

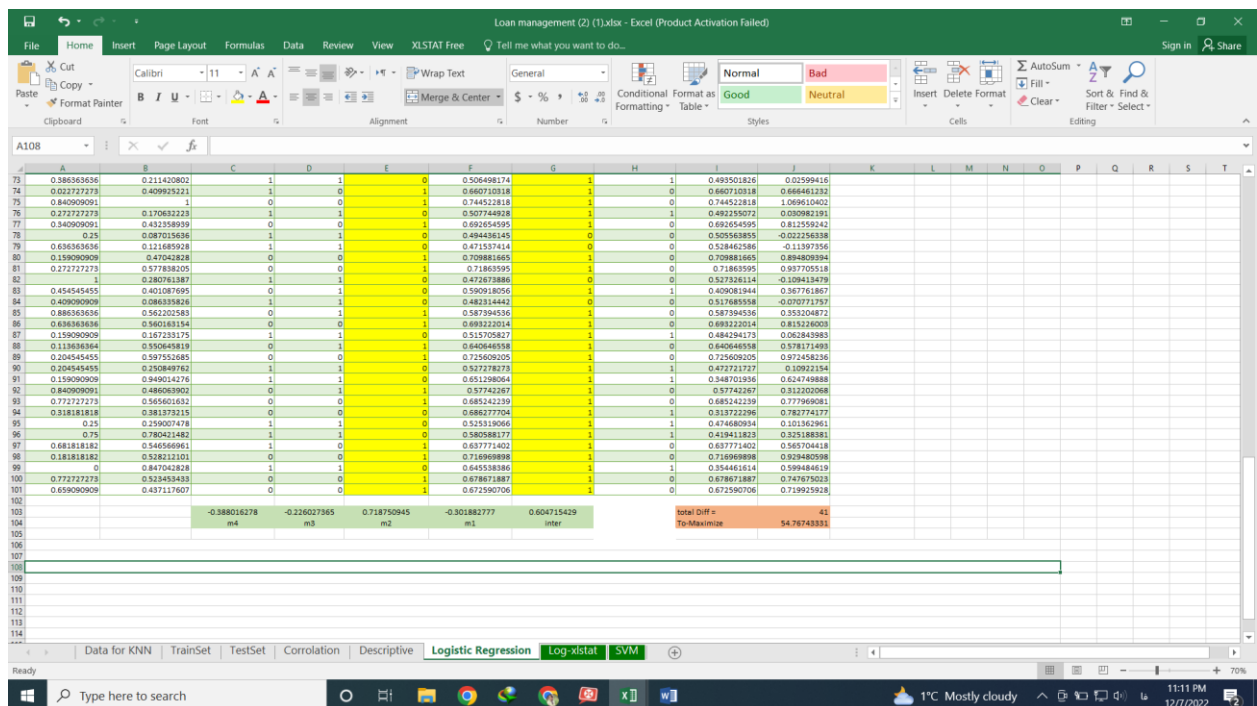
## Loan management

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	Age	Potential income	Bank Debt	Returned Check														
2																		
3	Mean	38.59	Mean	5230500	Mean	0.52	Mean	0.54										
4	Standard Error	1.34840684	Standard Error	315537.424	Standard Error	0.05021167	Standard Error	0.05009083										
5	Median	37.5	Median	5390000	Median	1	Median	1										
6	Mode	26	Mode	2560000	Mode	1	Mode	1										
7	Standard Deviation	13.4840684	Standard Deviation	315537.424	Standard Deviation	0.50211673	Standard Deviation	0.50090827										
8	Sample Variance	181.820101	Sample Variance	99564E+12	Sample Variance	0.25212121	Sample Variance	0.25090909										
9	Kurtosis	-1.29560256	Kurtosis	-0.03938737	Kurtosis	-2.03449441	Kurtosis	-2.014136										
10	Skewness	0.15410703	Skewness	0.39695127	Skewness	-0.08128852	Skewness	-0.16296927										
11	Range	44	Range	14710000	Range	1	Range	1										
12	Minimum	18	Minimum	40000	Minimum	0	Minimum	0										
13	Maximum	62	Maximum	14750000	Maximum	1	Maximum	1										
14	Sum	3859	Sum	523050000	Sum	52	Sum	54										
15	Count	100	Count	100	Count	100	Count	100										
16	Confidence Level(95.0%)	2.67553171	Confidence Level(95.0%)	626094.706	Confidence Level(95.0%)	0.09963085	Confidence Level(95.0%)	0.09939107										

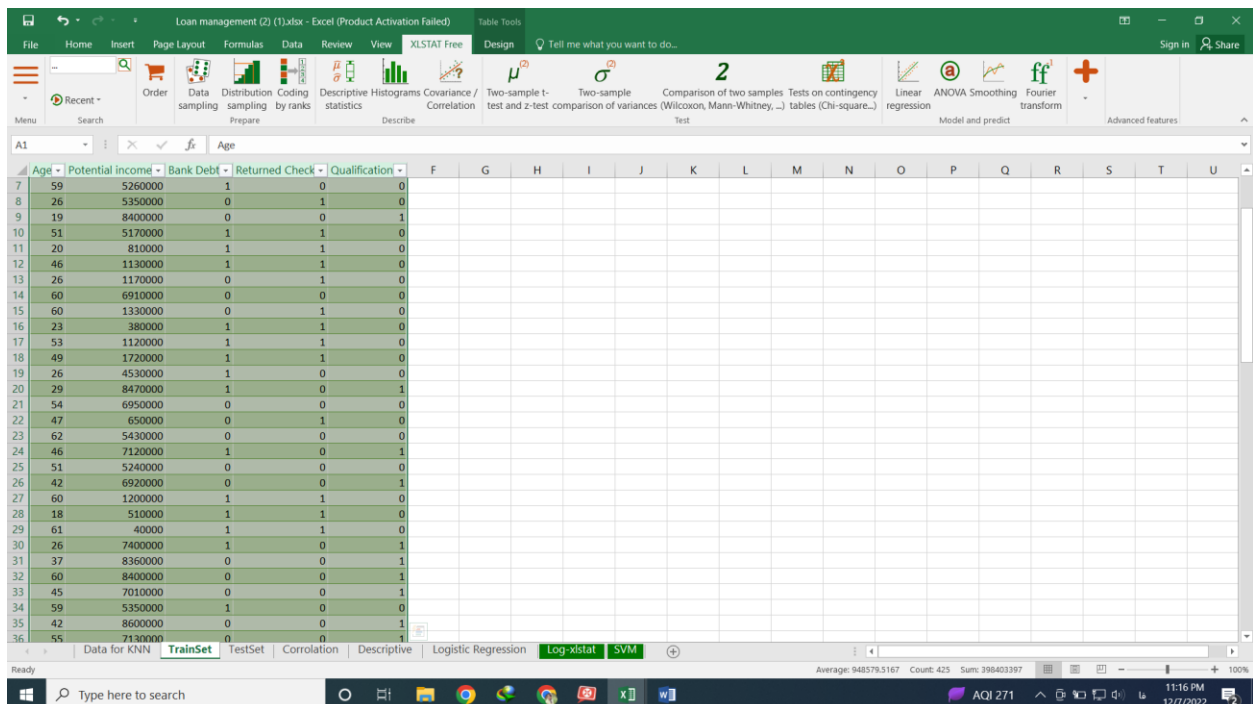
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	Age	Potential income	Bank Debt	Returned Check	Qualification	p1	OUTCOME	Diff	Propensity	model										
2	0.5	0.17879051	1	1	0	0.491893243	0	0	0.508308737	-0.033230007										
3	0.613636364	0.697484704	0	1	0	0.6301291	0	1	0.3698709	0.532770691										
4	0.362636364	0.22977568	1	0	0	0.60843681	1	0	0.391156309	0.434069984										
5	0.318181818	0.545887152	0	0	1	0.711158806	0	0	0.711158806	0.901018724										
6	0.25	0.242012327	1	1	0	0.522272156	1	1	0.477727844	0.089147815										
7	0.891818182	0.354860639	1	0	0	0.587102049	0	1	0.412789732	0.352444623										
8	0.181818182	0.360978926	0	1	0	0.603785689	0	1	0.386214011	0.412185317										
9	0.022727273	0.56831087	0	0	1	0.732302412	1	0	0.732302412	1.006355619										
10	0.75	0.348742352	1	1	0	0.50372959	1	1	0.49627042	0.014918598										
11	0.045454545	0.05234543	1	1	0	0.505643212	1	1	0.49627042	0.014573107										
12	0.636363636	0.074099252	1	1	0	0.463023469	0	0	0.538876501	-0.148176528										
13	0.181818182	0.076818491	0	1	0	0.554044218	1	1	0.445955772	0.17024756										
14	0.954545455	0.467079322	0	0	0	0.637913329	0	1	0.362186871	0.632132398										
15	0.954545455	0.087695445	0	1	0	0.497892388	0	0	0.502107812	-0.008430498										
16	0.136363636	0.023113928	1	1	0	0.498124536	0	0	0.50878464	-0.027020205										
17	0.795454545	0.073419443	1	1	0	0.505849313	1	0	0.540052051	-0.196691948										
18	0.704545455	0.114208022	1	1	0	0.465074184	0	0	0.534925836	-0.139931228										
19	0.181818182	0.305234534	1	0	0	0.632553692	1	1	0.367446308	0.543187896										
20	0.25	0.373079538	1	0	1	0.671351248	0	0	0.671351248	0.715118829										
21	0.181818182	0.469714697	0	0	0	0.667156577	0	1	0.332848423	0.69555286										
22	0.659090909	0.041468389	0	1	0	0.511881863	1	1	0.488118137	0.0475364										
23	1	0.366417403	0	0	0	0.637884845	1	1	0.362115155	0.566195506										
24	0.636363636	0.48138235	1	0	1	0.630070538	0	0	0.630070538	0.552519434										
25	0.75	0.3530102	0	0	0	0.653029499	1	1	0.346970501	0.632382538										
26	0.545454545	0.467709041	0	0	1	0.684864513	1	0	0.684864513	0.776318411										
27	0.954545455	0.07885782	1	1	0	0.420287677	1	0	0.559512113	-0.240808842										
28	0	0.031951054	1	1	0	0.503490106	1	1	0.496590894	0.013636636										
29	0.977272727	0	0	1	1	0.424484431	0	0	0.575059569	-0.304350019										
30	0.181818182	0.020319909	0	0	1	0.646501399	0	0	0.664501399	0.684210086										
31	0.431818182	0.565601632	0	0	0	0.707005304	1	0	0.707005304	0.88083664										
32	0.954545455	0.56831087	0	0	1	0.67371489	1	0	0.67371489	0.723039578										
33	0.613636364	0.473827328	0	0	1	0.681360903	0	0	0.681360903	0.760035219										
34	0.931818182	0.360978926	1	0	0	0.588275799	1	1	0.411724207	0.356842148										
35	0.545454545	0.581917063	0	0	1	0.70230651	0	0	0.70230651	0.858305535										
36	0.840909091	0.481985044	0	0	1	0.667385918	1	0	0.667385918	0.697286665										
37	0.636363636	0.134602311	1	1	0	0.473851404	0	0	0.526148596	-0.104688897										
38	0.363636363	0.442550804	0	1	1	0.620959057	1	0	0.620959057	0.493620921										
39	0.454545455	0.110129164	1	0	0	0.579476333	1	1	0.420523667	0.32062406										
40	0.431818182	0.084976207	0	1	0	0.536787754	0	1	0.463212246	0.147474607										
41	0.727272727	0.496261047	1	0	1	0.626171006	1	0	0.626171006	0.51582505										
42	0.204545455	0.227086424	1	1	0	0.523018741	1	1	0.478988259	0.092120056										

در این مسئله هم ابتدا گام های پیش پردازش داده انجام شده و داده ها هم مقیاس میشوند . سپس چون این مسئله از نوع طبقه بندی میباشد باید از روش های طبقه بندی مانند svm, linear reg ... استفاده نمود

بعد محاسبه شیب خط ها از تابع lineest و محاسبه ی معادله به جمع 41 خط از مجموع ۱۰۱ داده میرسیم



سپس از طریق افزونه xlstat اقدام به دسته بندی و طبقه بندی دادگان مینماییم در این تمرین ما ۸۵ داده را بصورت رندوم بعوان مجموعه آموزش و ۱۶ داده را به عنوان مجموعه test در نظر گرفته ایم که بعد از اعمال روش های دسته بندی نتایج ذیل حاصل شد که حاکی از درصد درستی بالایی مدل میباشد



## طبقه بندی svm

The screenshot shows the XLSTAT interface with the 'SVM' tab selected. The worksheet displays classification results for a validation sample and a prediction sample.

**Classification for the validation sample (Qualification - 0 / 1):**

Obs	Predicted class	True class
Obs17	0	0
Obs20	1	0
Obs22	0	0
Obs28	0	0
Obs29	1	1
Obs31	1	1
Obs43	0	0
Obs61	0	0
Obs77	0	0
Obs78	0	0

**Classification for the prediction sample (Qualification - 0 / 1):**

PredObs	Predicted class
PredObs1	1
PredObs2	0
PredObs3	1
PredObs4	1
PredObs5	0
PredObs6	1
PredObs7	0
PredObs8	1
PredObs9	1
PredObs10	0
PredObs11	1

## طبقه بندی linear regression

The screenshot shows the XLSTAT interface with the 'Log-Linear' tab selected. The worksheet displays predictions for new observations using linear regression.

**Predictions for the new observations (Variable Qualification):**

Observation	Pred(Qualification)	Independent	Lower bound 95%	Upper bound 95%
PredObs1	1.000	0.348	0.000	1.000
PredObs2	0.000	0.348	0.000	1.000
PredObs3	1.000	0.348	0.000	1.000
PredObs4	1.000	0.348	0.000	1.000
PredObs5	0.000	0.348	0.000	1.000
PredObs6	1.000	0.348	0.000	1.000
PredObs7	1.000	0.348	0.000	1.000
PredObs8	1.000	0.348	0.000	1.000
PredObs9	0.000	0.348	0.000	1.000
PredObs10	0.000	0.348	0.000	1.000
PredObs11	1.000	0.348	0.000	1.000
PredObs12	1.000	0.348	0.000	1.000
PredObs13	1.000	0.348	0.000	1.000
PredObs14	1.000	0.348	0.000	1.000
PredObs15	1.000	0.348	0.000	1.000
PredObs16	0.000	0.348	0.000	1.000

نمای کلی از نتایج اکتسابی

Loan management (2) (2).xlsx - Excel (Product Activation Failed)																			
File Home Insert Page Layout Formulas Data Review View XLSTAT Free Design Tell me what you want to do...																			
Clipboard Font Alignment Number Conditional Formatting Styles Cells Editing																			
15 = ABS([@Qualification]) - [P[Predicted class]]																			
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q		
		Potential Income	Bank Debt	Returned Check	Qualification	Pred(Qualification)	error logistic reg	Predicted class	error SVM										
2	46	8280000	0	0	1	1.000	0.000	1	0.000										
3	25	2500000	1	1	0	0.000	0.000	0	0.000										
4	23	8140000	0	1	1	1.000	0.000	1	0.000										
5	27	8830000	0	0	1	1.000	0.000	1	0.000										
6	27	3730000	1	1	0	0.000	0.000	0	0.000										
7	25	14000000	1	1	0	1.000	1.000	1	1.000										
8	55	7190000	0	1	1	1.000	0.000	0	1.000										
9	52	8360000	0	0	1	1.000	0.000	1	0.000										
10	32	5650000	0	0	0	0.000	0.000	1	1.000										
11	29	3850000	1	1	0	0.000	0.000	0	0.000										
12	51	11520000	1	1	0	1.000	1.000	1	1.000										
13	48	8080000	1	0	1	1.000	0.000	1	0.000										
14	26	7810000	0	0	1	1.000	0.000	1	0.000										
15	18	12500000	1	1	0	1.000	1.000	1	1.000										
16	52	7740000	0	0	1	1.000	0.000	0	0.000										
17	47	6470000	0	0	1	0.000	1.000	1	0.000										
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Data for KNN TrainSet TestSet Correlation Descriptive Logistic Regression Log-xistat SVM																			

خطاهای مدل برحسب خطای MSE ارزیابی شده است.