Campaign Response Model

การปรับโมเดลโดยการจูนพารามิเตอร์ บางครั้งอาจไม่ช่วยให้ *model* แม่นยำ มากขึ้น แต่การปรับ *feature* โดยการลด *feature* ที่ไม่จำเป็น หรือ สร้าง *feature* ใหม่ จาก *feature* ที่มีอยู่ อาจจะช่วยทำให้ *model* มีความแม่นยำมากขึ้น

Reference : Sukit

Original code vs. New code comparison

logistic regression model - SMOTE
training set

	precision	recall	f1-score	support
0	0.68	0.62	0.65	4389
1	0.65	0.71	0.68	4389
accuracy			0.67	8778
macro avg	0.67	0.67	0.67	8778
weighted avg	0.67	0.67	0.67	8778

test set

	precision	recall	f1-score	support
0	0.95	0.63	0.75	1848
1	0.18	0.71	0.29	218
accuracy			0.64	2066
macro avg	0.57	0.67	0.52	2066
weighted avg	0.87	0.64	0.71	2066

logistic regression model - undersampled
training set

	precision	recall	f1-score	support
0	0.68	0.63	0.65	429
1	0.66	0.70	0.68	429
accuracy			0.67	858
macro avg	0.67	0.67	0.67	858
weighted avg	0.67	0.67	0.67	858

test set

	precision	recall	f1-score	support
0	0.95	0.62	0.75	1848
1	0.19	0.72	0.29	218
accuracy			0.63	2066
macro avg	0.57	0.67	0.52	2066
weighted avg	0.87	0.63	0.70	2066

Original code vs. New code comparison

```
XGBoost model - SMOTE - parameter tuning
[0]      validation_0-auc:0.611373
Will train until validation_0-auc hasn't improved in 5 rounds.
[1]      validation_0-auc:0.733395
[2]      validation_0-auc:0.728699
[3]      validation_0-auc:0.738274
[4]      validation_0-auc:0.738525
[5]      validation_0-auc:0.732941
[6]      validation_0-auc:0.740621
[7]      validation_0-auc:0.741142
[8]      validation_0-auc:0.740015
[9]      validation_0-auc:0.739549
[10]     validation_0-auc:0.741946
[11]     validation_0-auc:0.737816
[12]     validation_0-auc:0.738247
[13]     validation_0-auc:0.737253
[14]     validation_0-auc:0.736756
[15]     validation_0-auc:0.736153
Stopping. Best iteration:
[10]     validation_0-auc:0.741946
```

```
XGBoost model - SMOTE - parameter tuning
[0]      validation_0-auc:0.675002
Will train until validation_0-auc hasn't improved in 5 rounds.
[1]      validation_0-auc:0.69401
[2]      validation_0-auc:0.717146
[3]      validation_0-auc:0.717519
[4]      validation_0-auc:0.729833
[5]      validation_0-auc:0.737114
[6]      validation_0-auc:0.736862
[7]      validation_0-auc:0.732843
[8]      validation_0-auc:0.732597
[9]      validation_0-auc:0.730563
[10]     validation_0-auc:0.734865
Stopping. Best iteration:
[5]      validation_0-auc:0.737114
```

Original code vs. New code comparison

logistic regression model - undersampled
training set

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weighted avg	0.87	0.62	0.69	2066

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