Validation and overfitting

Restaurant Revenue Prediction

Predict annual restaurant sales based on objective measurements

$30,000 · 2,257 teams · 2 years ago

Public Leaderboard Private Leaderboard

This leaderboard is calculated with approximately 30% of the test data.

The final results will be based on the other 70%, so the final standings may be different.

Raw Data Refresh

#	Δpriv	Team Name	Kernel	Team Members	Score	Entries	Last
1	▼ 19...	BAYZ, M.D.			0.00000	115	2y
2	▼ 16...	Will Iam			710063.76...	116	2y
3	▼ 10...	Scott Lowe			1462479.4...	106	2y
4	▼ 935	AMAR_PREM_AnandAkela_Teja			1464692.1...	97	2y
5	▼ 683	Analytic Bastard			1492787.0...	115	2y

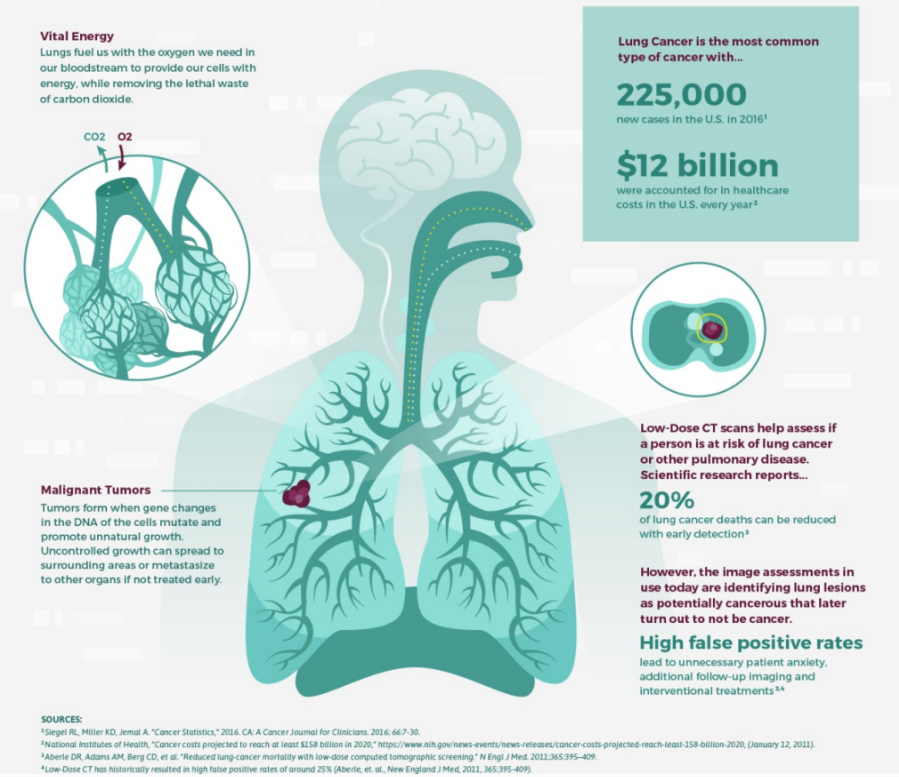
Next videos

1. We will understand the concept of validation and overfitting
2. We will identify the number of splits that should be done to establish stable validation
3. We will break down most frequent ways to repeat train test split
4. We will discuss most often validation problems

Validation: example

DATA SCIENCE BOWL

Passion. Curiosity. Purpose.



Validation: example

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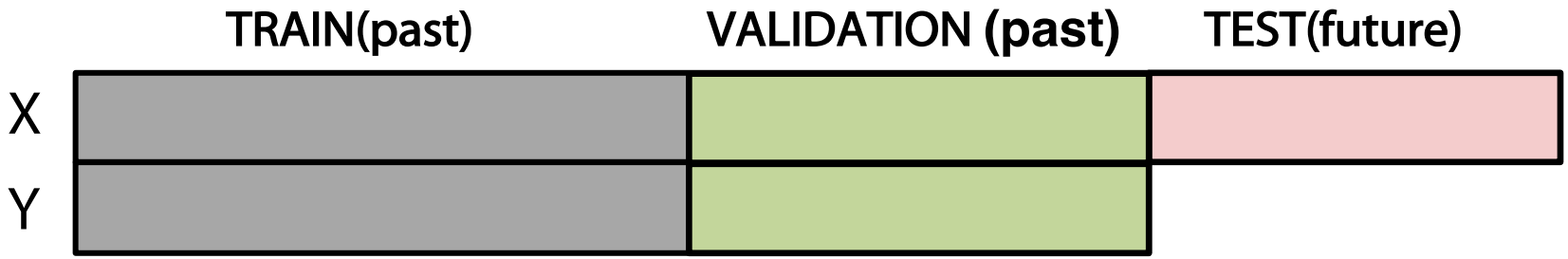
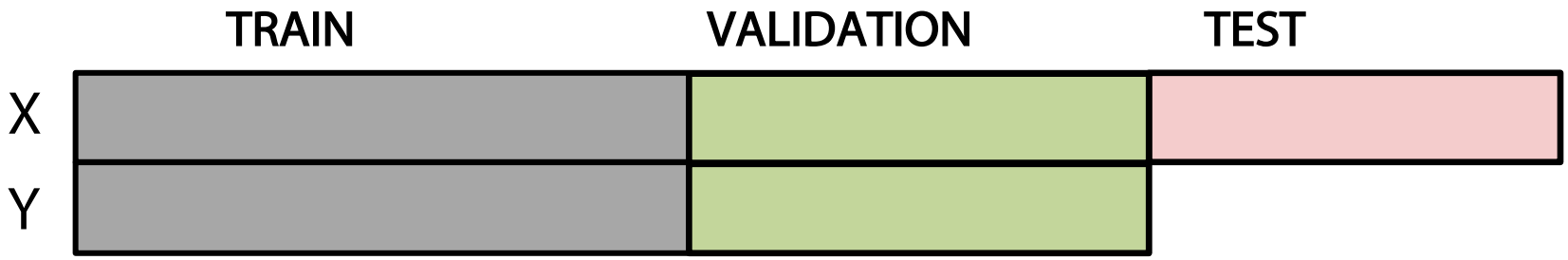
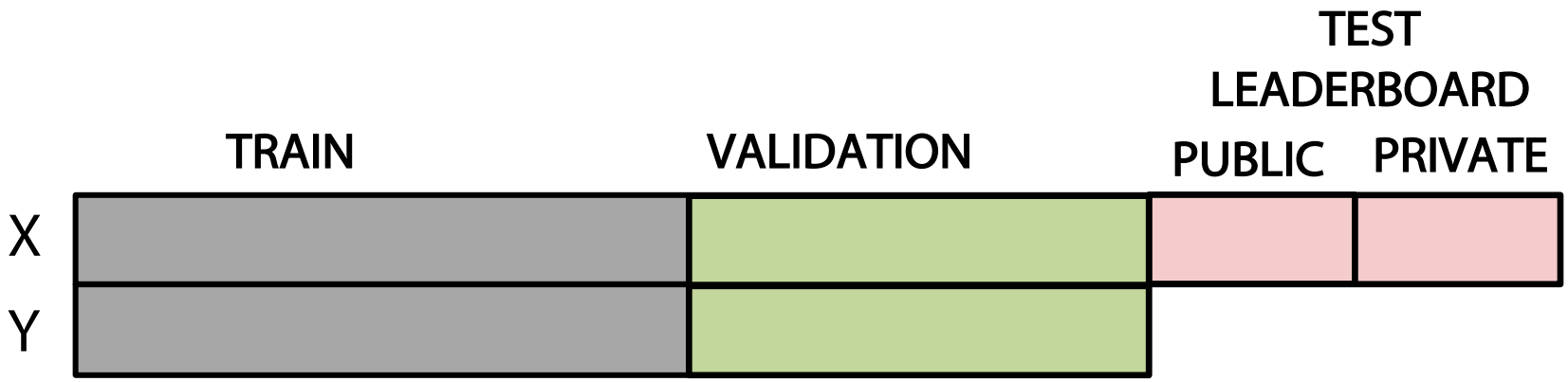


Validation: competitions

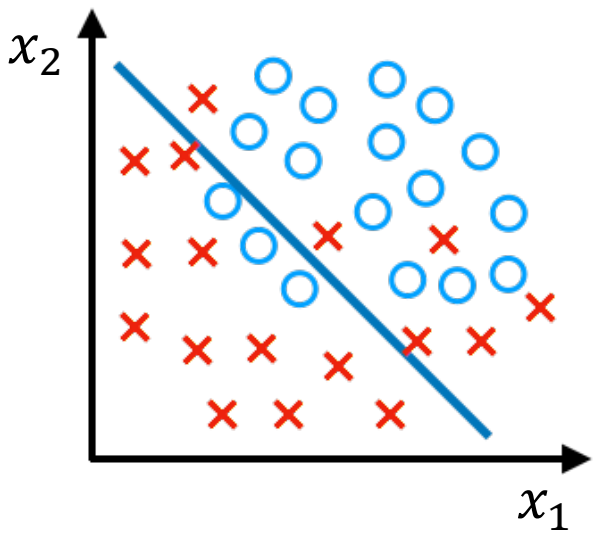


Validation: competitions



Validation: underfitting and overfitting

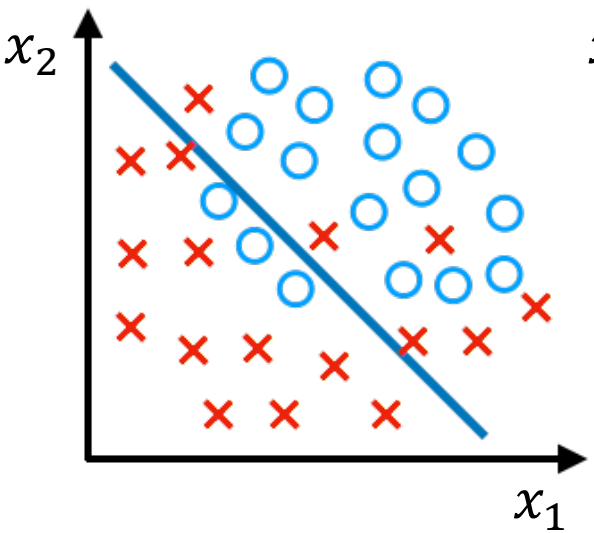
UNDERFITTING

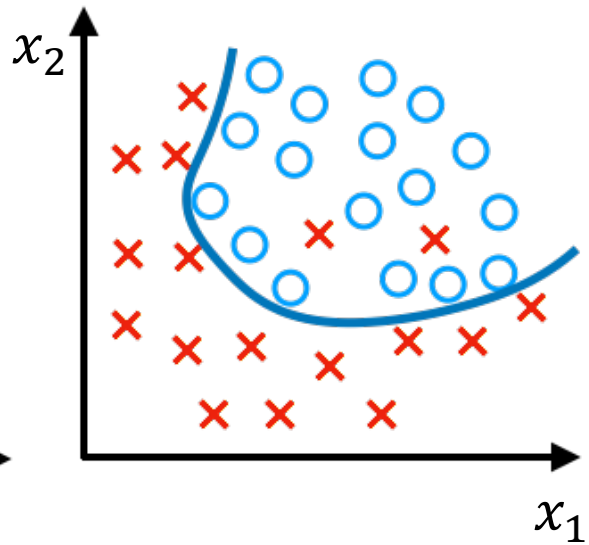


$$h_\theta(x) = g(\theta_0 + \theta_1 x_1 + \theta_2 x_2)$$
$$(g = sigmoid\ function)$$

Validation: underfitting and overfitting

UNDERFITTING



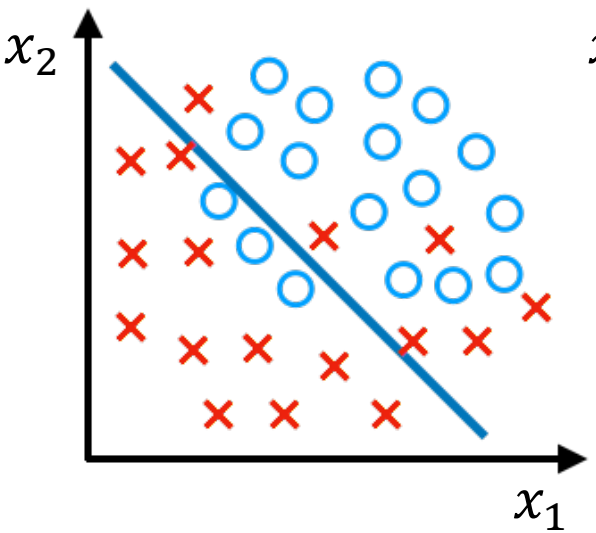


$h_\theta(x) = g(\theta_0 + \theta_1 x_1 + \theta_2 x_2)$
$(g = sigmoid\ function)$

$g(\theta_0 + \theta_1 x_1 + \theta_2 x_2$
$+\theta_3 x_1^2 + \theta_4 x_2^2$
$+\theta_5 x_1 x_2)$

Validation: underfitting and overfitting

UNDERFITTING



$h_\theta(x) = g(\theta_0 + \theta_1 x_1 + \theta_2 x_2)$
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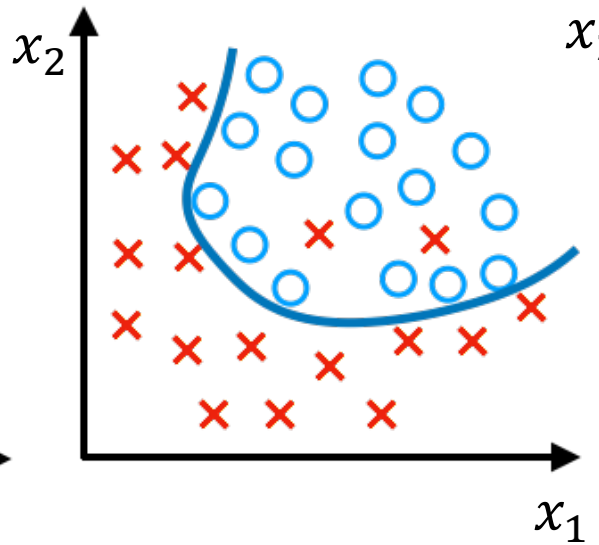
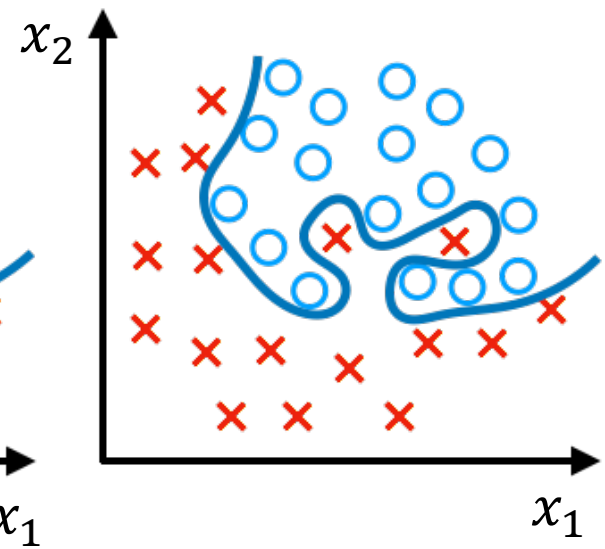


$g(\theta_0 + \theta_1 x_1 + \theta_2 x_2$
$+\theta_3 x_1^2 + \theta_4 x_2^2$
$+\theta_5 x_1 x_2)$

OVERFITTING



$g(\theta_0 + \theta_1 x_1 + \theta_2 x_1^2$
$+\theta_3 x_1^2 x_2 + \theta_4 x_1^2 x_2^2$
$+\theta_5 x_1^2 x_2^3 + \theta_6\, x_1^3 x_2)$

Validation: underfitting and overfitting

Overfitting in general != overfitting in competitions

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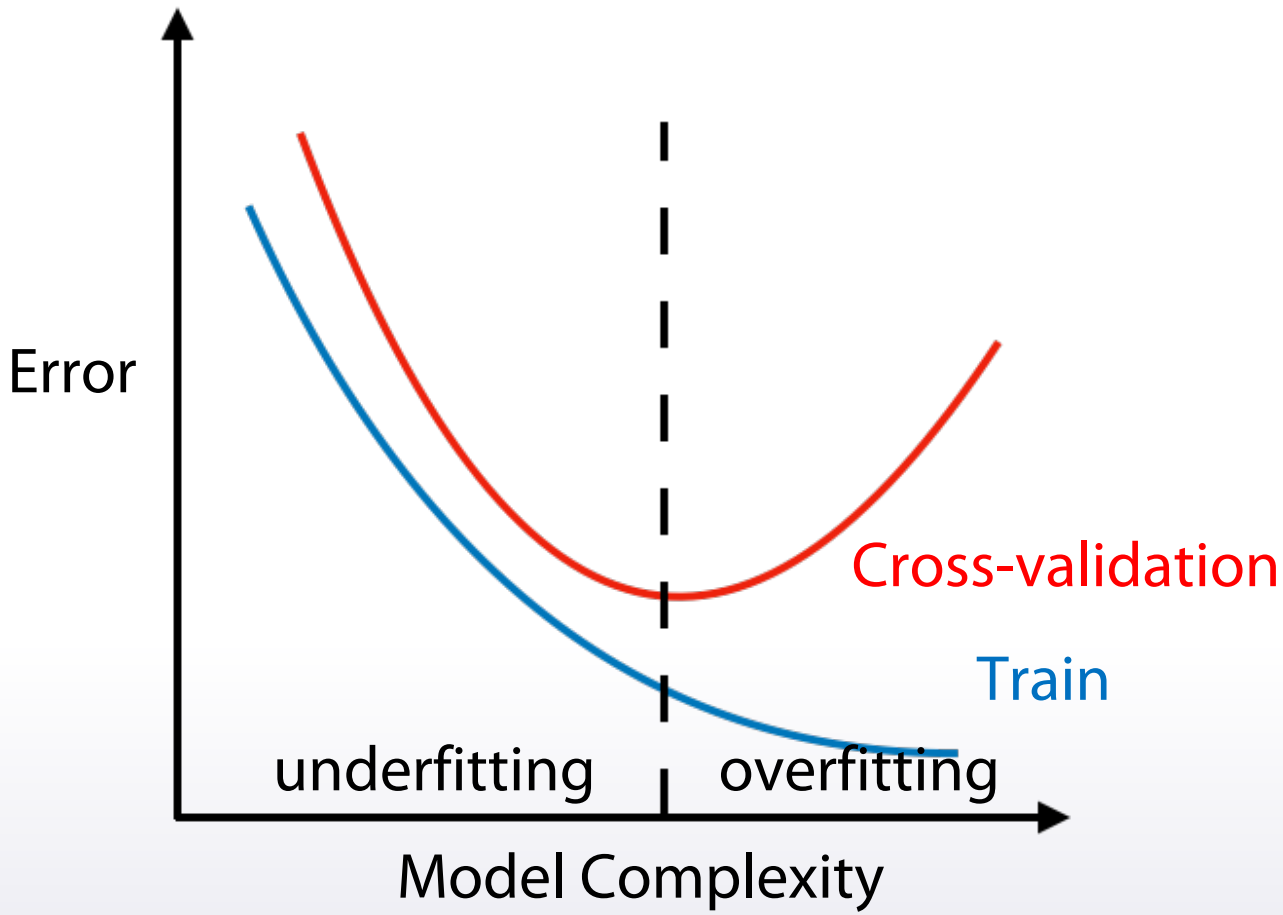

Conclusion

1. Validation helps us evaluate a quality of the model
2. Validation helps us select the model which will perform best on the unseen data
3. Underfitting refers to not capturing enough patterns in the data
4. Generally, overfitting refers to
    a. capturing noize
    b. capturing patterns which do not generalize to test data
5. In competitions, overfitting refers to
    a. low model's quality on test data,
    which was unexpected due to validation scores