

```
In [1]: import pandas as pd
```

```
In [2]: !pip3 install seaborn
```

```
Requirement already satisfied: seaborn in ./anaconda3/lib/python3.10/site-packages (0.12.2)  
Requirement already satisfied: pandas>=0.25 in ./anaconda3/lib/python3.10/site-packages (from seaborn) (1.5.3)  
Requirement already satisfied: matplotlib!=3.6.1,>=3.1 in ./anaconda3/lib/python3.10/site-packages (from seaborn) (3.7.0)  
Requirement already satisfied: numpy!=1.24.0,>=1.17 in ./anaconda3/lib/python3.10/site-packages (from seaborn) (1.23.5)  
Requirement already satisfied: kiwisolver>=1.0.1 in ./anaconda3/lib/python3.10/site-packages (from matplotlib!=3.6.1,>=3.1->seaborn) (1.4.4)  
Requirement already satisfied: cycler>=0.10 in ./anaconda3/lib/python3.10/site-packages (from matplotlib!=3.6.1,>=3.1->seaborn) (0.11.0)  
Requirement already satisfied: python-dateutil>=2.7 in ./anaconda3/lib/python3.10/site-packages (from matplotlib!=3.6.1,>=3.1->seaborn) (2.8.2)  
Requirement already satisfied: packaging>=20.0 in ./anaconda3/lib/python3.10/site-packages (from matplotlib!=3.6.1,>=3.1->seaborn) (22.0)  
Requirement already satisfied: pyparsing>=2.3.1 in ./anaconda3/lib/python3.10/site-packages (from matplotlib!=3.6.1,>=3.1->seaborn) (3.0.9)  
Requirement already satisfied: fonttools>=4.22.0 in ./anaconda3/lib/python3.10/site-packages (from matplotlib!=3.6.1,>=3.1->seaborn) (4.25.0)  
Requirement already satisfied: pillow>=6.2.0 in ./anaconda3/lib/python3.10/site-packages (from matplotlib!=3.6.1,>=3.1->seaborn) (9.4.0)  
Requirement already satisfied: contourpy>=1.0.1 in ./anaconda3/lib/python3.10/site-packages (from matplotlib!=3.6.1,>=3.1->seaborn) (1.0.5)  
Requirement already satisfied: pytz>=2020.1 in ./anaconda3/lib/python3.10/site-packages (from pandas>=0.25->seaborn) (2022.7)  
Requirement already satisfied: six>=1.5 in ./anaconda3/lib/python3.10/site-packages (from python-dateutil>=2.7->matplotlib!=3.6.1,>=3.1->seaborn) (1.16.0)
```

```
In [ ]:
```

```
In [3]: data1=pd.read_csv("/home/placement/Desktop/prasanna/basket_details.csv")
```

```
In [4]: data1.describe()
```

```
Out[4]:
```

	customer_id	product_id	basket_count
count	1.500000e+04	1.500000e+04	15000.000000
mean	1.808567e+07	3.269771e+07	2.153733
std	1.233000e+07	1.629455e+07	0.517929
min	4.784000e+03	4.939000e+04	2.000000
25%	8.659327e+06	3.137412e+07	2.000000
50%	1.520775e+07	3.694759e+07	2.000000
75%	2.663904e+07	4.502408e+07	2.000000
max	4.460824e+07	5.579097e+07	10.000000

```
In [6]: data1.tail()
```

```
Out[6]:
```

	customer_id	product_id	basket_date	basket_count
14995	8336862	50977318	2019-05-26	2
14996	9500785	43862061	2019-05-26	2
14997	22787344	6041664	2019-05-26	2
14998	8221263	3597369	2019-05-26	2
14999	4912577	46646893	2019-05-26	2

```
In [7]: data=pd.read_csv("/home/placement/Desktop/prasanna/customer_details.csv")
```

```
In [8]: data.describe()
```

```
Out[8]:
```

	customer_id	customer_age	tenure
count	2.000000e+04	20000.000000	20000.000000
mean	1.760040e+07	262.222550	44.396800
std	8.679505e+06	604.321589	31.998376
min	2.093000e+03	-34.000000	4.000000
25%	1.188115e+07	29.000000	21.000000
50%	1.560912e+07	38.000000	35.000000
75%	2.228484e+07	123.000000	60.000000
max	4.462566e+07	2022.000000	133.000000

```
In [9]: data1.tail()
```

```
Out[9]:
```

	customer_id	product_id	basket_date	basket_count
14995	8336862	50977318	2019-05-26	2
14996	9500785	43862061	2019-05-26	2
14997	22787344	6041664	2019-05-26	2
14998	8221263	3597369	2019-05-26	2
14999	4912577	46646893	2019-05-26	2

```
In [10]: data.groupby(['customer_id']).count()
```

```
Out[10]:
```

	sex	customer_age	tenure
customer_id			
2093	1	1	1
12817	1	1	1
14309	1	1	1
15155	1	1	1
23205	1	1	1
...
44392831	1	1	1
44401175	1	1	1
44431821	1	1	1
44621778	1	1	1
44625658	1	1	1

20000 rows × 3 columns

```
In [11]: data1.groupby(['customer_id']).count()
```

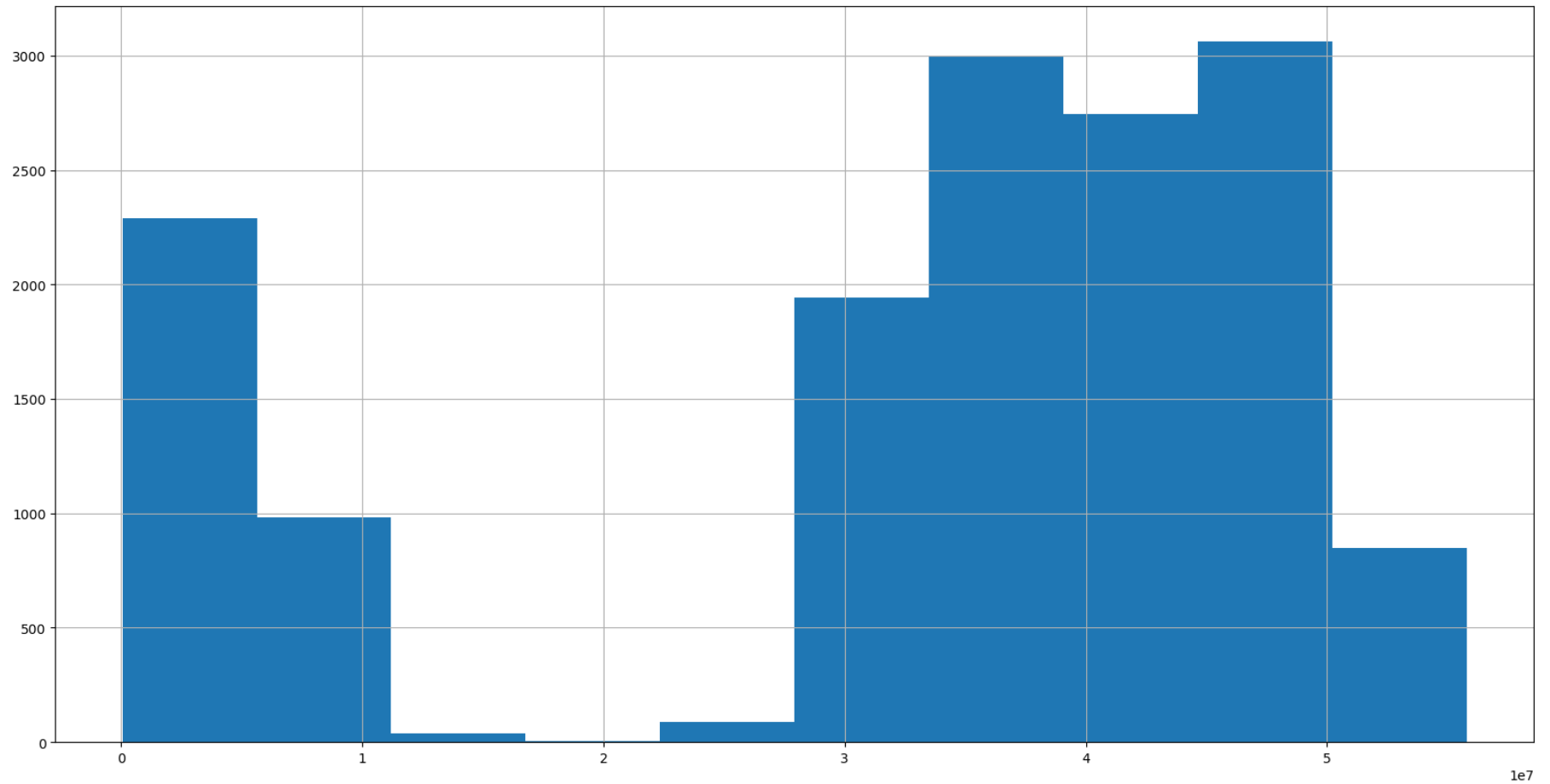
```
Out[11]:
```

	product_id	basket_date	basket_count
customer_id			
4784	1	1	1
8314	2	2	2
8857	1	1	1
9273	1	1	1
11172	1	1	1
...
44460516	1	1	1
44461180	1	1	1
44473609	1	1	1
44486815	1	1	1
44608245	1	1	1

13871 rows × 3 columns

```
In [12]: data1['product_id'].hist(figsize=(20,10))
```

```
Out[12]: <Axes: >
```



```
In [13]: test=pd.merge(data,data1,on= "customer_id")
```

```
In [14]: test
```

```
Out[14]:
```

	customer_id	sex	customer_age	tenure	product_id	basket_date	basket_count
0	9500953	Male	55.0	96	3446783	2019-06-10	3
1	851739	Male	40.0	129	32920704	2019-06-19	2
2	9654043	Male	37.0	95	51307669	2019-06-08	2
3	4912369	Male	36.0	114	33923115	2019-05-20	2
4	9875271	Male	34.0	92	31586037	2019-06-06	2
...
67	13278573	Male	28.0	47	4488682	2019-05-26	2
68	12901520	Female	40.0	50	38610580	2019-05-28	3
69	12737235	Male	39.0	51	32933848	2019-05-21	2
70	12737235	Male	39.0	51	46373374	2019-05-21	3
71	12574807	Male	33.0	52	32056122	2019-05-25	2

72 rows × 7 columns

```
In [15]: test.head()
```

```
Out[15]:
```

	customer_id	sex	customer_age	tenure	product_id	basket_date	basket_count
0	9500953	Male	55.0	96	3446783	2019-06-10	3
1	851739	Male	40.0	129	32920704	2019-06-19	2
2	9654043	Male	37.0	95	51307669	2019-06-08	2
3	4912369	Male	36.0	114	33923115	2019-05-20	2
4	9875271	Male	34.0	92	31586037	2019-06-06	2

```
In [16]: test.describe()
```

```
Out[16]:
```

	customer_id	customer_age	tenure	product_id	basket_count
count	7.200000e+01	72.000000	72.000000	7.200000e+01	72.000000
mean	1.554364e+07	68.458333	56.180556	3.140376e+07	2.152778
std	9.961282e+06	234.574289	38.948621	1.616160e+07	0.362298
min	3.809750e+05	5.000000	4.000000	8.287500e+04	2.000000
25%	1.026443e+07	29.000000	24.750000	2.980404e+07	2.000000
50%	1.352736e+07	35.500000	45.500000	3.498005e+07	2.000000
75%	2.037478e+07	43.000000	83.750000	4.359420e+07	2.000000
max	4.328080e+07	2022.000000	130.000000	5.130767e+07	3.000000


```
In [17]: test.min()
```

```
Out[17]: customer_id      380975  
sex          Female  
customer_age      5.0  
tenure          4  
product_id      82875  
basket_date     2019-05-20  
basket_count      2  
dtype: object
```

```
In [18]: test.max()
```

```
Out[18]: customer_id      43280797  
sex          Male  
customer_age     2022.0  
tenure         130  
product_id     51307669  
basket_date     2019-06-19  
basket_count      3  
dtype: object
```

```
In [19]: test.customer_id.unique()
```

```
Out[19]: array([ 9500953,   851739,   9654043,   4912369,   9875271,  11737579,  
                10619833,   4193819,   4897641,   4643359,    380975,  11623549,  
                11724853,  12410433,  10394153,    537173,  11440499,  10439331,  
                10629563,   4257099,  11346069,   8508353,   9700145,  10814041,  
                 9804585,   4238087,  11665521,   1030589,  11072047,  43280797,  
                41790413,  39814593,  36623391,  34677755,  29144255,  27081691,  
                25055107,  25567283,  23179191,  22524187,  21765975,  21142247,  
                20789769,  20236456,  20174063,  17909829,  18256077,  17830393,  
                16944627,  16398473,  16029475,  15436141,  15570891,  15192667,  
                15067633,  14966315,  15141119,  14248059,  14053193,  13776147,  
                13278573,  12901520,  12737235,  12574807])
```

```
In [20]: data1.head()
```

```
Out[20]:
```

	customer_id	product_id	basket_date	basket_count
0	42366585	41475073	2019-06-19	2
1	35956841	43279538	2019-06-19	2
2	26139578	31715598	2019-06-19	3
3	3262253	47880260	2019-06-19	2
4	20056678	44747002	2019-06-19	2

```
In [23]: data1.groupby(['product_id'])['basket_count'].sum().sort_values(ascending=True)#ao
```

```
Out[23]: product_id
49390      2
42094163   2
42102274   2
42110403   2
42110580   2
...
34913531  28
46130148  36
39833031  50
31516269  59
43524799  69
Name: basket_count, Length: 13161, dtype: int64
```

```
In [25]: data1.groupby(['product_id'])['basket_count'].sum().sort_values(ascending=False)#do
```

```
Out[25]: product_id
43524799    69
31516269    59
39833031    50
46130148    36
34913531    28
..
34003520     2
34003697     2
34004660     2
34013459     2
55790974     2
Name: basket_count, Length: 13161, dtype: int64
```

```
In [26]: test.groupby(['customer_age']).count()
```

```
Out[26]:
```

	customer_id	sex	tenure	product_id	basket_date	basket_count
customer_age						
5.0	1	1	1	1	1	1
22.0	2	2	2	2	2	2
23.0	1	1	1	1	1	1
24.0	2	2	2	2	2	2
25.0	2	2	2	2	2	2
26.0	1	1	1	1	1	1
27.0	4	4	4	4	4	4
28.0	3	3	3	3	3	3
29.0	6	6	6	6	6	6
30.0	3	3	3	3	3	3
32.0	4	4	4	4	4	4
33.0	2	2	2	2	2	2
34.0	3	3	3	3	3	3
35.0	2	2	2	2	2	2
36.0	4	4	4	4	4	4
37.0	2	2	2	2	2	2
39.0	3	3	3	3	3	3
40.0	5	5	5	5	5	5
41.0	1	1	1	1	1	1
42.0	2	2	2	2	2	2
43.0	3	3	3	3	3	3
45.0	1	1	1	1	1	1
46.0	1	1	1	1	1	1

	customer_id	sex	tenure	product_id	basket_date	basket_count
customer_age						
51.0	3	3	3	3	3	3
55.0	1	1	1	1	1	1
57.0	2	2	2	2	2	2
61.0	1	1	1	1	1	1
67.0	2	2	2	2	2	2
123.0	4	4	4	4	4	4
2022.0	1	1	1	1	1	1

In []: