

```
In [31]: import pandas as pd
```

```
In [47]: !pip3 install seaborn
```

```
Requirement already satisfied: seaborn in ./anaconda3/lib/python3.10/site-packages (0.12.2)  
Requirement already satisfied: matplotlib!=3.6.1,>=3.1 in ./anaconda3/lib/python3.10/site-packages (from se  
aborn) (3.7.0)  
Requirement already satisfied: numpy!=1.24.0,>=1.17 in ./anaconda3/lib/python3.10/site-packages (from seabo  
rn) (1.23.5)  
Requirement already satisfied: pandas>=0.25 in ./anaconda3/lib/python3.10/site-packages (from seaborn) (1.  
5.3)  
Requirement already satisfied: cycycler>=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 matpl  
otlib!=3.6.1,>=3.1->seaborn) (2.8.2)  
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: kiwisolver>=1.0.1 in ./anaconda3/lib/python3.10/site-packages (from matplotl  
ib!=3.6.1,>=3.1->seaborn) (1.4.4)  
Requirement already satisfied: contourpy>=1.0.1 in ./anaconda3/lib/python3.10/site-packages (from matplotli  
b!=3.6.1,>=3.1->seaborn) (1.0.5)  
Requirement already satisfied: packaging>=20.0 in ./anaconda3/lib/python3.10/site-packages (from matplotli  
b!=3.6.1,>=3.1->seaborn) (22.0)  
Requirement already satisfied: fonttools>=4.22.0 in ./anaconda3/lib/python3.10/site-packages (from matplotl  
ib!=3.6.1,>=3.1->seaborn) (4.25.0)  
Requirement already satisfied: pyparsing>=2.3.1 in ./anaconda3/lib/python3.10/site-packages (from matplotli  
b!=3.6.1,>=3.1->seaborn) (3.0.9)  
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 [48]: data=pd.read_csv("/home/placement/Desktop/hema/customer_details.csv")
```

```
In [49]: data.describe()
```

```
Out[49]:
```

	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 [50]: data1=pd.read_csv("/home/placement/Desktop/hema/basket_details.csv")
```

```
In [51]: data1.describe()
```

```
Out[51]:
```

	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 [52]: data.describe()
```

```
Out[52]:
```

	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 [53]: data1.describe()
```

```
Out[53]:
```

	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 [54]: data.tail()
```

```
Out[54]:
```

	customer_id	sex	customer_age	tenure
19995	12557307	Male	41.0	52
19996	12595961	Male	29.0	52
19997	12520991	Male	35.0	52
19998	12612719	Male	39.0	52
19999	12572063	Male	28.0	52

```
In [55]: data1.tail()
```

```
Out[55]:
```

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

```
Out[56]:
```

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

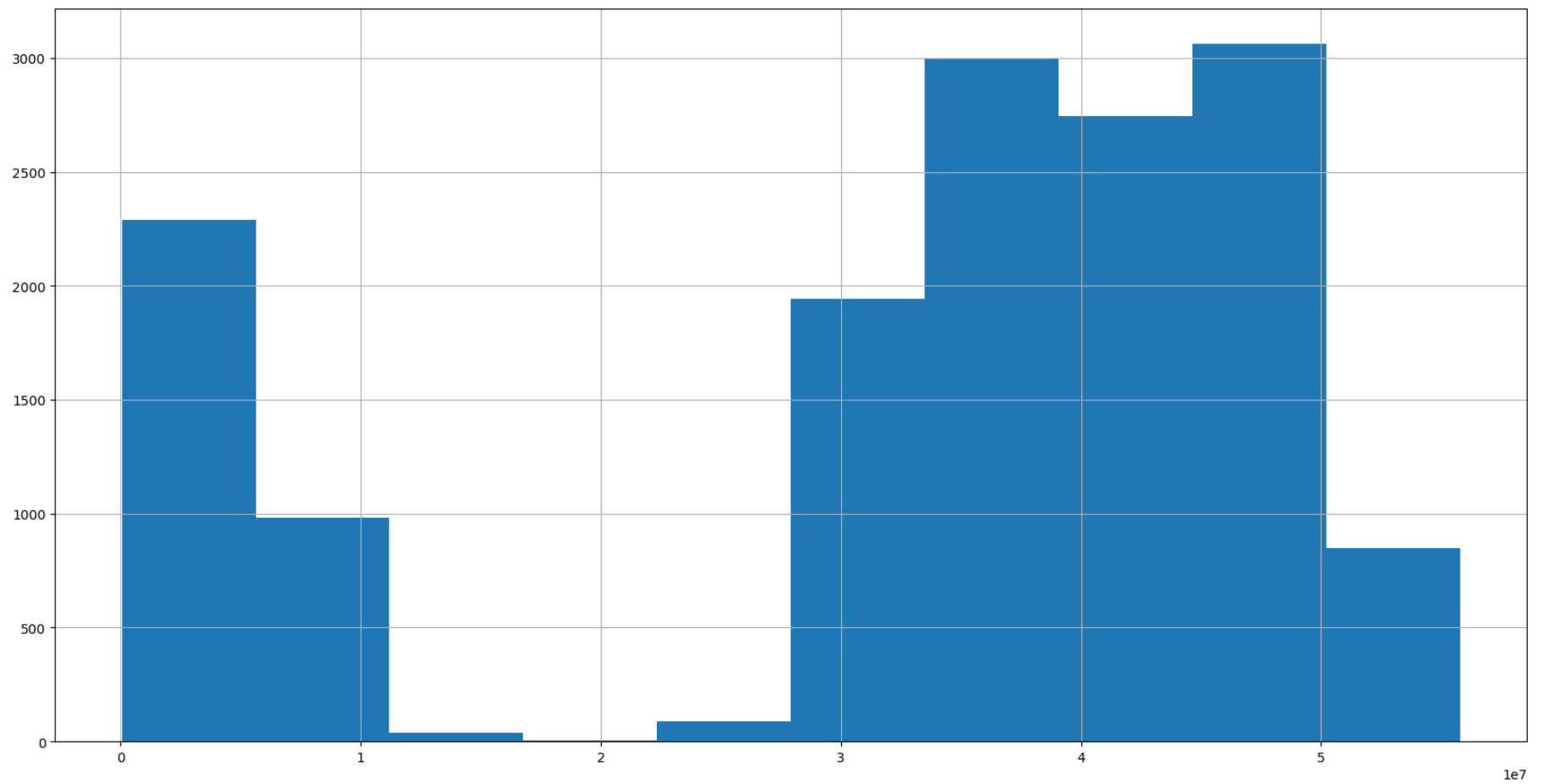
```
Out[57]:
```

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

```
Out[59]: <Axes: >
```



```
In [61]: test=pd.merge(data,data1,on='customer_id')
```

```
In [62]: test
```

```
Out[62]:
```

	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 [63]: test.head()
```

```
Out[63]:
```

	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 [65]: test.describe()
```

```
Out[65]:
```

	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 [66]: test.customer_id.unique()
```

```
Out[66]: 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 [70]: data1.groupby(['product_id'])['basket_count'].sum().sort_values(ascending=False)
#decending order
```

```
Out[70]: 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 [73]: data1.groupby(['product_id'])['basket_count'].sum().sort_values(ascending=True)
#acending order
```

```
Out[73]: 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 [74]: test.groupby(['customer_age']).count()
```

```
Out[74]:
```

	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 []: