Attrition Case Study Logistic Results:

Taking out dependent variable:

```
In [94]: y = data['Attrition']
         y

Out[94]: 0       0
         1       1
         2       0
         3       0
         4       0
                ..
         4404    0
         4405    0
         4406    0
         4407    0
         4408    0
         Name: Attrition, Length: 4382, dtype: int64
```

Consider the independent variables:

```
In [95]: x = data[['Age','DistanceFromHome','Education','MonthlyIncome', 'NumCompaniesWorked', 'PercentSalaryHike','TotalWorkingYears',
                   'TrainingTimesLastYear', 'YearsAtCompany','YearsSinceLastPromotion', 'YearsWithCurrManager']]
         x
```

Out[95]:

	Age	DistanceFromHome	Education	MonthlyIncome	NumCompaniesWorked	PercentSalaryHike	TotalWorkingYears	TrainingTimesLastYear	YearsAtCompa
0	51	6	2	131160	1.0	11	1.0	6	
1	31	10	1	41890	0.0	23	6.0	3	
2	32	17	4	193280	1.0	15	5.0	2	
3	38	2	5	83210	3.0	11	13.0	5	
4	32	10	1	23420	4.0	12	9.0	2	
...	...	...	...	...	...	...	...	...	
4404	29	4	3	35390	1.0	18	6.0	2	
4405	42	5	4	60290	3.0	17	10.0	5	
4406	29	2	4	26790	2.0	15	10.0	2	
4407	25	25	2	37020	0.0	20	5.0	4	
4408	42	18	2	23980	0.0	14	10.0	2	

4382 rows × 11 columns

Importing Logistic Regression:

```
In [96]: import statsmodels.api as sm

In [97]: x1 = sm.add_constant(x)

In [100]: Logistic = sm.Logit(y,x1)

In [101]: result = Logisitic.fit()

          Optimization terminated successfully.
                   Current function value: 0.406686
                   Iterations 7

In [102]: result.summary()
```

Results:

Out[102]:

Logit Regression Results

Dep. Variable:	Attrition	No. Observations:	4382
Model:	Logit	Df Residuals:	4370
Method:	MLE	Df Model:	11
Date:	Mon, 10 Aug 2020	Pseudo R-squ.:	0.07809
Time:	12:12:56	Log-Likelihood:	-1782.1
converged:	True	LL-Null:	-1933.1
Covariance Type:	nonrobust	LLR p-value:	3.464e-58

	coef	std err	z	P>|z|	[0.025	0.975]
const	0.5019	0.330	1.520	0.129	-0.145	1.149
Age	-0.0354	0.007	-5.242	0.000	-0.049	-0.022
DistanceFromHome	-0.0027	0.005	-0.504	0.614	-0.013	0.008
Education	-0.0600	0.042	-1.441	0.150	-0.142	0.022
MonthlyIncome	-2.283e-06	9.38e-07	-2.435	0.015	-4.12e-06	-4.45e-07
NumCompaniesWorked	0.1087	0.018	6.022	0.000	0.073	0.144
PercentSalaryHike	0.0139	0.012	1.204	0.229	-0.009	0.037
TotalWorkingYears	-0.0556	0.012	-4.709	0.000	-0.079	-0.032
TrainingTimesLastYear	-0.1269	0.035	-3.671	0.000	-0.195	-0.059
YearsAtCompany	0.0028	0.018	0.152	0.879	-0.033	0.039
YearsSinceLastPromotion	0.1241	0.020	6.144	0.000	0.085	0.164
YearsWithCurrManager	-0.1268	0.022	-5.861	0.000	-0.169	-0.084

The variables Age, MonthlyIncome, NumCompaniesWorked, TotalWorkingYears, TrainingTimesLastYear, YearsSinceLastPromotion, YearsWithCurrManager are deciding factors for Attrition of an employee with, Age, NumCompaniesWorked, TotalWorkingYears, TrainingTimesLastYear, YearsSinceLastPromotion, YearsWIthCurrManager being the most deciding factors.