

Bank Personal Loan Modelling:

Taking out dependent variable:

```
In [39]: y = new.loc[:, 'Personal Loan']  
y
```

```
Out[39]: 0      0  
         1      0  
         2      0  
         3      0  
         4      0  
         ..  
        4995    0  
        4996    0  
        4997    0  
        4998    0  
        4999    0  
         Name: Personal Loan, Length: 5000, dtype: int64
```

Considering dependent variables:

```
In [40]: x = new[['ID', 'Age', 'Experience', 'Income', 'Family', 'CCAvg', 'Education', 'Mortgage',  
                'Securities Account', 'CD Account', 'Online', 'CreditCard']]  
x
```

```
Out[40]:
```

	ID	Age	Experience	Income	Family	CCAvg	Education	Mortgage	Securities Account	CD Account	Online	CreditCard
0	1	25	1	49	4	1.6	1	0	1	0	0	0
1	2	45	19	34	3	1.5	1	0	1	0	0	0
2	3	39	15	11	1	1.0	1	0	0	0	0	0
3	4	35	9	100	1	2.7	2	0	0	0	0	0
4	5	35	8	45	4	1.0	2	0	0	0	0	1
...
4995	4996	29	3	40	1	1.9	3	0	0	0	1	0
4996	4997	30	4	15	4	0.4	1	85	0	0	1	0
4997	4998	63	39	24	2	0.3	3	0	0	0	0	0
4998	4999	65	40	49	3	0.5	2	0	0	0	1	0
4999	5000	28	4	83	3	0.8	1	0	0	0	1	1

5000 rows x 12 columns

Ac
Go

Importing Logistic Regression:

```
In [41]: import statsmodels.api as sm

In [42]: x1 = sm.add_constant(x)

In [43]: Logistic = sm.Logit(y,x1)

In [44]: result = Logistic.fit()
          Optimization terminated successfully.
          Current function value: 0.128332
          Iterations 9

In [45]: result.summary()
```

Results:

Out[45]: Logit Regression Results

Dep. Variable:	Personal Loan	No. Observations:	5000
Model:	Logit	Df Residuals:	4987
Method:	MLE	Df Model:	12
Date:	Mon, 10 Aug 2020	Pseudo R-squ.:	0.5941
Time:	11:40:15	Log-Likelihood:	-641.66
converged:	True	LL-Null:	-1581.0
Covariance Type:	nonrobust	LLR p-value:	0.000

	coef	std err	z	P> z	[0.025	0.975]
const	-12.0645	1.650	-7.312	0.000	-15.298	-8.831
ID	-5.233e-05	5.14e-05	-1.018	0.309	-0.000	4.85e-05
Age	-0.0539	0.061	-0.878	0.380	-0.174	0.066
Experience	0.0640	0.061	1.050	0.294	-0.056	0.184
Income	0.0547	0.003	20.820	0.000	0.050	0.060
Family	0.6951	0.074	9.353	0.000	0.549	0.841
CCAvg	0.1218	0.040	3.069	0.002	0.044	0.200
Education	1.7406	0.115	15.101	0.000	1.515	1.966
Mortgage	0.0005	0.001	0.838	0.402	-0.001	0.002
Securities Account	-0.9449	0.286	-3.304	0.001	-1.506	-0.384
CD Account	3.8219	0.324	11.800	0.000	3.187	4.457
Online	-0.6717	0.157	-4.272	0.000	-0.980	-0.364
CreditCard	-1.1137	0.205	-5.430	0.000	-1.516	-0.712

The variables Income, Family, CCAvg, Education, Securities Account, CD Account, Online, CreditCard are deciding factors for Personal Loan with Income, Family, Education, CD Account, Online, CreditCard being the most deciding factors.