Introduction to Credit scorecards

Github: https://github.com/Py4Econmn/credit_scorecard_toy.git

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Binning, WOE and IV

$$WOE_i = ln(\frac{\%\text{ of Non-Events}_i}{\%\text{ of Events}_i})$$

$$IV = \sum_{i}^{bins}(\%\text{ of Non-Events - }\%\text{ of Events}) \times WOE_i$$

Range	Bins	Non events	Events	% of Non-Events	% of Events	WOE	IV
0-50	1	197	20	5.4%	5.9%	-0.0952	0.0005
51-100	2	450	34	12.3%	10.1%	0.2002	0.0045
101-150	3	492	39	13.4%	11.5%	0.1522	0.0029
151-200	4	597	51	16.3%	15.1%	0.0774	0.0009
201-250	5	609	54	16.6%	16.0%	0.0401	0.0003
251-300	6	582	55	15.9%	16.3%	-0.0236	0.0001
301-350	7	386	41	10.5%	12.1%	-0.1405	0.0022
351-400	8	165	23	4.5%	6.8%	-0.4123	0.0095
>401	9	184	21	5.0%	6.2%	-0.2123	0.0025
	Total	**3662**	**338**				**0.0234**

Score

$$Score\_points_i = \frac{OFFSET}{n} - Factor \times (WOE_i \times \beta_i + \frac{\beta_0}{n})$$

$$Score = \sum_{i=1}^{n} Score\_points_i$$

$$= \sum_{i=1}^{n} (\frac{OFFSET}{n} - Factor \times (WOE_i \times \beta_i + \frac{\beta_0}{n}))$$

$OFFSET = TargetScore + Factor \times ln(TargetOdds)$, $Factor = \frac{PDO}{ln(2)}$, TargetOdds - Odds ratio to use as the scaling center, TargetScore - Score when the odds ratio is at the TargetOdds, PDO - Points to double the odds (points needed to double the odds), n - number of independent variables (excluding the intercept β_0)

Thank you!