In [1]:
```python
#Import Libraries

import numpy as np
import pandas as pd
```

In [2]:
```python
fb = pd.read_csv("dataset_Facebook.csv", delimiter=";")
```

Data Pre processing

In [3]:
```python
fb.head(5)
```

Out[3]:

	Page total likes	Type	Category	Post Month	Post Weekday	Post Hour	Paid	Lifetime Post Total Reach	Lifetime Post Total Impressions	Lifetime Engaged Users	Lifetime Consu
0	139441	Photo	2	12	4	3	0.0	2752	5091	178	
1	139441	Status	2	12	3	10	0.0	10460	19057	1457	
2	139441	Photo	3	12	3	3	0.0	2413	4373	177	
3	139441	Photo	2	12	2	10	1.0	50128	87991	2211	
4	139441	Photo	2	12	2	3	0.0	7244	13594	671	

In [4]:
```python
print(fb.columns)
```

```
Index(['Page total likes', 'Type', 'Category', 'Post Month', 'Post Week
day',
       'Post Hour', 'Paid', 'Lifetime Post Total Reach',
       'Lifetime Post Total Impressions', 'Lifetime Engaged Users',
       'Lifetime Post Consumers', 'Lifetime Post Consumptions',
       'Lifetime Post Impressions by people who have liked your Page',
       'Lifetime Post reach by people who like your Page',
       'Lifetime People who have liked your Page and engaged with your
post',
       'comment', 'like', 'share', 'Total Interactions'],
      dtype='object')
```

In [5]: `fb.info()`

```
 0   Page total likes
500 non-null    int64
 1   Type
500 non-null    object
 2   Category
500 non-null    int64
 3   Post Month
500 non-null    int64
 4   Post Weekday
500 non-null    int64
 5   Post Hour
500 non-null    int64
 6   Paid
499 non-null    float64
 7   Lifetime Post Total Reach
500 non-null    int64
 8   Lifetime Post Total Impressions
500 non-null    int64
 9   Lifetime Engaged Users
500 non-null    int64
```

In [6]: `fb.describe()`

Out[6]:

	Page total likes	Category	Post Month	Post Weekday	Post Hour	Paid	Lifetime Post Total Reach
count	500.000000	500.000000	500.000000	500.000000	500.000000	499.000000	500.00000
mean	123194.176000	1.880000	7.038000	4.150000	7.840000	0.278557	13903.36000
std	16272.813214	0.852675	3.307936	2.030701	4.368589	0.448739	22740.78789
min	81370.000000	1.000000	1.000000	1.000000	1.000000	0.000000	238.00000
25%	112676.000000	1.000000	4.000000	2.000000	3.000000	0.000000	3315.00000
50%	129600.000000	2.000000	7.000000	4.000000	9.000000	0.000000	5281.00000
75%	136393.000000	3.000000	10.000000	6.000000	11.000000	1.000000	13168.00000

Create Data Subset

In [7]:
```python
fb_subset = fb[['Type', 'Category', 'Lifetime Post Total Reach']].head(1
print(fb_subset)
```

```
     Type  Category  Lifetime Post Total Reach
0   Photo         2                       2752
1  Status         2                      10460
2   Photo         3                       2413
3   Photo         2                      50128
4   Photo         2                       7244
5  Status         2                      10472
6   Photo         3                      11692
7   Photo         3                      13720
8  Status         2                      11844
9   Photo         3                       4694
```

In [8]: `amazon_data = pd.read_csv("customer reviews.csv")`

In [9]: `amazon_data.head(5)`

Out[9]:

	Sno	book name	review title	reviewer	reviewer rating	review description	is_verified	date	timestamp	
0	0	The Woman in Me	Unbelievably impressive. Her torn life on paper.	Murderess Marbie	4	I'm only a third way in. Shipped lightening fa...	True	26-10-2023	Reviewed in the United States October 26, 2023	1668
1	1	The Woman in Me	What a heartbreaking story	L J	5	"There have been so many times when I was scar...	True	06-11-2023	Reviewed in the United States November 6, 2023	1668
2	2	The Woman in Me	Britney you are so invincible! You are an insp...	Jamie	5	The media could not be loaded. I personally ha...	True	01-11-2023	Reviewed in the United States November 1, 2023	1668
3	3	The Woman in Me	Fast Read, Sad Story	KMG	5	I have been a fan of Britney's music since the...	True	25-10-2023	Reviewed in the United States October 25, 2023	1668
4	4	The Woman in Me	Buy it, it's worth the read!	Stephanie Brown	5	Whether or not you're a fan, it's a great read...	True	01-11-2023	Reviewed in the United States November 1, 2023	1668

In [10]: `print(amazon_data.columns)`

```
Index(['Sno', 'book name', 'review title', 'reviewer', 'reviewer ratin
g',
       'review description', 'is_verified', 'date', 'timestamp', 'ASI
N'],
      dtype='object')
```

In [11]: `amazon_data.columns = amazon_data.columns.str.replace(" ", "_")`

In [12]: `print(amazon_data.columns)`

```
Index(['Sno', 'book_name', 'review_title', 'reviewer', 'reviewer_ratin
g',
       'review_description', 'is_verified', 'date', 'timestamp', 'ASI
N'],
      dtype='object')
```

In [13]:
```python
amazon_subset = amazon_data[['book_name', 'reviewer', 'reviewer_rating',
print("\n📌 Amazon Subset:\n", amazon_subset)
```

```
📌 Amazon Subset:
             book_name           reviewer  reviewer_rating  \
0  The Woman in Me  Murderess Marbie                4
1  The Woman in Me               L J                5
2  The Woman in Me             Jamie                5
3  The Woman in Me               KMG                5
4  The Woman in Me   Stephanie Brown                5
5  The Woman in Me        Leanne S.                5
6  The Woman in Me             Kayce                5
7  The Woman in Me      Thomas Ward                5
8  The Woman in Me       katereviews                5
9  The Woman in Me                 C                5

                                   review_description
0  I'm only a third way in. Shipped lightening fa...
1  "There have been so many times when I was scar...
2  The media could not be loaded. I personally ha...
3  I have been a fan of Britney's music since the...
```

Merge Data

In [14]:
```python
fb["key"] = 1
amazon_data["key"] = 1
```

```
In [15]:  merged_data = pd.merge(fb, amazon_data, on="key").drop(columns=["key"])
          print("\n📌 Merged Data:\n", merged_data.head())
```

📌 Merged Data:
```
     Page total likes   Type  Category  Post Month  Post Weekday  Post H
our  \
0             139441  Photo         2          12             4
3
1             139441  Photo         2          12             4
3
2             139441  Photo         2          12             4
3
3             139441  Photo         2          12             4
3
4             139441  Photo         2          12             4
3

    Paid  Lifetime Post Total Reach  Lifetime Post Total Impressions  \
0   0.0                       2752                             5091
1   0.0                       2752                             5091
2   0.0                       2752                             5091
3   0.0                       2752                             5091
4   0.0                       2752                             5091

    Lifetime Engaged Users  ...  Sno        book_name  \
0                      178  ...    0  The Woman in Me
1                      178  ...    1  The Woman in Me
2                      178  ...    2  The Woman in Me
3                      178  ...    3  The Woman in Me
4                      178  ...    4  The Woman in Me

                                     review_title          reviewer
\
0   Unbelievably impressive. Her torn life on paper.  Murderess Marbie
1                         What a heartbreaking story               L J
2  Britney you are so invincible! You are an insp...             Jamie
3                           Fast Read, Sad Story               KMG
4                 Buy it, it's worth the read!  Stephanie Brown

   reviewer_rating                             review_description
\
0                4  I'm only a third way in. Shipped lightening fa...
1                5  "There have been so many times when I was scar...
2                5  The media could not be loaded. I personally ha...
3                5  I have been a fan of Britney's music since the...
4                5  Whether or not you're a fan, it's a great read...

   is_verified        date                                      timest
amp  \
0         True  26-10-2023  Reviewed in the United States October 26, 2
023
1         True  06-11-2023  Reviewed in the United States November 6, 2
023
2         True  01-11-2023  Reviewed in the United States November 1, 2
023
3         True  25-10-2023  Reviewed in the United States October 25, 2
023
4         True  01-11-2023  Reviewed in the United States November 1, 2
023

         ASIN
0  1668009048
1  1668009048
2  1668009048
3  1668009048
```

```
4   1668009048
```

[5 rows x 29 columns]

Sort Data

```
In [16]: sorted_fb = fb.sort_values(by='Lifetime Post Total Reach', ascending=Fal
         print("\n📌 Sorted Facebook Data:\n", sorted_fb.head())
```

📌 Sorted Facebook Data:

	Page total likes	Type	Category	Post Month	Post Weekday	Post Hour
244	130791	Photo	2	7	3	5
464	92079	Photo	1	2	6	13
463	92186	Photo	3	2	7	2
277	126424	Video	1	6	2	13
380	111620	Photo	1	4	7	14

	Paid	Lifetime Post Total Reach	Lifetime Post Total Impressions
244	1.0	180480	319133
464	0.0	158208	453213
463	1.0	153536	497910
277	0.0	139008	277100
380	0.0	128064	251269

	Lifetime Engaged Users	Lifetime Post Consumers
244	8072	4010
464	2482	2319
463	1713	1633
277	1779	1643
380	1539	1408

	Lifetime Post Consumptions
244	6242
464	3412
463	2493
277	2356
380	2506

	Lifetime Post Impressions by people who have liked your Page
244	108752
464	81938
463	8907
277	107502
380	84046

	Lifetime Post reach by people who like your Page
244	51456
464	20608
463	5696
277	38720
380	32384

	Lifetime People who have liked your Page and engaged with your post
244	3316
464	1034
463	593
277	1008
380	985

	comment	like	share	Total Interactions	key
244	372	5172.0	790.0	6334	1
464	9	268.0	36.0	313	1
463	8	134.0	34.9	176	1

```
277        23   204.0   44.0                  271    1
380         8   186.0   18.0                  212    1
```

In [17]:
```python
sorted_amazon = amazon_data.sort_values(by='reviewer_rating', ascending=
print("\n📌 Sorted Amazon Data:\n", sorted_amazon.head())
```

```
📌 Sorted Amazon Data:
       Sno                            book_name  \
460    460              Flash Cards: Sight Words
537    537                             Elon Musk
576    576  The Covenant of Water (Oprah's Book Club)
577    577  The Covenant of Water (Oprah's Book Club)
578    578  The Covenant of Water (Oprah's Book Club)

                          review_title           reviewer  \
460                   Good learning tool  Shirley Schmaltz
537  Most interesting book I have ever read.          wylabird
576                     Incredible story   Kindle Customer
577             775 pages wasn't enough!          Princess
578                 Brilliant storytelling            Romfan

     reviewer_rating                          review_description
\
460                5  My grandson never used them. He was home schoo...
537                5  The book is a very long and detailed book but ...
576                5  This is a very long book, and it took me a lon...
577                5  This was a great generational saga that I wish...
578                5  Loved the book. Despite the numerous tragedies...

     is_verified        date                                       time
stamp  \
460         True  04-11-2023  Reviewed in the United States November 4,
2023
537         True  04-11-2023  Reviewed in the United States November 4,
2023
576         True  31-10-2023  Reviewed in the United States October 31,
2023
577         True  20-10-2023  Reviewed in the United States October 20,
2023
578         True  04-11-2023  Reviewed in the United States November 4,
2023

           ASIN  key
460  1338233580    1
537  1982181281    1
576   802162177    1
577   802162177    1
578   802162177    1
```

Transposing Data

In [18]:
```python
transposed_fb = fb.head().transpose()
print("\n📌 Transposed Facebook Data:\n", transposed_fb)
```

📌 Transposed Facebook Data:

```
                                                      0       1
2  \
Page total likes                                 139441  139441  139
441
Type                                              Photo  Status   Ph
oto
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    2
413
Lifetime Post Total Impressions                    5091   19057    4
373
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    2
812
Lifetime Post reach by people who like your Page   1640    6112    1
503
Lifetime People who have liked your Page and en...   119    1108
132
comment                                               4       5
0
like                                               79.0   130.0    6
6.0
share                                              17.0    29.0    1
4.0
Total Interactions                                  100     164
80
key                                                   1       1
1


                                                      3       4
Page total likes                                 139441  139441
Type                                              Photo   Photo
Category                                              2       2
Post Month                                           12      12
Post Weekday                                          2       2
Post Hour                                             10       3
Paid                                                1.0     0.0
Lifetime Post Total Reach                         50128    7244
Lifetime Post Total Impressions                   87991   13594
Lifetime Engaged Users                             2211     671
Lifetime Post Consumers                             790     410
Lifetime Post Consumptions                         1119     580
Lifetime Post Impressions by people who have li...  61027    6228
Lifetime Post reach by people who like your Page   32048    3200
Lifetime People who have liked your Page and en...   1386     396
comment                                              58      19
like                                              1572.0   325.0
```

```
share                                        147.0    49.0
Total Interactions                          1777     393
key                                            1        1
```

Melting Data to long format

In [19]:
```python
melted_fb = pd.melt(fb, id_vars=['Type'], value_vars=['Lifetime Post Tot
print("\n📌 Melted Facebook Data:\n", melted_fb.head())
```

```
📌 Melted Facebook Data:
        Type              variable  value
0   Photo  Lifetime Post Total Reach   2752
1  Status  Lifetime Post Total Reach  10460
2   Photo  Lifetime Post Total Reach   2413
3   Photo  Lifetime Post Total Reach  50128
4   Photo  Lifetime Post Total Reach   7244
```

In [20]:
```python
print("✅ Data Processing Completed Successfully!")
```

```
✅ Data Processing Completed Successfully!
```

In [ ]: