dsbda1

April 28, 2025

```python
[1]: import pandas as pd
     import numpy as np
```

```python
[2]: dataset = pd.read_csv("dataset_Facebook - dataset_Facebook.csv")
     dataset
```

```
[2]:      Page total likes    Type  Category  Post Month  Post Weekday  Post Hour  \
     0              139441   Photo         2          12             4          3
     1              139441  Status         2          12             3         10
     2              139441   Photo         3          12             3          3
     3              139441   Photo         2          12             2         10
     4              139441   Photo         2          12             2          3
     ..                ...     ...       ...         ...           ...        ...
     495             85093   Photo         3           1             7          2
     496             81370   Photo         2           1             5          8
     497             81370   Photo         1           1             5          2
     498             81370   Photo         3           1             4         11
     499             81370   Photo         2           1             4          4

          Paid  Lifetime Post Total Reach  Lifetime Post Total Impressions  \
     0     0.0                       2752                             5091
     1     0.0                      10460                            19057
     2     0.0                       2413                             4373
     3     1.0                      50128                            87991
     4     0.0                       7244                            13594
     ..    ...                        ...                              ...
     495   0.0                       4684                             7536
     496   0.0                       3480                             6229
     497   0.0                       3778                             7216
     498   0.0                       4156                             7564
     499   NaN                       4188                             7292

          Lifetime Engaged Users  Lifetime Post Consumers  \
     0                       178                      109
     1                      1457                     1361
     2                       177                      113
     3                      2211                      790
```

1

```
4                              671                          410
..                             …                            …
495                            733                          708
496                            537                          508
497                            625                          572
498                            626                          574
499                            564                          524


        Lifetime Post Consumptions  \
0                               159
1                              1674
2                               154
3                              1119
4                               580
..                              …
495                             985
496                             687
497                             795
498                             832
499                             743


        Lifetime Post Impressions by people who have liked your Page  \
0                                                          3078
1                                                         11710
2                                                          2812
3                                                         61027
4                                                          6228
..                                                          …
495                                                        4750
496                                                        3961
497                                                        4742
498                                                        4534
499                                                        3861


        Lifetime Post reach by people who like your Page  \
0                                                      1640
1                                                      6112
2                                                      1503
3                                                     32048
4                                                      3200
..                                                      …
495                                                    2876
496                                                    2104
497                                                    2388
498                                                    2452
499                                                    2200
```

```
       Lifetime People who have liked your Page and engaged with your post  \
0                                                       119
1                                                      1108
2                                                       132
3                                                      1386
4                                                       396
..                                                      ...
495                                                     392
496                                                     301
497                                                     363
498                                                     370
499                                                     316

       comment    like   share  Total Interactions
0            4    79.0    17.0                 100
1            5   130.0    29.0                 164
2            0    66.0    14.0                  80
3           58  1572.0   147.0                1777
4           19   325.0    49.0                 393
..         ...     ...     ...                 ...
495          5    53.0    26.0                  84
496          0    53.0    22.0                  75
497          4    93.0    18.0                 115
498          7    91.0    38.0                 136
499          0    91.0    28.0                 119

[500 rows x 19 columns]
```

[3]: `dataset.shape`

[3]: (500, 19)

[4]: `dataset.isnull().sum()`

[4]:
```
Page total likes                                                 0
Type                                                             0
Category                                                         0
Post Month                                                       0
Post Weekday                                                     0
Post Hour                                                        0
Paid                                                             1
Lifetime Post Total Reach                                        0
Lifetime Post Total Impressions                                  0
Lifetime Engaged Users                                           0
Lifetime Post Consumers                                          0
Lifetime Post Consumptions                                       0
Lifetime Post Impressions by people who have liked your Page     0
```

```
Lifetime Post reach by people who like your Page                          0
Lifetime People who have liked your Page and engaged with your post       0
comment                                                                   0
like                                                                      1
share                                                                     4
Total Interactions                                                        0
dtype: int64
```

[5]: `dataset = dataset.dropna()`

[6]: `dataset.isnull().sum()`

[6]:
```
Page total likes                                                          0
Type                                                                      0
Category                                                                  0
Post Month                                                                0
Post Weekday                                                              0
Post Hour                                                                 0
Paid                                                                      0
Lifetime Post Total Reach                                                 0
Lifetime Post Total Impressions                                           0
Lifetime Engaged Users                                                    0
Lifetime Post Consumers                                                   0
Lifetime Post Consumptions                                                0
Lifetime Post Impressions by people who have liked your Page              0
Lifetime Post reach by people who like your Page                          0
Lifetime People who have liked your Page and engaged with your post       0
comment                                                                   0
like                                                                      0
share                                                                     0
Total Interactions                                                        0
dtype: int64
```

[7]: `sub1 = dataset[dataset['Page total likes']>= 100000]`

[8]: `sub1`

[8]:
```
     Page total likes     Type  Category  Post Month  Post Weekday  Post Hour  \
0              139441    Photo         2          12             4          3
1              139441   Status         2          12             3         10
2              139441    Photo         3          12             3          3
3              139441    Photo         2          12             2         10
4              139441    Photo         2          12             2          3
..                ...      ...       ...         ...           ...        ...
433            100732    Photo         1           3             6         17
434            100732    Photo         1           3             6         15
435            100732    Photo         1           3             6         15
```

```
436              100732   Photo         1         3            6           13
437              100732   Photo         1         3            6           10

        Paid  Lifetime Post Total Reach  Lifetime Post Total Impressions  \
0        0.0                      2752                              5091
1        0.0                     10460                             19057
2        0.0                      2413                              4373
3        1.0                     50128                             87991
4        0.0                      7244                             13594
..       …                        …                                 …
433      0.0                     11420                             23855
434      0.0                      5704                             10510
435      0.0                      7192                             12811
436      1.0                      9604                             16557
437      0.0                    122944                            457509

        Lifetime Engaged Users  Lifetime Post Consumers  \
0                          178                      109
1                         1457                     1361
2                          177                      113
3                         2211                      790
4                          671                      410
..                          …                        …
433                       1411                     1342
434                        452                      450
435                        587                      554
436                       1061                     1037
437                       1373                     1268

        Lifetime Post Consumptions  \
0                              159
1                             1674
2                              154
3                             1119
4                              580
..                              …
433                           8049
434                           2895
435                           3941
436                           9614
437                           2106

        Lifetime Post Impressions by people who have liked your Page  \
0                                                     3078
1                                                    11710
2                                                     2812
3                                                    61027
```

```
4                                                                 6228
..                                                                 …
433                                                               16634
434                                                                9348
435                                                               11519
436                                                               13618
437                                                               72846

     Lifetime Post reach by people who like your Page  \
0                                                1640
1                                                6112
2                                                1503
3                                               32048
4                                                3200
..                                                …
433                                              8032
434                                              5388
435                                              6616
436                                              7984
437                                             13184

     Lifetime People who have liked your Page and engaged with your post  \
0                                                 119
1                                                1108
2                                                 132
3                                                1386
4                                                 396
..                                                …
433                                               865
434                                               361
435                                               472
436                                               705
437                                               475

     comment    like   share  Total Interactions
0          4    79.0    17.0                 100
1          5   130.0    29.0                 164
2          0    66.0    14.0                  80
3         58  1572.0   147.0                1777
4         19   325.0    49.0                 393
..        …       …       …                   …
433       12   211.0    14.0                 237
434        1    15.0     1.0                  17
435       11    95.0     4.0                 110
436       16   127.0     0.0                 143
437        0   136.0    13.0                 149
```

```
[434 rows x 19 columns]
```

```
[9]:  sub2 = dataset[dataset['Type']=='Photo']
```

```
[10]:  sub2
```

```
[10]:        Page total likes    Type  Category  Post Month  Post Weekday  Post Hour  \
       0              139441  Photo         2          12             4          3
       2              139441  Photo         3          12             3          3
       3              139441  Photo         2          12             2         10
       4              139441  Photo         2          12             2          3
       6              139441  Photo         3          12             1          3
       ..                ...    ...       ...         ...           ...        ...
       494             85093  Photo         3           1             7         10
       495             85093  Photo         3           1             7          2
       496             81370  Photo         2           1             5          8
       497             81370  Photo         1           1             5          2
       498             81370  Photo         3           1             4         11

            Paid  Lifetime Post Total Reach  Lifetime Post Total Impressions  \
       0     0.0                      2752                             5091
       2     0.0                      2413                             4373
       3     1.0                     50128                            87991
       4     0.0                      7244                            13594
       6     1.0                     11692                            19479
       ..    ...                       ...                              ...
       494   0.0                      5400                             9218
       495   0.0                      4684                             7536
       496   0.0                      3480                             6229
       497   0.0                      3778                             7216
       498   0.0                      4156                             7564

            Lifetime Engaged Users  Lifetime Post Consumers  \
       0                       178                      109
       2                       177                      113
       3                      2211                      790
       4                       671                      410
       6                       481                      265
       ..                      ...                      ...
       494                     810                      756
       495                     733                      708
       496                     537                      508
       497                     625                      572
       498                     626                      574

            Lifetime Post Consumptions  \
       0                           159
```

```
2                                    154
3                                   1119
4                                    580
6                                    364
..                                    …
494                                  1003
495                                   985
496                                   687
497                                   795
498                                   832


        Lifetime Post Impressions by people who have liked your Page  \
0                                              3078
2                                              2812
3                                             61027
4                                              6228
6                                             15432
..                                              …
494                                            5654
495                                            4750
496                                            3961
497                                            4742
498                                            4534


        Lifetime Post reach by people who like your Page  \
0                                            1640
2                                            1503
3                                           32048
4                                            3200
6                                            9328
..                                            …
494                                          3230
495                                          2876
496                                          2104
497                                          2388
498                                          2452


        Lifetime People who have liked your Page and engaged with your post  \
0                                                  119
2                                                  132
3                                                 1386
4                                                  396
6                                                  379
..                                                  …
494                                                422
495                                                392
496                                                301
```

```
497                                                          363
498                                                          370

       comment     like   share  Total Interactions
0            4     79.0    17.0                  100
2            0     66.0    14.0                   80
3           58   1572.0   147.0                 1777
4           19    325.0    49.0                  393
6            3    249.0    27.0                  279
..         ...      ...     ...                  ...
494         10    125.0    41.0                  176
495          5     53.0    26.0                   84
496          0     53.0    22.0                   75
497          4     93.0    18.0                  115
498          7     91.0    38.0                  136

[421 rows x 19 columns]
```

[11]: `sub3 = dataset[(dataset['Paid']==1) &( dataset['like'] > 150)]`

[12]: `sub3`

[12]:
```
       Page total likes     Type  Category  Post Month  Post Weekday  Post Hour  \
3                139441    Photo         2          12             2         10
6                139441    Photo         3          12             1          3
7                139441    Photo         3          12             7          9
14               138414    Photo         2          12             4          5
17               138414    Photo         1          12             2         12
41               138895     Link         1          12             6          3
51               138329    Photo         1          11             1          3
62               138185    Photo         1          11             2         10
63               138185    Photo         1          11             2          3
67               138185    Photo         1          11             7          3
71               137893    Video         1          11             5          3
73               137893    Photo         1          11             4          2
75               137893    Photo         1          11             3          2
98               137020   Status         2          10             5          3
142              136013   Status         2          10             3          2
143              136013    Photo         3          10             2         10
152              135713    Photo         2          10             5          4
167              135428    Photo         3           9             4          2
175              135195   Status         2           9             6         10
176              135195    Photo         3           9             6          3
182              134879    Photo         3           9             3          2
214              132201    Photo         3           8             4          3
223              131808   Status         2           8             6         10
226              131728    Photo         3           7             5          8
```

243	130791	Video	1	7	3	11
244	130791	Photo	2	7	3	5
253	129600	Status	2	7	5	12
270	128032	Photo	2	7	4	5
271	128032	Photo	1	7	3	10
272	127082	Photo	1	7	3	3
278	126345	Photo	1	6	2	9
302	124940	Photo	1	6	5	13
303	124940	Photo	3	6	5	3
307	124940	Photo	3	6	3	3
319	123047	Photo	2	6	4	5
338	119198	Photo	3	5	5	10
345	117764	Photo	3	5	7	13
348	117764	Photo	3	5	6	8
351	116435	Photo	3	5	4	13
352	116435	Status	1	5	4	3
363	115893	Photo	3	4	4	15
369	113028	Photo	2	4	7	3
371	113028	Status	2	4	6	3
375	111620	Photo	3	4	4	7
377	111620	Photo	3	4	2	13
378	111620	Photo	1	4	2	6
379	111620	Photo	3	4	1	14
391	109670	Photo	2	4	1	13
401	107907	Photo	1	4	3	13
414	104070	Photo	1	3	4	14
446	96749	Photo	1	3	1	2
449	93684	Photo	1	2	6	13
462	92293	Photo	3	2	7	13
467	91758	Photo	2	2	5	3
476	86909	Photo	1	1	6	10

	Paid	Lifetime Post Total Reach	Lifetime Post Total Impressions \
3	1.0	50128	87991
6	1.0	11692	19479
7	1.0	13720	24137
14	1.0	22784	39941
17	1.0	53264	111785
41	1.0	18480	28438
51	1.0	25248	40125
62	1.0	28752	47358
63	1.0	27216	81908
67	1.0	53456	93790
71	1.0	100768	220447
73	1.0	11444	46054
75	1.0	37376	68610
98	1.0	12468	24917

142	1.0	31136	59964
143	1.0	16776	39549
152	1.0	6564	12097
167	1.0	10748	19724
175	1.0	13216	24738
176	1.0	22304	37159
182	1.0	4260	7989
214	1.0	12728	21685
223	1.0	20168	35904
226	1.0	3414	6369
243	1.0	21872	40413
244	1.0	180480	319133
253	1.0	15576	27513
270	1.0	53056	65260
271	1.0	66976	111502
272	1.0	76096	94644
278	1.0	5854	11854
302	1.0	63840	102620
303	1.0	11608	15323
307	1.0	4644	8178
319	1.0	11304	20647
338	1.0	6460	11373
345	1.0	4362	7378
348	1.0	4336	7705
351	1.0	5490	9518
352	1.0	23832	42313
363	1.0	5212	9035
369	1.0	5582	9903
371	1.0	17912	34774
375	1.0	12824	18929
377	1.0	7492	12414
378	1.0	44288	60918
379	1.0	105632	147918
391	1.0	32208	55696
401	1.0	46192	80227
414	1.0	6030	9579
446	1.0	98816	125026
449	1.0	27056	162816
462	1.0	10040	17029
467	1.0	15880	51571
476	1.0	37088	10966

	Lifetime Engaged Users	Lifetime Post Consumers \
3	2211	790
6	481	265
7	537	232
14	887	337

17	1706	1103
41	517	366
51	726	467
62	802	654
63	541	335
67	1576	995
71	2101	1735
73	555	418
75	1150	808
98	2143	1966
142	6164	5934
143	714	440
152	806	602
167	892	498
175	2675	2584
176	1805	984
182	588	435
214	844	461
223	3370	3244
226	473	342
243	3872	3822
244	8072	4010
253	2417	2327
270	2003	1412
271	1191	1054
272	2889	2495
278	1043	947
302	1382	1229
303	985	705
307	768	683
319	1141	1065
338	823	706
345	604	509
348	574	484
351	647	555
352	1701	1570
363	736	642
369	708	620
371	2750	2567
375	830	623
377	838	713
378	1215	1105
379	3984	2254
391	1933	1367
401	1364	1096
414	735	659
446	11452	11328

449	2299	2127
462	1429	1346
467	1188	1071
476	2728	2288

	Lifetime Post Consumptions \
3	1119
6	364
7	305
14	417
17	1655
41	460
51	863
62	1268
63	540
67	1469
71	2331
73	717
75	1341
98	2576
142	9237
143	720
152	957
167	719
175	2969
176	1618
182	622
214	683
223	5106
226	525
243	7327
244	6242
253	3098
270	2089
271	1641
272	4596
278	19779
302	1871
303	940
307	1000
319	1874
338	1197
345	767
348	847
351	847
352	2838
363	1005

```
369                     923
371                    6591
375                     864
377                    1274
378                    1746
379                    3391
391                    2123
401                    1697
414                    1448
446                   18115
449                    2737
462                    2022
467                    1410
476                    3183


     Lifetime Post Impressions by people who have liked your Page  \
3                                                      61027
6                                                      15432
7                                                      19728
14                                                     34415
17                                                     92512
41                                                     12078
51                                                     16132
62                                                     14091
63                                                     26869
67                                                     32646
71                                                     59658
73                                                     13737
75                                                     22100
98                                                     15850
142                                                    35977
143                                                    11860
152                                                     7682
167                                                    13674
175                                                    19599
176                                                    22864
182                                                     4578
214                                                    15779
223                                                    26881
226                                                     4518
243                                                    24667
244                                                   108752
253                                                    19078
270                                                    23679
271                                                    40203
272                                                    31096
278                                                     5901
```

```
302                                              32470
303                                               8419
307                                               5651
319                                              14792
338                                               6279
345                                               5681
348                                               5156
351                                               6549
352                                              37816
363                                               6258
369                                               6315
371                                              21009
375                                              15678
377                                               8452
378                                              22130
379                                              48575
391                                              43980
401                                              32842
414                                               6956
446                                              16682
449                                             160270
462                                              11744
467                                              47976
476                                              66311


     Lifetime Post reach by people who like your Page  \
3                                                32048
6                                                 9328
7                                                11056
14                                               19312
17                                               39776
41                                                6752
51                                                8608
62                                                7456
63                                                7760
67                                               14912
71                                               18880
73                                                4320
75                                               10880
98                                                7636
142                                              18048
143                                               6200
152                                               4024
167                                               7624
175                                              10232
176                                              13304
182                                               2432
```

214	8844
223	15056
226	2390
243	12920
244	51456
253	10840
270	17104
271	19968
272	19744
278	2894
302	16480
303	5840
307	3144
319	7800
338	3612
345	3216
348	2752
351	3716
352	21352
363	3608
369	3422
371	11408
375	10968
377	5024
378	14224
379	27328
391	24720
401	16960
414	4418
446	10336
449	25424
462	6964
467	13560
476	34352

	Lifetime People who have liked your Page and engaged with your post \
3	1386
6	379
7	422
14	684
17	1307
41	319
51	451
62	408
63	315
67	884
71	885

73	438
75	724
98	1661
142	4376
143	590
152	563
167	704
175	2342
176	1349
182	436
214	657
223	2806
226	360
243	2218
244	3316
253	1839
270	975
271	708
272	1276
278	583
302	760
303	594
307	506
319	732
338	505
345	469
348	403
351	476
352	1578
363	597
369	557
371	2256
375	705
377	670
378	814
379	1936
391	1568
401	762
414	572
446	1356
449	1146
462	742
467	677
476	2021

	comment	like	share	Total Interactions
3	58	1572.0	147.0	1777

6	3	249.0	27.0	279
7	0	325.0	14.0	339
14	2	577.0	20.0	599
17	15	678.0	20.0	713
41	6	187.0	18.0	211
51	24	285.0	28.0	337
62	10	179.0	13.0	202
63	4	219.0	22.0	245
67	20	697.0	70.0	787
71	17	449.0	84.0	550
73	14	172.0	47.0	233
75	20	411.0	74.0	505
98	7	310.0	61.0	378
142	60	859.0	90.0	1009
143	10	377.0	60.0	447
152	47	358.0	49.0	454
167	8	485.0	64.0	557
175	2	165.0	22.0	189
176	29	1047.0	98.0	1174
182	1	226.0	44.0	271
214	4	435.0	31.0	470
223	18	332.0	54.0	404
226	3	188.0	26.0	217
243	18	315.0	76.0	409
244	372	5172.0	790.0	6334
253	11	238.0	51.0	300
270	6	696.0	28.0	730
271	7	215.0	47.0	269
272	22	534.0	31.0	587
278	11	202.0	5.0	218
302	9	197.0	28.0	234
303	4	330.0	29.0	363
307	4	154.0	26.0	184
319	18	168.0	49.0	235
338	25	244.0	44.0	313
345	3	156.0	20.0	179
348	12	155.0	23.0	190
351	4	166.0	33.0	203
352	6	210.0	39.0	255
363	1	179.0	30.0	210
369	2	163.0	35.0	200
371	17	447.0	123.0	587
375	0	286.0	30.0	316
377	8	236.0	51.0	295
378	2	152.0	11.0	165
379	51	1998.0	128.0	2177
391	6	766.0	109.0	881

```
401         9   329.0   38.0              376
414         3   176.0   29.0              208
446        10   197.0   21.0              228
449         6   234.0   26.0              266
462        19   214.0   78.0              311
467         1   200.0   37.0              238
476         7   579.0   47.0              633
```

[13]: `sub4 = dataset[(dataset['Paid']==1) &( dataset['Type'] == 'Video')]`

[14]: `sub4`

[14]:
```
     Page total likes    Type  Category  Post Month  Post Weekday  Post Hour  \
29              138895  Video         1          12             4         11
55              138329  Video         1          11             6          2
71              137893  Video         1          11             5          3
243             130791  Video         1           7             3         11

     Paid  Lifetime Post Total Reach  Lifetime Post Total Impressions  \
29    1.0                      36208                            61262
55    1.0                      16416                            31950
71    1.0                     100768                           220447
243   1.0                      21872                            40413

     Lifetime Engaged Users  Lifetime Post Consumers  \
29                     1141                     1068
55                      459                      411
71                     2101                     1735
243                    3872                     3822

     Lifetime Post Consumptions  \
29                         1728
55                          539
71                         2331
243                        7327

     Lifetime Post Impressions by people who have liked your Page  \
29                                                30131
55                                                21436
71                                                59658
243                                               24667

     Lifetime Post reach by people who like your Page  \
29                                             14112
55                                              9568
71                                             18880
243                                            12920
```

```
        Lifetime People who have liked your Page and engaged with your post  \
29                                                     559
55                                                     363
71                                                     885
243                                                   2218


        comment   like   share   Total Interactions
29           18   143.0    13.0                  174
55            2    65.0    14.0                   81
71           17   449.0    84.0                  550
243          18   315.0    76.0                  409
```

[15]: `sub5 = dataset[(dataset['comment']>50) &( dataset['share'] >50)]`

[16]: `sub5`

[16]:
```
        Page total likes     Type   Category   Post Month   Post Weekday   Post Hour  \
3                  139441    Photo          2           12              2          10
142                136013   Status          2           10              3           2
168                135428    Photo          1            9              3          10
244                130791    Photo          2            7              3           5
379                111620    Photo          3            4              1          14
460                 92507    Photo          3            2              1          13
480                 86909    Photo          2            1              4          11


        Paid   Lifetime Post Total Reach   Lifetime Post Total Impressions  \
3       1.0                        50128                             87991
142     1.0                        31136                             59964
168     0.0                        41984                             68290
244     1.0                       180480                            319133
379     1.0                       105632                            147918
460     0.0                        55520                            665792
480     0.0                        11484                             20696


        Lifetime Engaged Users   Lifetime Post Consumers  \
3                         2211                       790
142                       6164                      5934
168                       3370                      2420
244                       8072                      4010
379                       3984                      2254
460                       4544                      3586
480                       1762                      1635


        Lifetime Post Consumptions  \
3                             1119
142                           9237
```

```
168                       4074
244                       6242
379                       3391
460                       6624
480                       2741


        Lifetime Post Impressions by people who have liked your Page  \
3                                                    61027
142                                                  35977
168                                                  34802
244                                                 108752
379                                                  48575
460                                                 648611
480                                                   8774


        Lifetime Post reach by people who like your Page  \
3                                                  32048
142                                                18048
168                                                20928
244                                                51456
379                                                27328
460                                                47488
480                                                 5124


        Lifetime People who have liked your Page and engaged with your post  \
3                                                    1386
142                                                  4376
168                                                  2126
244                                                  3316
379                                                  1936
460                                                  3430
480                                                   722


        comment    like   share  Total Interactions
3            58  1572.0   147.0                1777
142          60   859.0    90.0                1009
168         144  1622.0   208.0                1974
244         372  5172.0   790.0                6334
379          51  1998.0   128.0                2177
460         146  1546.0   181.0                1873
480          56   360.0    99.0                 515
```

```
[17]: time = dataset.iloc[:,3:6]
```

```
[18]: time
```

```
[18]:        Post Month  Post Weekday  Post Hour
       0            12             4          3
       1            12             3         10
       2            12             3          3
       3            12             2         10
       4            12             2          3
       ..           ...           ...        ...
       494           1             7         10
       495           1             7          2
       496           1             5          8
       497           1             5          2
       498           1             4         11

       [495 rows x 3 columns]
```

```
[19]: dataset.iloc[:250,:]
```

```
[19]:        Page total likes      Type  Category  Post Month  Post Weekday  Post Hour  \
       0                139441     Photo         2          12             4          3
       1                139441    Status         2          12             3         10
       2                139441     Photo         3          12             3          3
       3                139441     Photo         2          12             2         10
       4                139441     Photo         2          12             2          3
       ..                  ...       ...       ...         ...           ...        ...
       249              129600     Photo         2           7             7         11
       250              129600     Photo         1           7             7          6
       251              129600     Photo         1           7             6         11
       252              129600     Photo         3           7             6          5
       253              129600    Status         2           7             5         12

            Paid  Lifetime Post Total Reach  Lifetime Post Total Impressions  \
       0     0.0                       2752                             5091
       1     0.0                      10460                            19057
       2     0.0                       2413                             4373
       3     1.0                      50128                            87991
       4     0.0                       7244                            13594
       ..    ...                        ...                              ...
       249   1.0                       2602                             4349
       250   1.0                       5848                             9068
       251   0.0                      26944                            43464
       252   0.0                       5292                             9321
       253   1.0                      15576                            27513

            Lifetime Engaged Users  Lifetime Post Consumers  \
       0                       178                      109
       1                      1457                     1361
       2                       177                      113
```

3	2211	790
4	671	410
..	…	…
249	479	444
250	622	570
251	877	740
252	756	646
253	2417	2327

	Lifetime Post Consumptions \
0	159
1	1674
2	154
3	1119
4	580
..	…
249	588
250	795
251	1097
252	1033
253	3098

	Lifetime Post Impressions by people who have liked your Page \
0	3078
1	11710
2	2812
3	61027
4	6228
..	…
249	3342
250	6651
251	20270
252	5867
253	19078

	Lifetime Post reach by people who like your Page \
0	1640
1	6112
2	1503
3	32048
4	3200
..	…
249	1946
250	4212
251	10208
252	3404
253	10840

```
     Lifetime People who have liked your Page and engaged with your post  \
0                                                   119
1                                                  1108
2                                                   132
3                                                  1386
4                                                   396
..                                                   …
249                                                 287
250                                                 383
251                                                 563
252                                                 516
253                                                1839


     comment    like  share  Total Interactions
0          4    79.0   17.0                 100
1          5   130.0   29.0                 164
2          0    66.0   14.0                  80
3         58  1572.0  147.0                1777
4         19   325.0   49.0                 393
..        …      …      …                   …
249        1    53.0   14.0                  68
250        4    71.0   10.0                  85
251        6   194.0   34.0                 234
252        6   226.0   42.0                 274
253       11   238.0   51.0                 300


[250 rows x 19 columns]
```

[20]: `merge = pd.merge(sub3,sub4,on="Paid")`

[21]: `merge`

```
[21]:      Page total likes_x Type_x  Category_x  Post Month_x  Post Weekday_x  \
0                   139441  Photo           2            12               2
1                   139441  Photo           2            12               2
2                   139441  Photo           2            12               2
3                   139441  Photo           2            12               2
4                   139441  Photo           3            12               1
..                       …      …           …             …               …
215                  91758  Photo           2             2               5
216                  86909  Photo           1             1               6
217                  86909  Photo           1             1               6
218                  86909  Photo           1             1               6
219                  86909  Photo           1             1               6


     Post Hour_x  Paid  Lifetime Post Total Reach_x  \
```

```
0          10    1.0                    50128
1          10    1.0                    50128
2          10    1.0                    50128
3          10    1.0                    50128
4           3    1.0                    11692
..         …     …                        …
215         3    1.0                    15880
216        10    1.0                    37088
217        10    1.0                    37088
218        10    1.0                    37088
219        10    1.0                    37088

     Lifetime Post Total Impressions_x  Lifetime Engaged Users_x  …  \
0                                87991                      2211  …
1                                87991                      2211  …
2                                87991                      2211  …
3                                87991                      2211  …
4                                19479                       481  …
..                                   …                         …  …  …
215                              51571                      1188  …
216                              10966                      2728  …
217                              10966                      2728  …
218                              10966                      2728  …
219                              10966                      2728  …

     Lifetime Engaged Users_y  Lifetime Post Consumers_y  \
0                        1141                       1068
1                         459                        411
2                        2101                       1735
3                        3872                       3822
4                        1141                       1068
..                          …                          …
215                      3872                       3822
216                      1141                       1068
217                       459                        411
218                      2101                       1735
219                      3872                       3822

     Lifetime Post Consumptions_y  \
0                            1728
1                             539
2                            2331
3                            7327
4                            1728
..                              …
215                          7327
216                          1728
```

```
217                                  539
218                                 2331
219                                 7327


        Lifetime Post Impressions by people who have liked your Page_y  \
0                                               30131
1                                               21436
2                                               59658
3                                               24667
4                                               30131
..                                                  …
215                                             24667
216                                             30131
217                                             21436
218                                             59658
219                                             24667


        Lifetime Post reach by people who like your Page_y  \
0                                               14112
1                                                9568
2                                               18880
3                                               12920
4                                               14112
..                                                  …
215                                             12920
216                                             14112
217                                              9568
218                                             18880
219                                             12920


        Lifetime People who have liked your Page and engaged with your post_y  \
0                                                 559
1                                                 363
2                                                 885
3                                                2218
4                                                 559
..                                                  …
215                                              2218
216                                               559
217                                               363
218                                               885
219                                              2218


      comment_y  like_y  share_y  Total Interactions_y
0            18   143.0     13.0                   174
1             2    65.0     14.0                    81
2            17   449.0     84.0                   550
```

```
3          18   315.0    76.0                    409
4          18   143.0    13.0                    174
..         ...    ...     ...                    ...
215        18   315.0    76.0                    409
216        18   143.0    13.0                    174
217         2    65.0    14.0                     81
218        17   449.0    84.0                    550
219        18   315.0    76.0                    409

[220 rows x 37 columns]
```

[22]: `dataset.sort_values("Page total likes",ascending = True)`

[22]:

	Page total likes	Type	Category	Post Month	Post Weekday	Post Hour \
498	81370	Photo	3	1	4	11
497	81370	Photo	1	1	5	2
496	81370	Photo	2	1	5	8
493	85093	Photo	3	1	1	2
495	85093	Photo	3	1	7	2
..	...	...	...	...	...	...
10	139441	Status	2	12	5	10
11	139441	Photo	2	12	5	10
13	139441	Photo	2	12	5	3
7	139441	Photo	3	12	7	9
0	139441	Photo	2	12	4	3

	Paid	Lifetime Post Total Reach	Lifetime Post Total Impressions \
498	0.0	4156	7564
497	0.0	3778	7216
496	0.0	3480	6229
493	0.0	8412	13960
495	0.0	4684	7536
..	...	...	...
10	0.0	21744	42334
11	0.0	3112	5590
13	0.0	2549	4896
7	1.0	13720	24137
0	0.0	2752	5091

	Lifetime Engaged Users	Lifetime Post Consumers \
498	626	574
497	625	572
496	537	508
493	1179	1111
495	733	708
..	...	...
10	4258	4100

11	208	127
13	249	134
7	537	232
0	178	109

	Lifetime Post Consumptions \
498	832
497	795
496	687
493	1632
495	985
..	…
10	4540
11	145
13	168
7	305
0	159

	Lifetime Post Impressions by people who have liked your Page \
498	4534
497	4742
496	3961
493	8632
495	4750
..	…
10	37849
11	3887
13	3631
7	19728
0	3078

	Lifetime Post reach by people who like your Page \
498	2452
497	2388
496	2104
493	5348
495	2876
..	…
10	18952
11	2174
13	1917
7	11056
0	1640

	Lifetime People who have liked your Page and engaged with your post \
498	370
497	363

```
496                                                             301
493                                                             699
495                                                             392
..                                                              …
10                                                             3798
11                                                              165
13                                                              183
7                                                               422
0                                                               119

      comment    like   share  Total Interactions
498          7    91.0    38.0                 136
497          4    93.0    18.0                 115
496          0    53.0    22.0                  75
493         17   185.0    55.0                 257
495          5    53.0    26.0                  84
..         …      …       …                     …
10           0   233.0    19.0                 252
11           0    88.0    18.0                 106
13           5   137.0    10.0                 152
7            0   325.0    14.0                 339
0            4    79.0    17.0                 100

[495 rows x 19 columns]
```

[23]: `subset = dataset`

[24]:
```python
pivot = pd.pivot_table(dataset,index='Post Month',columns = 'Category',values =
  'like',aggfunc = "sum")
```

[25]: `pivot`

[25]:
```
Category           1        2        3
Post Month
1              918.0    482.0   1581.0
2             1547.0    376.0   3094.0
3             2118.0     80.0    794.0
4             2708.0   1656.0   4773.0
5              773.0   1263.0   5962.0
6             1969.0   1198.0   3380.0
7             2602.0   8432.0   3137.0
8             1755.0   1469.0   3523.0
9             2651.0   2725.0   2920.0
10            2936.0   4701.0   1593.0
11            5082.0    392.0   1478.0
12            1640.0   5567.0   1402.0
```

```
[26]: pivot_T = pivot.T
```

```
[27]: pivot_T
```

```
[27]: Post Month      1       2       3       4       5       6       7       8     \
      Category
      1            918.0  1547.0  2118.0  2708.0   773.0  1969.0  2602.0  1755.0
      2            482.0   376.0    80.0  1656.0  1263.0  1198.0  8432.0  1469.0
      3           1581.0  3094.0   794.0  4773.0  5962.0  3380.0  3137.0  3523.0

      Post Month      9      10      11      12
      Category
      1           2651.0  2936.0  5082.0  1640.0
      2           2725.0  4701.0   392.0  5567.0
      3           2920.0  1593.0  1478.0  1402.0
```

```
[28]: data = dataset.T
      data
```

```
[28]:                                                      0       1       2     \
      Page total likes                                  139441  139441  139441
      Type                                               Photo  Status   Photo
      Category                                               2       2       3
      Post Month                                            12      12      12
      Post Weekday                                           4       3       3
      Post Hour                                              3      10       3
      Paid                                                 0.0     0.0     0.0
      Lifetime Post Total Reach                           2752   10460    2413
      Lifetime Post Total Impressions                     5091   19057    4373
      Lifetime Engaged Users                               178    1457     177
      Lifetime Post Consumers                              109    1361     113
      Lifetime Post Consumptions                           159    1674     154
      Lifetime Post Impressions by people who have li…    3078   11710    2812
      Lifetime Post reach by people who like your Page    1640    6112    1503
      Lifetime People who have liked your Page and en…     119    1108     132
      comment                                                4       5       0
      like                                                79.0   130.0    66.0
      share                                               17.0    29.0    14.0
      Total Interactions                                   100     164      80

                                                           3       4       5     \
      Page total likes                                  139441  139441  139441
      Type                                               Photo   Photo  Status
      Category                                               2       2       2
      Post Month                                            12      12      12
      Post Weekday                                           2       2       1
      Post Hour                                             10       3       9
```

Paid	1.0	0.0	0.0
Lifetime Post Total Reach	50128	7244	10472
Lifetime Post Total Impressions	87991	13594	20849
Lifetime Engaged Users	2211	671	1191
Lifetime Post Consumers	790	410	1073
Lifetime Post Consumptions	1119	580	1389
Lifetime Post Impressions by people who have li…	61027	6228	16034
Lifetime Post reach by people who like your Page	32048	3200	7852
Lifetime People who have liked your Page and en…	1386	396	1016
comment	58	19	1
like	1572.0	325.0	152.0
share	147.0	49.0	33.0
Total Interactions	1777	393	186

	6	7	8	\
Page total likes	139441	139441	139441	
Type	Photo	Photo	Status	
Category	3	3	2	
Post Month	12	12	12	
Post Weekday	1	7	7	
Post Hour	3	9	3	
Paid	1.0	1.0	0.0	
Lifetime Post Total Reach	11692	13720	11844	
Lifetime Post Total Impressions	19479	24137	22538	
Lifetime Engaged Users	481	537	1530	
Lifetime Post Consumers	265	232	1407	
Lifetime Post Consumptions	364	305	1692	
Lifetime Post Impressions by people who have li…	15432	19728	15220	
Lifetime Post reach by people who like your Page	9328	11056	7912	
Lifetime People who have liked your Page and en…	379	422	1250	
comment	3	0	0	
like	249.0	325.0	161.0	
share	27.0	14.0	31.0	
Total Interactions	279	339	192	

	9	…	489	490	\
Page total likes	139441	…	85979	85979	
Type	Photo	…	Photo	Photo	
Category	3	…	3	3	
Post Month	12	…	1	1	
Post Weekday	6	…	7	6	
Post Hour	10	…	2	11	
Paid	0.0	…	0.0	0.0	
Lifetime Post Total Reach	4694	…	4800	5280	
Lifetime Post Total Impressions	8668	…	7754	8703	
Lifetime Engaged Users	280	…	975	951	
Lifetime Post Consumers	183	…	938	911	

```
Lifetime Post Consumptions                               250   …    1278    1237
Lifetime Post Impressions by people who have li…        4309   …    4932    5757
Lifetime Post reach by people who like your Page        2324   …    2820    3300
Lifetime People who have liked your Page and en…         199   …     432     431
comment                                                    3   …       1       1
like                                                   113.0   …    74.0    79.0
share                                                   26.0   …    28.0    30.0
Total Interactions                                       142   …     103     110


                                                         491     492     493   \
Page total likes                                       85979   85979   85093
Type                                                   Photo    Link   Photo
Category                                                   3       1       3
Post Month                                                 1       1       1
Post Weekday                                               6       5       1
Post Hour                                                  3      11       2
Paid                                                     1.0     0.0     0.0
Lifetime Post Total Reach                               6184   45920    8412
Lifetime Post Total Impressions                       10228    5808   13960
Lifetime Engaged Users                                  956     753    1179
Lifetime Post Consumers                                 901     655    1111
Lifetime Post Consumptions                             1140     763    1632
Lifetime Post Impressions by people who have li…       6085   15766    8632
Lifetime Post reach by people who like your Page       3502   10720    5348
Lifetime People who have liked your Page and en…        437     220     699
comment                                                   1       0      17
like                                                   105.0   128.0   185.0
share                                                   46.0     9.0    55.0
Total Interactions                                      152     137     257


                                                         494     495     496   \
Page total likes                                       85093   85093   81370
Type                                                   Photo   Photo   Photo
Category                                                   3       3       2
Post Month                                                 1       1       1
Post Weekday                                               7       7       5
Post Hour                                                 10       2       8
Paid                                                     0.0     0.0     0.0
Lifetime Post Total Reach                               5400    4684    3480
Lifetime Post Total Impressions                         9218    7536    6229
Lifetime Engaged Users                                  810     733     537
Lifetime Post Consumers                                 756     708     508
Lifetime Post Consumptions                             1003     985     687
Lifetime Post Impressions by people who have li…       5654    4750    3961
Lifetime Post reach by people who like your Page       3230    2876    2104
Lifetime People who have liked your Page and en…        422     392     301
comment                                                  10       5       0
```

```
like                                                    125.0   53.0   53.0
share                                                    41.0    26.0   22.0
Total Interactions                                      176     84     75


                                                        497     498
Page total likes                                       81370   81370
Type                                                   Photo   Photo
Category                                               1       3
Post Month                                             1       1
Post Weekday                                           5       4
Post Hour                                              2       11
Paid                                                   0.0     0.0
Lifetime Post Total Reach                              3778    4156
Lifetime Post Total Impressions                        7216    7564
Lifetime Engaged Users                                 625     626
Lifetime Post Consumers                                572     574
Lifetime Post Consumptions                             795     832
Lifetime Post Impressions by people who have li…       4742    4534
Lifetime Post reach by people who like your Page       2388    2452
Lifetime People who have liked your Page and en…       363     370
comment                                                4       7
like                                                   93.0    91.0
share                                                  18.0    38.0
Total Interactions                                     115     136

[19 rows x 495 columns]
```

[29]:
```python
import matplotlib.pyplot as plt
import seaborn as sns
```

[30]:
```python
sns.pairplot(dataset)
```

[30]:
```
<seaborn.axisgrid.PairGrid at 0x7faa4ae3f670>
```
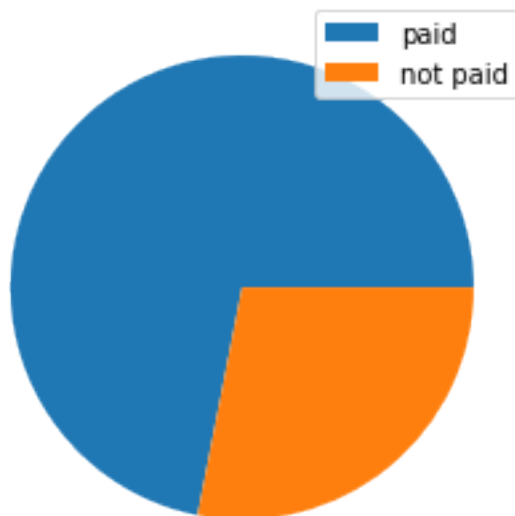
```
[31]: plt.barh(dataset['Post Month'],dataset['like'])
      plt.ylabel("Months")
      plt.xlabel("likes")
```

```
[31]: Text(0.5, 0, 'likes')
```
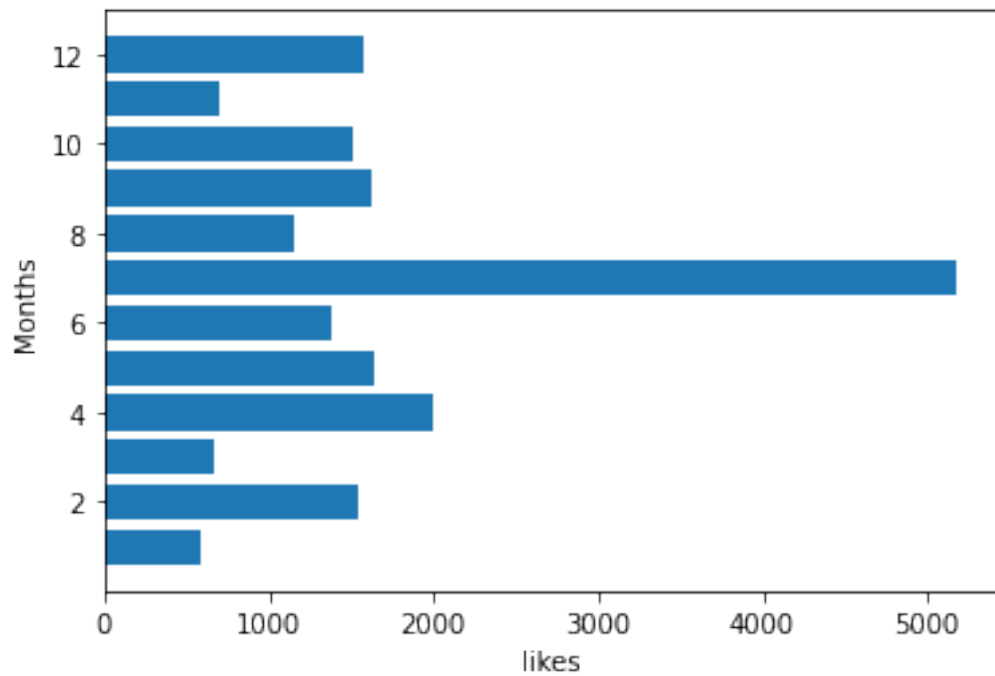
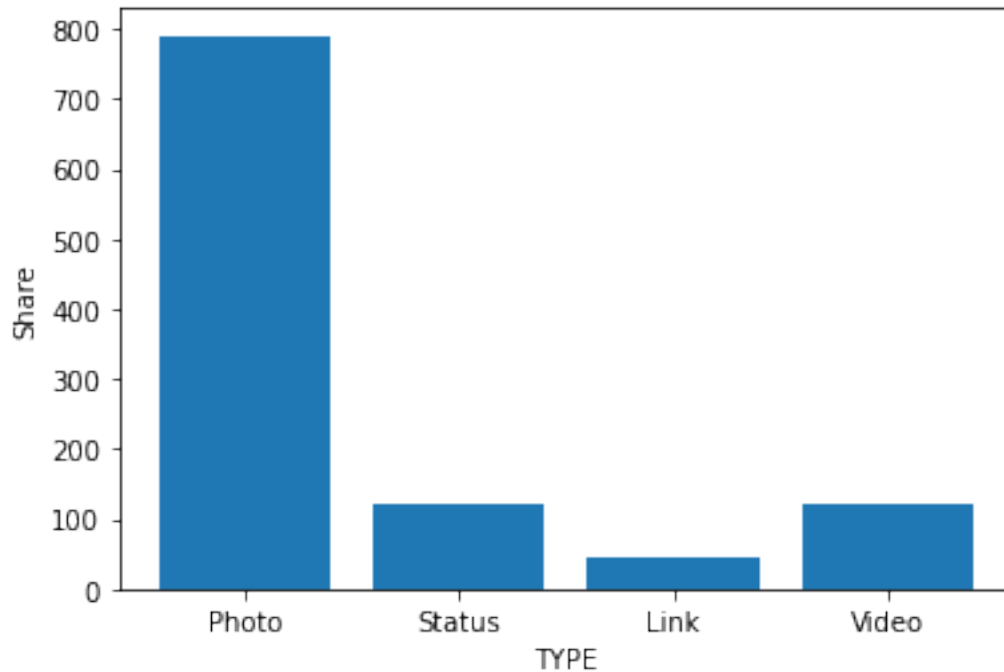```
[32]: plt.pie(dataset['Paid'].value_counts())
      label = ["paid","not paid"]
      plt.legend(label)
```

[32]: <matplotlib.legend.Legend at 0x7faa401fd4c0>

```
[33]: plt.bar(dataset['Type'],dataset['share'])
      plt.xlabel("TYPE")
      plt.ylabel("Share")
```

[33]: Text(0, 0.5, 'Share')


```
[35]: data_melt = pd.melt(dataset,id_vars = 'Category',value_vars = ['like','share'])
```

```
[36]: data_melt
```

[36]:

	Category	variable	value
0	2	like	79.0
1	2	like	130.0
2	3	like	66.0
3	2	like	1572.0
4	2	like	325.0
..	...	...	...
985	3	share	41.0
986	3	share	26.0
987	2	share	22.0
988	1	share	18.0
989	3	share	38.0

```
[990 rows x 3 columns]
```

[ ]: