Assignment-3

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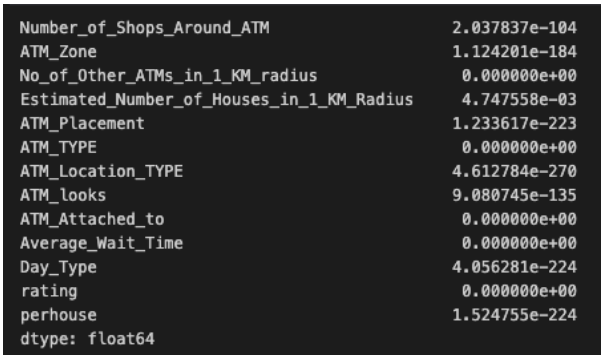
Advice on the company to decide about the location of the ATMs

The proposal needs to be formulated based on what the company pursues, because I believe that both rating and revenue are things that companies need to pay attention to. But as shown in the following figure, rating and revenue are not completely same (the closer the value is to 1, the higher the correlation), so I will make two assumptions.

	Number_of_Shops_Around_ATM	No_of_Other_ATMs_in_1_KM_radius	Estimated_Number_of_Houses_in_1_KM_Radius	Average_Wait_Time	rating	revenue	perhouse
Number_of_Shops_Around_ATM	1.000000	-0.350989	-0.139152	-0.023214	-0.012323	-0.083792	-0.051956
No_of_Other_ATMs_in_1_KM_radius	-0.350989	1.000000	0.291011	0.226601	0.167711	0.320885	-0.041529
Estimated_Number_of_Houses_in_1_KM_Radius	-0.139152	0.291011	1.000000	0.119615	0.067792	0.263767	0.880823
Average_Wait_Time	-0.023214	0.226601	0.119615	1.000000	-0.017973	0.168053	0.061226
rating	-0.012323	0.167711	0.067792	-0.017973	1.000000	0.659257	0.025816
revenue	-0.083792	0.320885	0.263767	0.168053	0.659257	1.000000	0.184274
perhouse	-0.051956	-0.041529	0.880823	0.061226	0.025816	0.184274	1.000000

- If the company focuses more on revenue

When considering the location of an ATM, the company should not consider about each variable one by one, because some variables have combination relative, like the number of other ATMs within a 1 km radius and the estimated number of houses within a 1 km radius. As shown in the following figure, the p-value of estimated number of houses in 1 km radius is relevantly high, which means the value of it has nothing to do with the revenue. But the p-value of perhouse (= no of other ATMs in 1 km radius / estimated number of house) is not that high. So, considering combination variable is much important that consider only one variable.



```
Number_of_Shops_Around_ATM                2.037837e-104
ATM_Zone                                  1.124201e-184
No_of_Other_ATMs_in_1_KM_radius            0.000000e+00
Estimated_Number_of_Houses_in_1_KM_Radius  4.747558e-03
ATM_Placement                             1.233617e-223
ATM_TYPE                                   0.000000e+00
ATM_Location_TYPE                         4.612784e-270
ATM_looks                                 9.080745e-135
ATM_Attached_to                            0.000000e+00
Average_Wait_Time                          0.000000e+00
Day_Type                                  4.056281e-224
rating                                     0.000000e+00
perhouse                                  1.524755e-224
dtype: float64
```

About the placement and type, I think the mean revenue can better illustrate the problem. Semi urban and facing road looks more likely to have more revenue.

```
ATM_TYPE
Bigger Towns    221233.549172
Semi Urban      245052.133649
Town            211320.809011
Urban           169958.984132
Name: revenue, dtype: float64
```

```
ATM_Placement
Facing Road      186342.561029
Little Inside    135441.147249
Name: revenue, dtype: float64
```

When consider the ATM_Location_TYPE, Passbook looks more likely to have more revenue.

```
ATM_Location_TYPE
Passbook     236696.312536
Printing     236696.312536
Checkdrop    208915.492578
Withdraw     192625.143463
WIthdraw     185395.395728
Deposit      148305.614542
Name: revenue, dtype: float64
```

- If the company focuses more on rating

Two of the most significant factors that customers are highly concerned about are the average wait time and day type. The value of ATM zone is the effect that costumers not care about. Because there is still a certain relationship between rating and revenue, banks also need to pay attention to wait time and day type in addition to the location selection.

```
ATM_Zone                                    5.442570e-03
No_of_Other_ATMs_in_1_KM_radius             8.198906e-69
Estimated_Number_of_Houses_in_1_KM_Radius   1.433570e-58
ATM_Placement                               4.315639e-35
ATM_TYPE                                    1.018589e-34
ATM_Location_TYPE                           2.295672e-27
ATM_looks                                   3.314444e-12
ATM_Attached_to                             1.316285e-33
Average_Wait_Time                           0.000000e+00
Day_Type                                    0.000000e+00
revenue                                     0.000000e+00
```