724 | 673966 |
| NoNoYesNo | 54655 | 54749 | 54711 | 62646 | 69939 | 296700 |
| NoNoYesYes | 30254 | 29905 | 24952 | 30853 | 27934 | 143898 |
| NoYesNoNo | 14487 | 13777 | 11743 | 3757 | 1344 | 45108 |
| NoYesYesNo | 2341 | 6105 | 7777 | 7891 | 8758 | 32872 |
| NoYesYesYes | 2786 | 3804 | 4121 | 6210 | 6909 | 23830 |
| YesNoNoNo | 1418 | 4449 | 7703 | 8957 | 15191 | 37718 |
| YesNoYesNo | 6501 | 25146 | 38130 | 56509 | 68967 | 195253 |
| YesYesNoNo | 431 | 6231 | 7478 | 8039 | 8271 | 30450 |
| YesYesYesNo | 2696 | 4353 | 19971 | 30692 | 36230 | 93942 |
| YesYesYesYes | 20278 | 60214 | 84160 | 127958 | 195578 | 488188 |
| NoNoNoNo | 64268 | 64369 | 69783 | 70701 | 67862 | 336983 |
| YesYesYesYes | 10139 | 30107 | 42080 | 63979 | 97789 | 244094 |

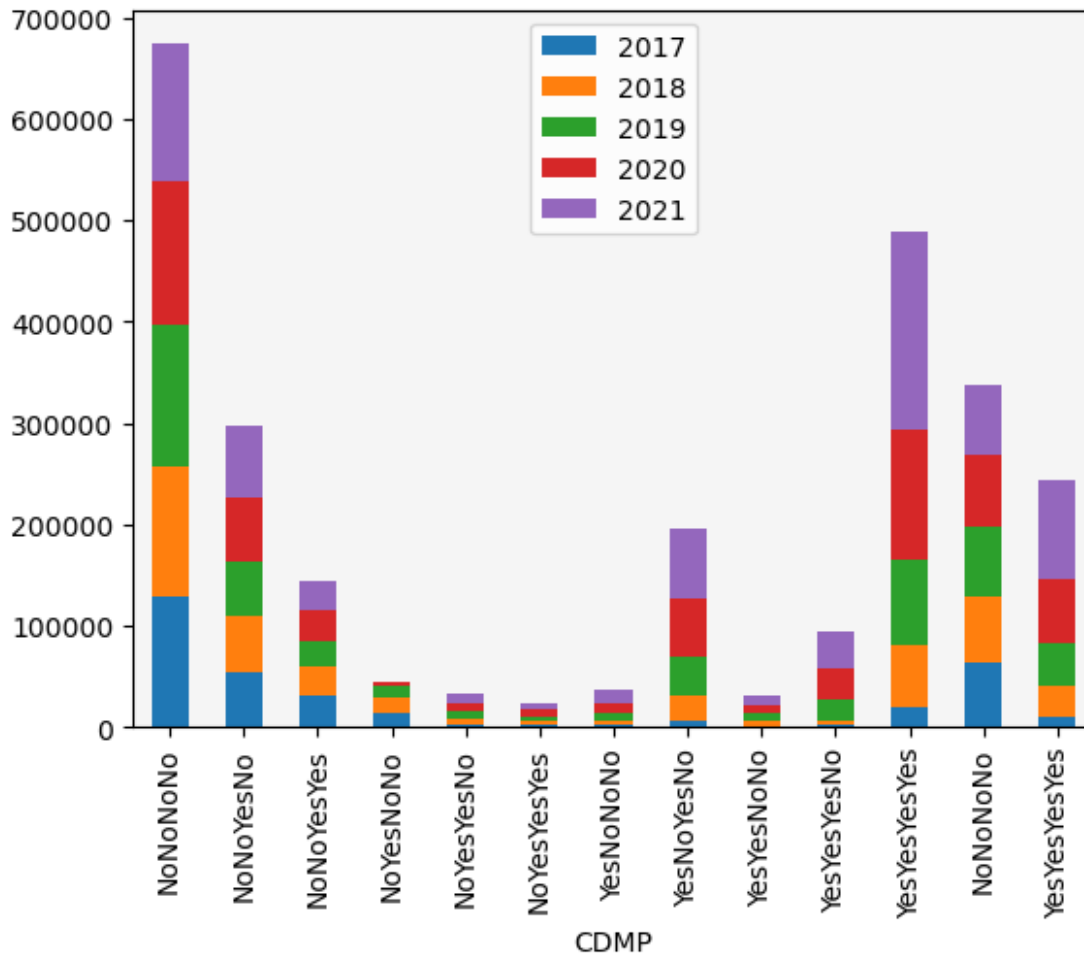
```
ax = concatenateAdviceyesno['sum'].plot(kind="bar")
ax.set_facecolor("whitesmoke")
plt.show()
```



```
ax =
concatenateAdviceyesno[[2017,2018,2019,2020,2021]].plot(kind="bar")
ax.set_facecolor("whitesmoke")
plt.show()
```



```
# df.plot.bar(stacked=True);
ax =
concatenateAdviceyesno[[2017,2018,2019,2020,2021]].plot(kind="bar",sta
cked=True)
ax.set_facecolor("whitesmoke")
plt.show()
```



```
concatenatedNoAndYes['RSY'] = concatenatedNoAndYes['Regular']+
concatenatedNoAndYes['Sugar Free']+ concatenatedNoAndYes['Yellow
Edition']
```

```
concatenatedNoAndYes
```

| Decision Maker \ | Street | City | State | Zipcode | |
|------------------|-------------------------|----------|-------|---------|--------|
| 10 Gary Brown | 44 W. Pheasant Street | Brooklyn | NY | 11233 | |
| 11 Jeffrey Akins | 7488 N. Marconi Ave | Brooklyn | NY | 11237 | |
| 14 Kelly Boyd | 44 Madison Dr | New York | NY | 10032 | |
| 15 Dan Hill | 9848 Linden St | New York | NY | 10011 | |
| 16 George | 805 South Pilgrim Court | Brooklyn | NY | 11225 | Javier |
| 18 | 3 Warren Drive | New York | NY | 10040 | |

| | | | | | | |
|---------------|----|-----------------------|---------------|----|-------|-----------|
| Julie Ross | 27 | 62 Lower River Road | Staten Island | NY | 10306 | Debra |
| Martin | 29 | 5 Tallwood St | Brooklyn | NY | 11233 | |
| Kari Lenz | 42 | 424 Hall Ave | New York | NY | 10128 | Annie |
| Fuentes | 56 | 8083 8th St | Brooklyn | NY | 11209 | Russell |
| Wallace | 57 | 2 Rock Maple Ave | New York | NY | 10029 | |
| Shameka West | 58 | 9577 Nicolls Ave | Staten Island | NY | 10312 | Kevin |
| Fleming | 59 | 174 Del Monte St | Brooklyn | NY | 11224 | |
| Anna Grey | 0 | 2131 Patterson Road | Brooklyn | NY | 11201 | |
| Dorothy Rizzo | 2 | 2285 Ladybug Drive | New York | NY | 10013 | Vin |
| Hudson | 3 | 2930 Southern Street | New York | NY | 10005 | |
| Susana Huels | 4 | 2807 Geraldine Lane | New York | NY | 10004 | Shanna |
| Hettinger | 12 | 9575 Shipley Court | Brooklyn | NY | 11201 | |
| Tim Young | 13 | 8156 Lake View Street | New York | NY | 10025 | |
| Debra Kroll | 34 | 7839 Elm St | Staten Island | NY | 10306 | Lee |
| Niemeyer | 36 | 640 Beechwood Dr | Bronx | NY | 10461 | |
| Juan Scott | 38 | 81 San Carlos Road | Bronx | NY | 10463 | Dominique |
| Johnson | 39 | 596 Coffee St | Bronx | NY | 10472 | Larry |
| Alaimo | 41 | 9151 River St | Brooklyn | NY | 11230 | Shaun |
| Salvatore | | | | | | |

| | Phone Number | Account Type | Regular | Sugar Free | Yellow Edition | ... |
|----|----------------|--------------|---------|------------|----------------|-----|
| \ | | | | | | |
| 10 | (459) 968-9453 | Bar | Yes | No | No | ... |
| 11 | (313) 417-8968 | Bar | Yes | No | No | ... |
| 14 | (220) 929-0797 | Bar | Yes | Yes | No | ... |
| 15 | (248) 450-0797 | Restaurant | Yes | Yes | No | ... |
| 16 | (964) 214-3742 | Restaurant | Yes | Yes | No | ... |

| | | | | | | | |
|----|-------|----------|------------|-----|-----|-----|-----|
| 18 | (778) | 387-0744 | Restaurant | Yes | Yes | No | ... |
| 27 | (743) | 960-6716 | Restaurant | Yes | Yes | No | ... |
| 29 | (886) | 554-5339 | Restaurant | Yes | Yes | No | ... |
| 42 | (462) | 693-6254 | Club | Yes | Yes | No | ... |
| 56 | (237) | 890-0247 | Hotel | Yes | No | No | ... |
| 57 | (488) | 656-0761 | Hotel | Yes | Yes | Yes | ... |
| 58 | (650) | 848-8284 | Hotel | Yes | Yes | Yes | ... |
| 59 | (980) | 437-1451 | Hotel | Yes | Yes | Yes | ... |
| 0 | (880) | 283-6803 | Bar | Yes | Yes | Yes | ... |
| 2 | (952) | 952-5573 | Bar | Yes | Yes | Yes | ... |
| 3 | (491) | 505-6064 | Bar | Yes | Yes | Yes | ... |
| 4 | (412) | 570-0596 | Bar | Yes | Yes | No | ... |
| 12 | (876) | 653-1727 | Bar | Yes | Yes | Yes | ... |
| 13 | (628) | 832-4986 | Bar | Yes | Yes | Yes | ... |
| 34 | (920) | 451-3973 | Club | Yes | Yes | Yes | ... |
| 36 | (357) | 532-0838 | Club | Yes | Yes | Yes | ... |
| 38 | (336) | 448-7026 | Club | Yes | Yes | Yes | ... |
| 39 | (242) | 869-1226 | Club | Yes | Yes | Yes | ... |
| 41 | (691) | 657-1498 | Club | Yes | Yes | Yes | ... |

| | Digital screen? | Menu inclusion? | Posters? | 2017 | 2018 | 2019 | 2020 |
|--------|-----------------|-----------------|----------|------|------|------|------|
| 2021 \ | | | | | | | |
| 10 | No | No | No | 7555 | 6551 | 5188 | 3436 |
| 2359 | | | | | | | |
| 11 | No | No | No | 1532 | 2678 | 4068 | 4278 |
| 5382 | | | | | | | |
| 14 | No | No | No | 9058 | 4839 | 4776 | 4024 |
| 369 | | | | | | | |
| 15 | No | No | No | 3501 | 7079 | 7438 | 7443 |

| | | | | | | | |
|------|-----|-----|-----|------|------|------|------|
| 9225 | | | | | | | |
| 16 | No | No | No | 3916 | 4218 | 5072 | 5201 |
| 7588 | | | | | | | |
| 18 | No | No | No | 9773 | 9179 | 8390 | 8256 |
| 3815 | | | | | | | |
| 27 | No | No | No | 6309 | 6227 | 5123 | 4968 |
| 3857 | | | | | | | |
| 29 | No | No | No | 2390 | 2415 | 3461 | 3850 |
| 4657 | | | | | | | |
| 42 | No | No | No | 8891 | 5952 | 5914 | 5405 |
| 4031 | | | | | | | |
| 56 | No | No | No | 8034 | 6541 | 3311 | 3254 |
| 2687 | | | | | | | |
| 57 | No | No | No | 1263 | 2517 | 8042 | 8222 |
| 9686 | | | | | | | |
| 58 | No | No | No | 1032 | 3919 | 4466 | 5568 |
| 6476 | | | | | | | |
| 59 | No | No | No | 1014 | 2254 | 4534 | 6796 |
| 7730 | | | | | | | |
| 0 | Yes | Yes | Yes | 1982 | 5388 | 7063 | 7208 |
| 9093 | | | | | | | |
| 2 | Yes | Yes | Yes | 1209 | 1534 | 1634 | 4302 |
| 9768 | | | | | | | |
| 3 | Yes | Yes | Yes | 906 | 1251 | 2897 | 4499 |
| 9428 | | | | | | | |
| 4 | Yes | Yes | Yes | 1421 | 1893 | 2722 | 4410 |
| 5873 | | | | | | | |
| 12 | Yes | Yes | Yes | 24 | 1797 | 3548 | 3668 |
| 8592 | | | | | | | |
| 13 | Yes | Yes | Yes | 861 | 1314 | 1810 | 6510 |
| 9271 | | | | | | | |
| 34 | Yes | Yes | Yes | 1092 | 3140 | 4123 | 4366 |
| 9482 | | | | | | | |
| 36 | Yes | Yes | Yes | 742 | 3751 | 4423 | 8733 |
| 9909 | | | | | | | |
| 38 | Yes | Yes | Yes | 488 | 5535 | 5775 | 7661 |
| 9206 | | | | | | | |
| 39 | Yes | Yes | Yes | 376 | 889 | 4373 | 6803 |
| 7578 | | | | | | | |
| 41 | Yes | Yes | Yes | 1038 | 3615 | 3712 | 5819 |
| 9589 | | | | | | | |

| | CDMP | | | | RSY | | |
|----|------|----|----|----|-----|-----|----|
| 10 | No | No | No | No | Yes | No | No |
| 11 | No | No | No | No | Yes | No | No |
| 14 | No | No | No | No | Yes | Yes | No |
| 15 | No | No | No | No | Yes | Yes | No |
| 16 | No | No | No | No | Yes | Yes | No |
| 18 | No | No | No | No | Yes | Yes | No |
| 27 | No | No | No | No | Yes | Yes | No |

| | | | | | | | |
|----|-----|-----|-----|-----|-----|-----|-----|
| 29 | No | No | No | No | Yes | Yes | No |
| 42 | No | No | No | No | Yes | Yes | No |
| 56 | No | No | No | No | Yes | No | No |
| 57 | No | No | No | No | Yes | Yes | Yes |
| 58 | No | No | No | No | Yes | Yes | Yes |
| 59 | No | No | No | No | Yes | Yes | Yes |
| 0 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 2 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 3 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 4 | Yes | Yes | Yes | Yes | Yes | Yes | No |
| 12 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 13 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 34 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 36 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 38 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 39 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 41 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

[24 rows x 21 columns]

```
concatenatedNoAndYes.groupby('RSY')[2017,2018,2019,2020,2021].sum()
```

<ipython-input-252-c101892d09e9>:1: FutureWarning: Indexing with multiple keys (implicitly converted to a tuple of keys) will be deprecated, use a list instead.

```
concatenatedNoAndYes.groupby('RSY')[2017,2018,2019,2020,2021].sum()
```

| | 2017 | 2018 | 2019 | 2020 | 2021 |
|-----------|-------|-------|-------|-------|--------|
| RSY | | | | | |
| YesNoNo | 17121 | 15770 | 12567 | 10968 | 10428 |
| YesYesNo | 45259 | 41802 | 42896 | 43557 | 39415 |
| YesYesYes | 12027 | 36904 | 56400 | 80155 | 115808 |

```
RSYGPSUM = concatenatedNoAndYes.groupby('RSY').sum()
```

RSYGPSUM

| | 2017 | 2018 | 2019 | 2020 | 2021 |
|-----------|-------|-------|-------|-------|--------|
| RSY | | | | | |
| YesNoNo | 17121 | 15770 | 12567 | 10968 | 10428 |
| YesYesNo | 45259 | 41802 | 42896 | 43557 | 39415 |
| YesYesYes | 12027 | 36904 | 56400 | 80155 | 115808 |

```
RSYVALUECOUNT = concatenatedNoAndYes['RSY'].value_counts()
```

RSYVALUECOUNT

| | |
|-----------|----|
| YesYesYes | 13 |
| YesYesNo | 8 |

```
YesNoNo      3
Name: RSY, dtype: int64
```

```
RSYGPSUM['RSYVALUECOUNT'] = RSYVALUECOUNT
```

```
RSYGPSUM
```

| | 2017 | 2018 | 2019 | 2020 | 2021 | RSYVALUECOUNT |
|-----------|-------|-------|-------|-------|--------|---------------|
| RSY | | | | | | |
| YesNoNo | 17121 | 15770 | 12567 | 10968 | 10428 | 3 |
| YesYesNo | 45259 | 41802 | 42896 | 43557 | 39415 | 8 |
| YesYesYes | 12027 | 36904 | 56400 | 80155 | 115808 | 13 |

Interpretation:

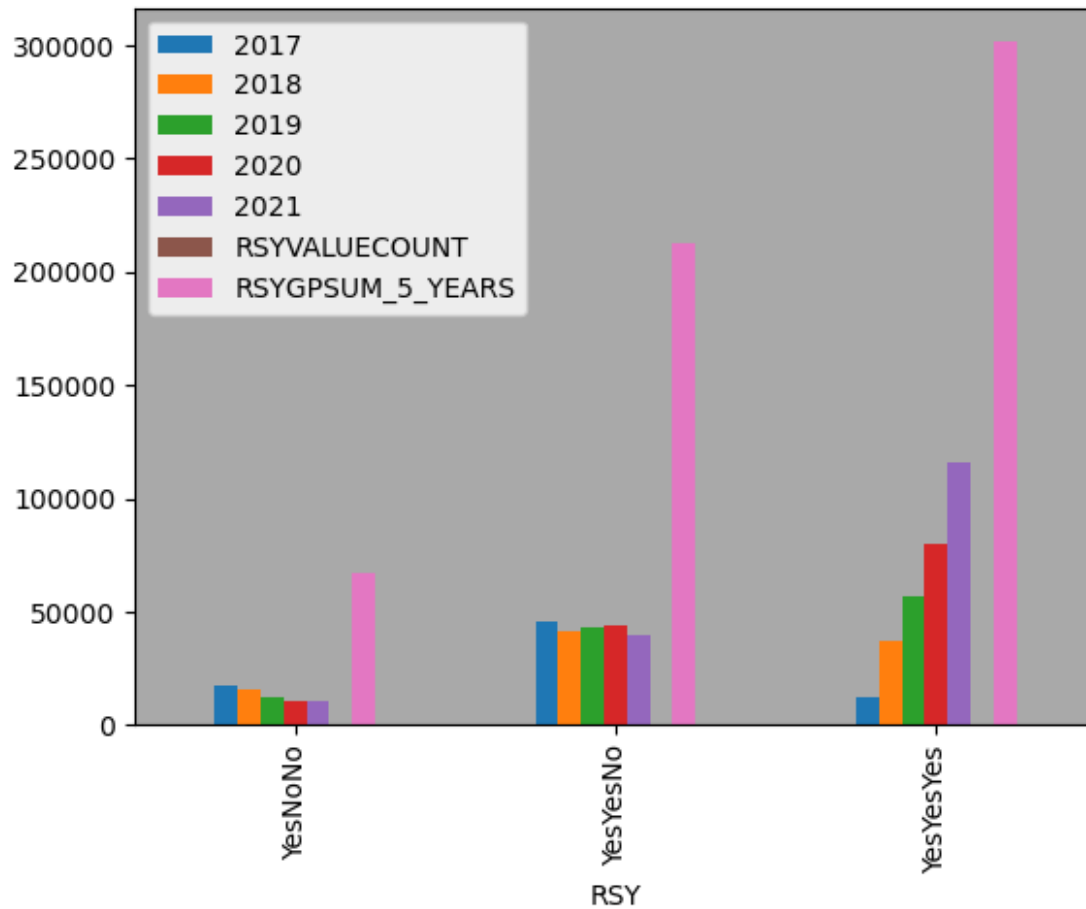
13 decision Makers order all flavors, 8 decision Makers order 2 flavors, and 3 decision Makers order 1 flavors.

```
RSYGPSUM['RSYGPSUM_5_YEARS'] = RSYGPSUM.sum(axis=1)
```

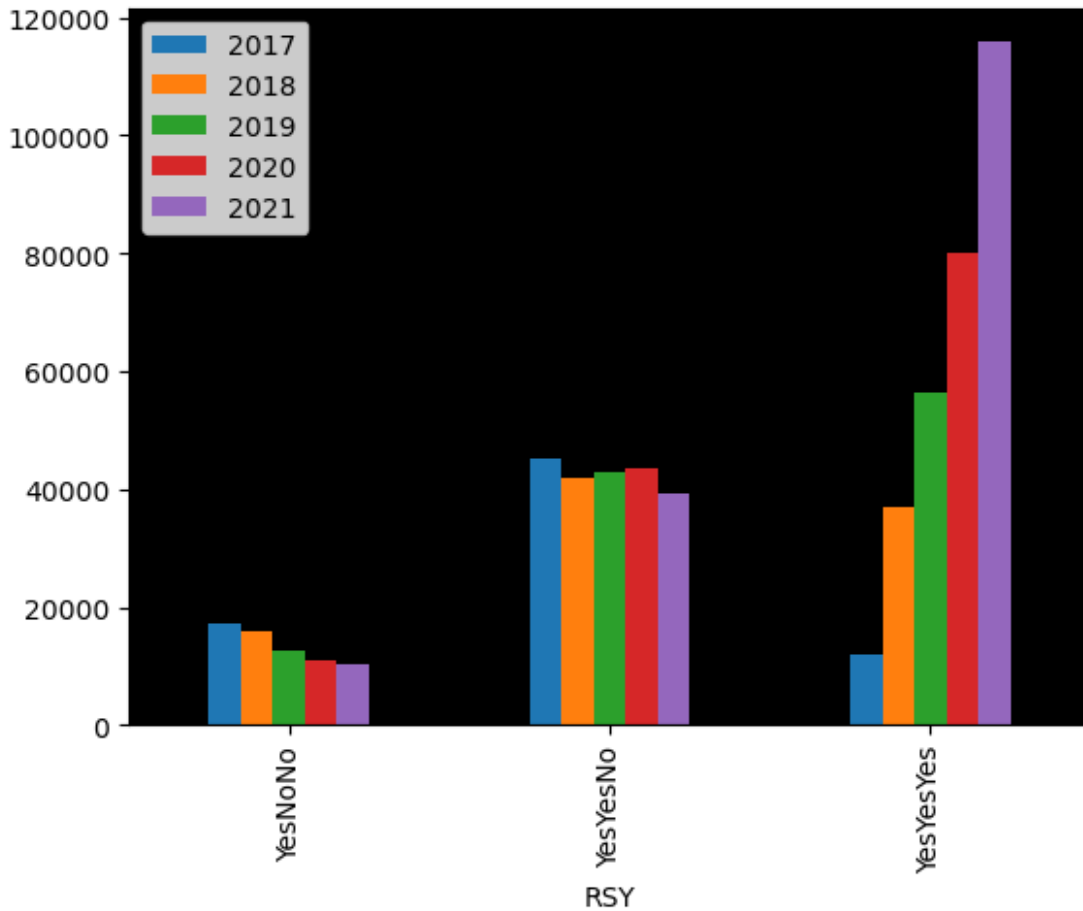
```
RSYGPSUM
```

| | 2017 | 2018 | 2019 | 2020 | 2021 | RSYVALUECOUNT |
|------------------|-------|-------|-------|-------|--------|---------------|
| RSYGPSUM_5_YEARS | | | | | | |
| RSY | | | | | | |
| YesNoNo | 17121 | 15770 | 12567 | 10968 | 10428 | 3 |
| 66857 | | | | | | |
| YesYesNo | 45259 | 41802 | 42896 | 43557 | 39415 | 8 |
| 212937 | | | | | | |
| YesYesYes | 12027 | 36904 | 56400 | 80155 | 115808 | 13 |
| 301307 | | | | | | |

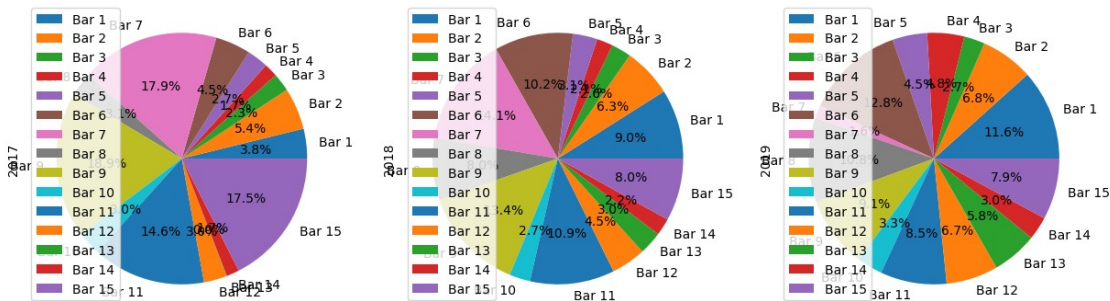
```
ax = RSYGPSUM.plot(kind="bar")
ax.set_facecolor("darkgray")
plt.show()
```



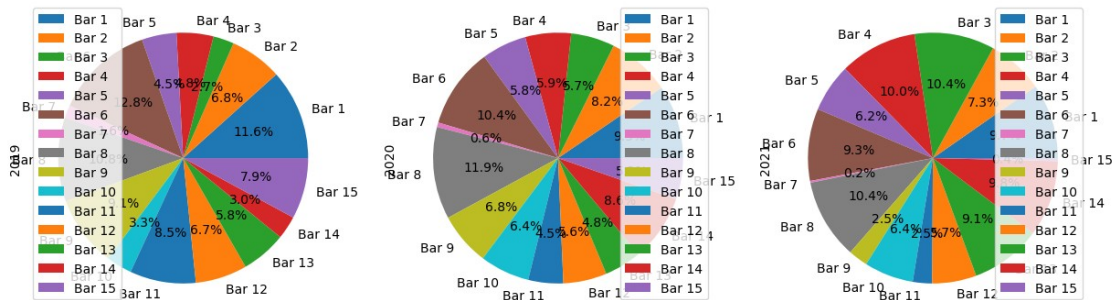
```
ax = RSYGPSUM.drop(RSYGPSUM.columns[[-2,-1]], axis =
1).plot(kind="bar")
ax.set_facecolor("black")
plt.show()
```



```
A[[2017,2018,2019]].plot( kind = 'pie', subplots=True, figsize =
(15,6),autopct = '%1.1f%%')
plt.show()
```



```
A[[2019,2020,2021]].plot( kind = 'pie', subplots=True, figsize =
(15,6),autopct = '%1.1f%%')
plt.show()
```



Interpretation:

Over the years all the flavors of red bull are consumed by customers

A.corr()

| | 2017 | 2018 | 2019 |
|---------------------------------------|-----------|-----------|----------|
| 2020 \ | | | |
| 2017 | 1.000000 | 0.810236 | 0.093831 |
| 0.447287 | | | |
| 2018 | 0.810236 | 1.000000 | 0.458668 |
| 0.107749 | | | |
| 2019 | 0.093831 | 0.458668 | 1.000000 |
| 0.656953 | | | |
| 2020 | -0.447287 | -0.107749 | 0.656953 |
| 1.000000 | | | |
| 2021 | -0.898298 | -0.609914 | 0.115640 |
| 0.649238 | | | |
| Total_Sales Quantity/Bar/Account Name | 0.281118 | 0.658811 | 0.884787 |
| 0.640091 | | | |

| | 2021 \ |
|---------------------------------------|-----------|
| 2017 | -0.898298 |
| 2018 | -0.609914 |
| 2019 | 0.115640 |
| 2020 | 0.649238 |
| 2021 | 1.000000 |
| Total_Sales Quantity/Bar/Account Name | 0.061649 |

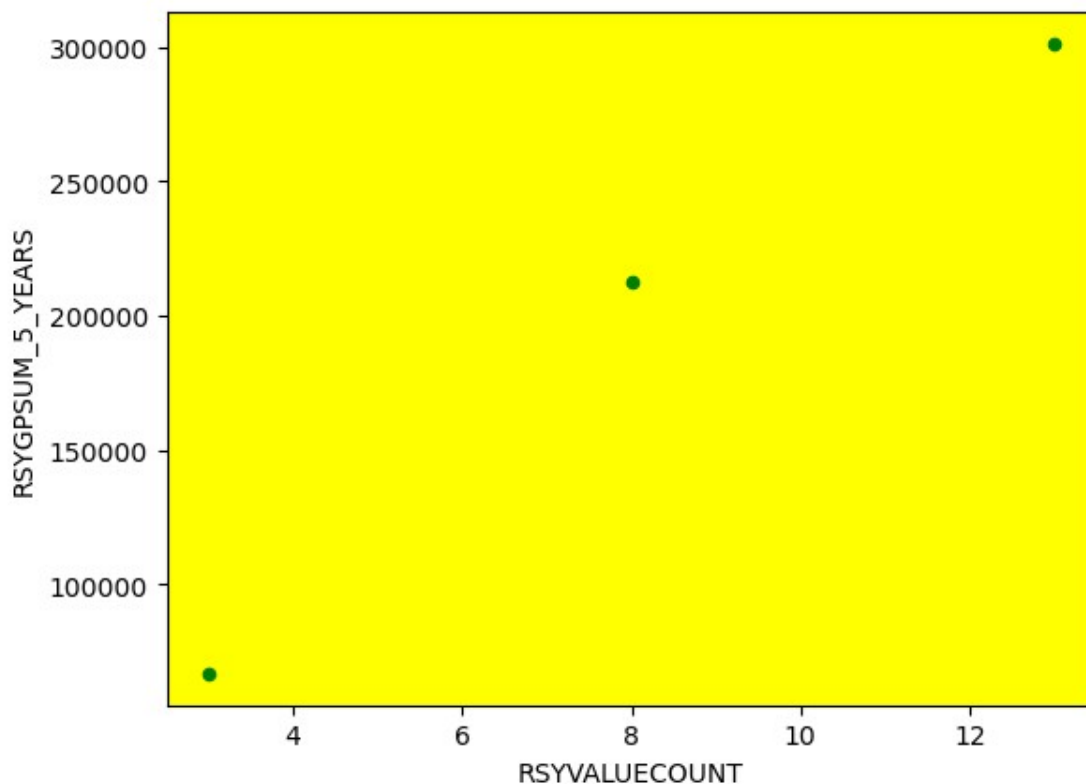
| | Total_Sales |
|---------------------------|-------------|
| Quantity/Bar/Account Name | |
| 2017 | 0.281118 |
| 2018 | 0.658811 |
| 2019 | 0.884787 |
| 2020 | 0.640091 |

2021
0.061649
Total_Sales Quantity/Bar/Account Name
1.000000

```
RSYGPSUM[['RSYVALUECOUNT', 'RSYGPSUM_5_YEARS']].corr()
```

| | RSYVALUECOUNT | RSYGPSUM_5_YEARS |
|------------------|---------------|------------------|
| RSYVALUECOUNT | 1.000000 | 0.990052 |
| RSYGPSUM_5_YEARS | 0.990052 | 1.000000 |

```
ax = RSYGPSUM.plot.scatter(x='RSYVALUECOUNT',  
y='RSYGPSUM_5_YEARS',color="green");  
ax.set_facecolor("yellow")  
#plt.xlabel('name')  
#plt.ylabel('name')  
#plt.title('title')  
plt.show()
```



Interpretation:

There is a strong correlation between the number of decision makers and the number of orders

```
from IPython import display
display.Image("https://e0.365dm.com/16/05/1600x900/bradley-wright-phillips_3470989.jpg", width = 1200, height = 300)
```

