In [ ]:
```
# Name :- Sarthak Pagar
# Roll No. :- 40
# Class :- TE(IT)
# Practical 4 :- Perform the following operations using Python on the Facebo
                 # b. Merge Data
                 # c. Sort Data
                 # d. Transposing Data
                 # e. Shape and reshape Data
```

In [12]:
```
# Importing required libraries
import pandas as pd
import numpy as np
```

In [13]:
```
# Import the data
df=pd.read_csv("Facebook Metrics of Cosmetic Brand.csv")
```

In [14]:
```
df.head()
```

Out[14]:

	Unnamed: 0	Page total likes	Type	Category	Post Month	Post Weekday	Post Hour	Paid	Lifetim Pos Tota Reac
0	0	139441	Photo	2	12	4	3	0.0	275
1	1	139441	Status	2	12	3	10	0.0	1046
2	2	139441	Photo	3	12	3	3	0.0	241
3	3	139441	Photo	2	12	2	10	1.0	5012
4	4	139441	Photo	2	12	2	3	0.0	724

In [15]:
```
df.shape
```

Out[15]:
```
(500, 20)
```

In [16]:
```
# Creating a subset by selecting specific columns by their name
subset_1=df[['Category','Post Month','Post Weekday','Post Hour','Paid']]
```

In [17]:
```
subset_1
```

Out[17]:

	Category	Post Month	Post Weekday	Post Hour	Paid
0	2	12	4	3	0.0
1	2	12	3	10	0.0
2	3	12	3	3	0.0
3	2	12	2	10	1.0
4	2	12	2	3	0.0
...	...	...	...	...	...
495	3	1	7	2	0.0
496	2	1	5	8	0.0
497	1	1	5	2	0.0
498	3	1	4	11	0.0
499	2	1	4	4	NaN

500 rows × 5 columns

In [20]:
```
# Creating a subset by filtering a row
subset_2=df[df['Total Interactions']>500.0]
```

In [21]:
```
subset_2
```

Out[21]:

	Unnamed: 0	Page total likes	Type	Category	Post Month	Post Weekday	Post Hour	Paid	Lifeti P To Re
3	3	139441	Photo	2	12	2	10	1.0	50
14	14	138414	Photo	2	12	4	5	1.0	22
17	17	138414	Photo	1	12	2	12	1.0	53
28	28	138895	Photo	2	12	5	3	0.0	9
67	67	138185	Photo	1	11	7	3	1.0	53
71	71	137893	Video	1	11	5	3	1.0	100
75	75	137893	Photo	1	11	3	2	1.0	37
101	101	137020	Photo	2	10	4	3	0.0	68
105	105	137020	Photo	1	10	2	4	0.0	70
142	142	136013	Status	2	10	3	2	1.0	31
167	167	135428	Photo	3	9	4	2	1.0	10
168	168	135428	Photo	1	9	3	10	0.0	41
176	176	135195	Photo	3	9	6	3	1.0	22
191	191	133679	Photo	3	8	1	10	0.0	19
199	199	132817	Photo	3	8	4	10	0.0	33
206	206	132201	Photo	1	8	1	3	0.0	50
240	240	130791	Photo	3	7	5	3	0.0	19
242	242	130791	Status	2	7	4	6	0.0	17
244	244	130791	Photo	2	7	3	5	1.0	180
254	254	129600	Photo	3	7	5	3	0.0	54
264	264	128032	Photo	3	7	7	3	0.0	38
270	270	128032	Photo	2	7	4	5	1.0	53
272	272	127082	Photo	1	7	3	3	1.0	76
288	288	126141	Photo	1	6	4	12	0.0	20
323	323	123047	Photo	3	6	1	10	0.0	56
328	328	120050	Photo	3	5	4	12	0.0	39
346	346	117764	Photo	3	5	7	2	0.0	38

	Unnamed: 0	Page total likes	Type	Category	Post Month	Post Weekday	Post Hour	Paid	Lifeti P To Re
349	349	117764	Photo	3	5	5	13	0.0	81
370	370	113028	Photo	1	4	6	14	0.0	28
371	371	113028	Status	2	4	6	3	1.0	17
379	379	111620	Photo	3	4	1	14	1.0	105
391	391	109670	Photo	2	4	1	13	1.0	32
442	442	98195	Photo	3	3	4	13	0.0	34
460	460	92507	Photo	3	2	1	13	0.0	55
476	476	86909	Photo	1	1	6	10	1.0	37
480	480	86909	Photo	2	1	4	11	0.0	11

In [22]:
```
subset_2.shape
```

Out[22]: (36, 20)

In [23]:
```
# Creating a subset by selecting specific rows and columns
subset_3=df.loc[df['Total Interactions']>500,['Type','Paid']]
```

In [24]:
```
subset_3
```

Out[24]:

	Type	Paid
3	Photo	1.0
14	Photo	1.0
17	Photo	1.0
28	Photo	0.0
67	Photo	1.0
71	Video	1.0
75	Photo	1.0
101	Photo	0.0
105	Photo	0.0
142	Status	1.0
167	Photo	1.0
168	Photo	0.0
176	Photo	1.0
191	Photo	0.0
199	Photo	0.0
206	Photo	0.0
240	Photo	0.0
242	Status	0.0
244	Photo	1.0
254	Photo	0.0
264	Photo	0.0
270	Photo	1.0
272	Photo	1.0
288	Photo	0.0
323	Photo	0.0
328	Photo	0.0
346	Photo	0.0
349	Photo	0.0
370	Photo	0.0
371	Status	1.0
379	Photo	1.0
391	Photo	1.0
442	Photo	0.0

	Type	Paid
460	Photo	0.0
476	Photo	1.0
480	Photo	0.0

In [25]:
```
subset_3.shape
```

Out[25]: (36, 2)

In [31]:
```
# Creating a subset by index range
subset_4=df.iloc[10:20]
```

In [32]:
```
subset_4
```

Out[32]:

	Unnamed: 0	Page total likes	Type	Category	Post Month	Post Weekday	Post Hour	Paid	Lifetin Po Tot Rea
10	10	139441	Status	2	12	5	10	0.0	217
11	11	139441	Photo	2	12	5	10	0.0	31
12	12	139441	Photo	2	12	5	10	0.0	28
13	13	139441	Photo	2	12	5	3	0.0	25
14	14	138414	Photo	2	12	4	5	1.0	227
15	15	138414	Status	2	12	3	10	0.0	100
16	16	138414	Photo	3	12	3	3	0.0	17
17	17	138414	Photo	1	12	2	12	1.0	532
18	18	138414	Status	3	12	2	3	0.0	39
19	19	138414	Photo	3	12	1	11	0.0	15

In [33]:
```
subset_4.shape
```

Out[33]: (10, 20)

In [34]:
```
# Creating a subset by randomly sampling 10% of the data
subset_5=df.sample(frac=0.1,random_state=1)
```

In [35]:
```
subset_5
```

Out[35]:

	Unnamed: 0	Page total likes	Type	Category	Post Month	Post Weekday	Post Hour	Paid	Lifeti P To Re
304	304	124940	Photo	1	6	4	12	0.0	58
340	340	117764	Photo	3	5	4	4	0.0	5
47	47	138353	Link	1	12	3	2	0.0	1
67	67	138185	Photo	1	11	7	3	1.0	53
479	479	86909	Photo	3	1	5	4	0.0	6
485	485	86491	Link	1	1	2	2	0.0	5
310	310	124940	Photo	1	6	1	13	0.0	4
31	31	138895	Photo	2	12	3	10	0.0	1
249	249	129600	Photo	2	7	7	11	1.0	2
90	90	137059	Photo	1	11	2	3	0.0	24
322	322	123047	Photo	3	6	2	5	1.0	3
168	168	135428	Photo	1	9	3	10	0.0	41
119	119	136393	Photo	1	10	7	10	0.0	
66	66	138185	Photo	1	11	7	11	0.0	2
305	305	124940	Photo	3	6	4	2	0.0	4
189	189	133679	Photo	2	9	2	10	0.0	3
434	434	100732	Photo	1	3	6	15	0.0	5
289	289	125612	Photo	1	6	4	11	0.0	2
142	142	136013	Status	2	10	3	2	1.0	31
146	146	136013	Photo	3	10	1	3	0.0	18
293	293	125612	Photo	2	6	3	3	0.0	3
312	312	124940	Photo	3	6	7	10	0.0	3
311	311	124940	Photo	3	6	1	3	0.0	3
492	492	85979	Link	1	1	5	11	0.0	45
65	65	138185	Photo	1	11	1	3	0.0	3
374	374	113028	Photo	1	4	4	12	1.0	6
34	34	138895	Photo	1	12	2	3	0.0	3

	Unnamed: 0	Page total likes	Type	Category	Post Month	Post Weekday	Post Hour	Paid	Lifeti P To Re
342	342	117764	Photo	2	5	2	11	0.0	6
173	173	135195	Photo	1	9	1	4	0.0	4
201	201	132817	Photo	1	8	3	9	0.0	3
179	179	135195	Photo	2	9	4	10	0.0	3
306	306	124940	Photo	2	6	3	13	0.0	6
233	233	131630	Photo	1	7	1	11	0.0	4
442	442	98195	Photo	3	3	4	13	0.0	34
345	345	117764	Photo	3	5	7	13	1.0	4
128	128	136393	Photo	1	10	6	13	0.0	
277	277	126424	Video	1	6	2	13	0.0	139
4	4	139441	Photo	2	12	2	3	0.0	7
401	401	107907	Photo	1	4	3	13	1.0	46
361	361	116091	Photo	3	5	6	3	0.0	3
326	326	121540	Photo	2	5	7	14	0.0	3
430	430	100732	Link	1	3	7	14	0.0	2
467	467	91758	Photo	2	2	5	3	1.0	15
213	213	132201	Photo	3	8	4	11	1.0	1
330	330	120050	Photo	3	5	3	12	0.0	21
329	329	120050	Photo	3	5	4	4	1.0	4
295	295	125612	Photo	1	6	2	2	0.0	11
416	416	104070	Status	1	3	3	15	0.0	9
406	406	107907	Photo	3	4	7	3	0.0	4
102	102	137020	Photo	3	10	3	10	0.0	1

In [36]:
```
subset_5.shape
```

Out[36]: (50, 20)

In [38]:
```
# Creating a subset based on multiple conditions
subset_6=df[(df['Total Interactions']>500)&(df['Paid']<1)]
```

In [40]:
```
subset_6
```

Out[40]:

	Unnamed: 0	Page total likes	Type	Category	Post Month	Post Weekday	Post Hour	Paid	Lifeti P To Re
28	28	138895	Photo	2	12	5	3	0.0	9
101	101	137020	Photo	2	10	4	3	0.0	68
105	105	137020	Photo	1	10	2	4	0.0	70
168	168	135428	Photo	1	9	3	10	0.0	41
191	191	133679	Photo	3	8	1	10	0.0	19
199	199	132817	Photo	3	8	4	10	0.0	33
206	206	132201	Photo	1	8	1	3	0.0	50
240	240	130791	Photo	3	7	5	3	0.0	19
242	242	130791	Status	2	7	4	6	0.0	17
254	254	129600	Photo	3	7	5	3	0.0	54
264	264	128032	Photo	3	7	7	3	0.0	38
288	288	126141	Photo	1	6	4	12	0.0	20
323	323	123047	Photo	3	6	1	10	0.0	56
328	328	120050	Photo	3	5	4	12	0.0	39
346	346	117764	Photo	3	5	7	2	0.0	38
349	349	117764	Photo	3	5	5	13	0.0	81
370	370	113028	Photo	1	4	6	14	0.0	28
442	442	98195	Photo	3	3	4	13	0.0	34
460	460	92507	Photo	3	2	1	13	0.0	55
480	480	86909	Photo	2	1	4	11	0.0	11

In [41]:
```
subset_6.shape
```

Out[41]: (20, 20)

In [115…
```
# Creating a subset by selecting rows
submerge_1=df[['Total Interactions','share']].loc[0:4]
```

In [116…
```
submerge_1
```

Out[116…

	Total Interactions	share
0	100	17.0
1	164	29.0
2	80	14.0
3	1777	147.0
4	393	49.0

In [118…
```
submerge_2=df[['share','like']].loc[3:7]
```

In [119…
```
submerge_2
```

Out[119…

	share	like
3	147.0	1572.0
4	49.0	325.0
5	33.0	152.0
6	27.0	249.0
7	14.0	325.0

In [121…
```
# Merging data using inner join
merge_inner=pd.merge(submerge_1,submerge_2,on='share',how='inner')
```

In [122…
```
merge_inner
```

Out[122…

	Total Interactions	share	like
0	80	14.0	325.0
1	1777	147.0	1572.0
2	393	49.0	325.0

In [123…
```
# Merging data using outer join
merge_outer=pd.merge(submerge_1,submerge_2,on='share',how='outer')
```

In [124…
```
merge_outer
```

Out[124…

	Total Interactions	share	like
0	100.0	17.0	NaN
1	164.0	29.0	NaN
2	80.0	14.0	325.0
3	1777.0	147.0	1572.0
4	393.0	49.0	325.0
5	NaN	33.0	152.0
6	NaN	27.0	249.0

In [125…
```
# Merging data using left join
merge_left=pd.merge(submerge_1,submerge_2,on='share',how='left')
```

In [126…
```
merge_left
```

Out[126…

	Total Interactions	share	like
0	100	17.0	NaN
1	164	29.0	NaN
2	80	14.0	325.0
3	1777	147.0	1572.0
4	393	49.0	325.0

In [127…
```
# Merging data using right join
merge_right=pd.merge(submerge_1,submerge_2,on='share',how='right')
```

In [128…
```
merge_right
```

Out[128…

	Total Interactions	share	like
0	1777.0	147.0	1572.0
1	393.0	49.0	325.0
2	NaN	33.0	152.0
3	NaN	27.0	249.0
4	80.0	14.0	325.0

In [65]:
```
# Sorting by one column in ascending order
sort_single_asc=df.sort_values(by='Total Interactions',ascending=True)
```

In [66]:
```
sort_single_asc
```

Out[66]:

	Unnamed: 0	Page total likes	Type	Category	Post Month	Post Weekday	Post Hour	Paid	Lifeti P To Rea
417	417	104070	Photo	1	3	3	10	0.0	18
21	21	138414	Photo	1	12	7	10	0.0	13
441	441	98195	Photo	1	3	5	4	1.0	18
111	111	136736	Photo	1	10	6	8	0.0	12
100	100	137020	Photo	1	10	4	9	1.0	13
...	...	...	...	...	...	...	...	...	
349	349	117764	Photo	3	5	5	13	0.0	818
460	460	92507	Photo	3	2	1	13	0.0	555
168	168	135428	Photo	1	9	3	10	0.0	419
379	379	111620	Photo	3	4	1	14	1.0	1056
244	244	130791	Photo	2	7	3	5	1.0	1804

500 rows × 20 columns

In [67]:
```
# Sorting by one column in descending order
sort_single_dsc=df.sort_values(by='Total Interactions',ascending=False)
```

In [68]:
```
sort_single_dsc
```

Out[68]:

	Unnamed: 0	Page total likes	Type	Category	Post Month	Post Weekday	Post Hour	Paid	Lifeti P To Rea
244	244	130791	Photo	2	7	3	5	1.0	1804
379	379	111620	Photo	3	4	1	14	1.0	1056
168	168	135428	Photo	1	9	3	10	0.0	419
460	460	92507	Photo	3	2	1	13	0.0	555
349	349	117764	Photo	3	5	5	13	0.0	818
...	...	...	...	...	...	...	...	...	
100	100	137020	Photo	1	10	4	9	1.0	13
417	417	104070	Photo	1	3	3	10	0.0	18
111	111	136736	Photo	1	10	6	8	0.0	12
441	441	98195	Photo	1	3	5	4	1.0	18
76	76	137893	Photo	1	11	3	2	0.0	12

500 rows × 20 columns

In [70]:
```
# Sorting by multiple columns, specifying ascending or descending for each
sort_multiple=df.sort_values(by=['share','Total Interactions'],ascending=[Tr
```

In [71]:
```
sort_multiple
```

Out[71]:

	Unnamed: 0	Page total likes	Type	Category	Post Month	Post Weekday	Post Hour	Paid	Lifeti P To Rea
436	436	100732	Photo	1	3	6	13	1.0	96
117	117	136642	Photo	1	10	7	11	0.0	7
430	430	100732	Link	1	3	7	14	0.0	29
431	431	100732	Photo	1	3	7	12	0.0	40
129	129	136393	Photo	1	10	6	12	0.0	7
...	...	...	...	...	...	...	...	...	
244	244	130791	Photo	2	7	3	5	1.0	1804
164	164	135428	Photo	1	9	5	10	0.0	10
124	124	136393	Photo	1	10	7	6	0.0	6
120	120	136393	Photo	1	10	7	9	0.0	5
111	111	136736	Photo	1	10	6	8	0.0	12

500 rows × 20 columns

In [76]:
```
# Sorting data by row index
sort_index=df.sort_index(axis=0,ascending=False)
```

In [77]:
```
sort_index
```

Out[77]:

	Unnamed: 0	Page total likes	Type	Category	Post Month	Post Weekday	Post Hour	Paid	Lifeti P To Re
499	499	81370	Photo	2	1	4	4	NaN	4
498	498	81370	Photo	3	1	4	11	0.0	4
497	497	81370	Photo	1	1	5	2	0.0	3
496	496	81370	Photo	2	1	5	8	0.0	3
495	495	85093	Photo	3	1	7	2	0.0	4
...	...	...	...	...	...	...	...	...	
4	4	139441	Photo	2	12	2	3	0.0	7
3	3	139441	Photo	2	12	2	10	1.0	50
2	2	139441	Photo	3	12	3	3	0.0	2
1	1	139441	Status	2	12	3	10	0.0	10
0	0	139441	Photo	2	12	4	3	0.0	2

500 rows × 20 columns

In [78]:
```
# Original data
df
```

Out[78]:

	Unnamed: 0	Page total likes	Type	Category	Post Month	Post Weekday	Post Hour	Paid	Lifeti P To Re
0	0	139441	Photo	2	12	4	3	0.0	2
1	1	139441	Status	2	12	3	10	0.0	10
2	2	139441	Photo	3	12	3	3	0.0	2
3	3	139441	Photo	2	12	2	10	1.0	50
4	4	139441	Photo	2	12	2	3	0.0	7
...	...	...	...	...	...	...	...	...	
495	495	85093	Photo	3	1	7	2	0.0	4
496	496	81370	Photo	2	1	5	8	0.0	3
497	497	81370	Photo	1	1	5	2	0.0	3
498	498	81370	Photo	3	1	4	11	0.0	4
499	499	81370	Photo	2	1	4	4	NaN	4

500 rows × 20 columns

In [80]:
```
# Transposing data
df_transposed=df.transpose()
```

In [81]:
```
df_transposed
```

Out[81]:

	0	1	2	3	4	5	6	
Unnamed: 0	0	1	2	3	4	5	6	
Page total likes	139441	139441	139441	139441	139441	139441	139441	13944
Type	Photo	Status	Photo	Photo	Photo	Status	Photo	Pho
Category	2	2	3	2	2	2	3	
Post Month	12	12	12	12	12	12	12	1
Post Weekday	4	3	3	2	2	1	1	
Post Hour	3	10	3	10	3	9	3	
Paid	0.0	0.0	0.0	1.0	0.0	0.0	1.0	1
Lifetime Post Total Reach	2752	10460	2413	50128	7244	10472	11692	1372
Lifetime Post Total Impressions	5091	19057	4373	87991	13594	20849	19479	2413
Lifetime Engaged Users	178	1457	177	2211	671	1191	481	51
Lifetime Post Consumers	109	1361	113	790	410	1073	265	21
Lifetime Post Consumptions	159	1674	154	1119	580	1389	364	30
Lifetime Post Impressions by people who have liked your Page	3078	11710	2812	61027	6228	16034	15432	1972
Lifetime Post reach by people who like your Page	1640	6112	1503	32048	3200	7852	9328	1105
Lifetime People who have liked your Page and engaged with your post	119	1108	132	1386	396	1016	379	42
comment	4	5	0	58	19	1	3	
like	79.0	130.0	66.0	1572.0	325.0	152.0	249.0	325
share	17.0	29.0	14.0	147.0	49.0	33.0	27.0	14
Total Interactions	100	164	80	1777	393	186	279	31

20 rows × 500 columns

In [82]:
```
df.shape
```

Out[82]: (500, 20)

In [83]:
```
# Reshaping data by using melt
df_melt=df.melt(id_vars=['Paid'],value_vars=['Type','Category'])
```

In [84]:
```
df_melt
```

Out[84]:

	Paid	variable	value
0	0.0	Type	Photo
1	0.0	Type	Status
2	0.0	Type	Photo
3	1.0	Type	Photo
4	0.0	Type	Photo
...	...	...	...
995	0.0	Category	3
996	0.0	Category	2
997	0.0	Category	1
998	0.0	Category	3
999	NaN	Category	2

1000 rows × 3 columns

In [107…
```
# Reshaping data by using pivot
df_pivot=df_melt.pivot_table(index='Paid',columns='variable',values='value',
```

In [108…
```
df_pivot
```

Out[108…

variable	Category	Type
Paid		
0.0	2	Photo
1.0	2	Photo

In [109…
```
# Reshaping data using stack
df_stacked = df.stack()
```

In [110…
```
df_stacked
```

Out[110…
```
0    Unnamed: 0
0
     Page total likes
139441
     Type
Photo
     Category
2
     Post Month
12


...
499  Lifetime People who have liked your Page and engaged with your post
316
     comment
0
     like
91.0
     share
28.0
     Total Interactions
119
Length: 9994, dtype: object
```

In [111…
```
# Reshaping data using unstack
df_unstacked=df.unstack()
```

In [112…
```
df_unstacked
```

Out[112…
```
Unnamed: 0          0        0
                    1        1
                    2        2
                    3        3
                    4        4
                           ...
Total Interactions  495     84
                    496     75
                    497    115
                    498    136
                    499    119
Length: 10000, dtype: object
```