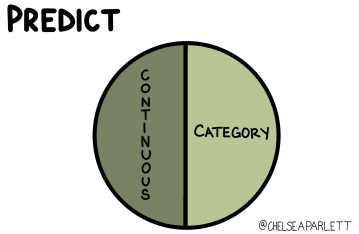
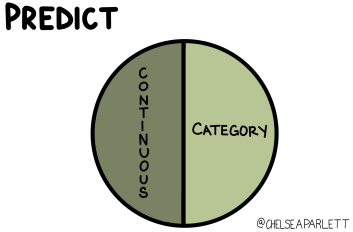


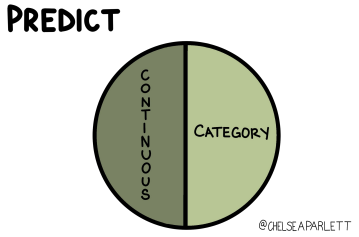
Logistic Regression

Chelsea Parlett-Pelleriti

Linear Regression in Disguise



Predictions



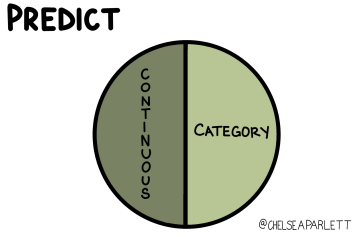
Linear

Continuous Variable (can be -∞ to ∞)

Logistic

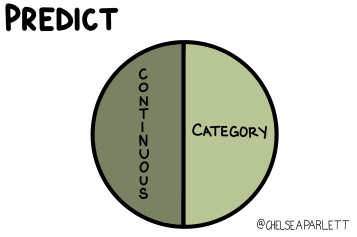
Binary Categorical Variable (can be 0 or 1)

Getting from Binary to Continuous



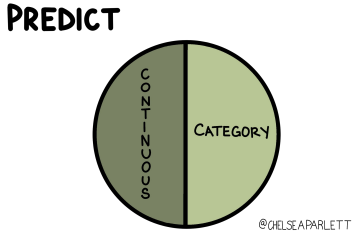
1. Predict Probabilities
2. Convert Probabilities to Odds
3. Convert Odds to Log Odds

Getting from Binary to Continuous

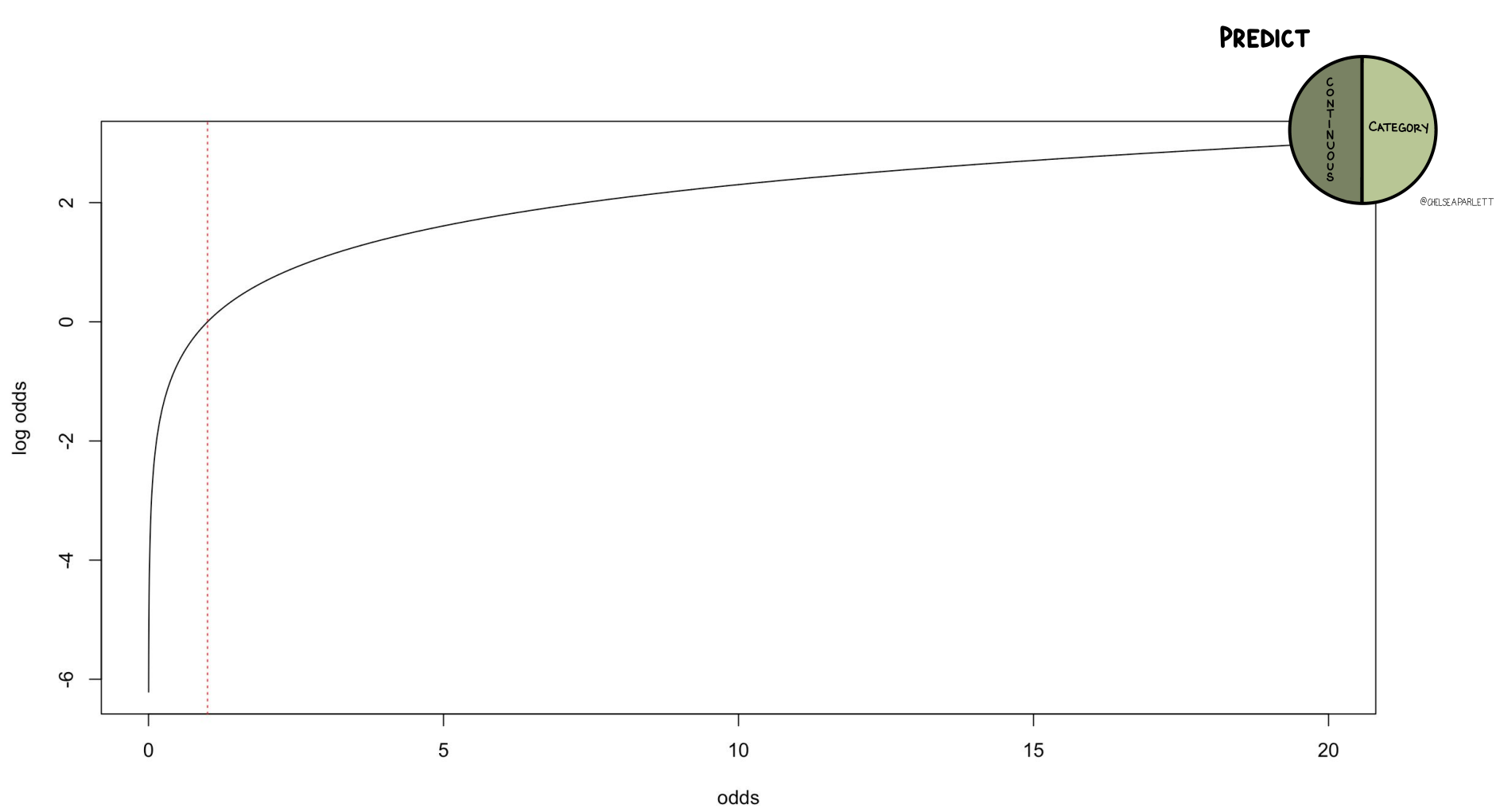


1. Predict Probabilities
2. Convert Probabilities to Odds
3. Convert Odds to Log Odds

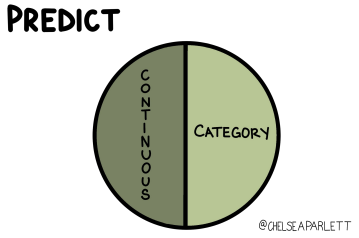
Getting from Binary to Continuous



1. Predict Probabilities
2. Convert Probabilities to Odds
3. Convert Odds to Log Odds

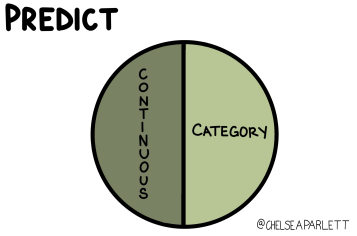

PREDICT
CONTINUOUS
CATEGORY
@CHELSEAPARLETT
log odds
2
0
-2
-4
-6
0
5
10
15
20
odds

Getting from Binary to Continuous



1. Predict Probabilities
2. Convert Probabilities to Odds
3. Convert Odds to Log Odds

The Final Formula



$$\log(p/1-p) = mx + b$$

All the Steps

Probability p	**Odds** (p/1-p)	**Log Odds** log((p/1-p))
0.1	0.1111	-2.1972
0.5	1	0
0.9	9	2.1972

Doing LR in Python (Inference)

	coef	std err	z	P>|z|	[0.025	0.975]
const	-2.9777	2.781	-1.071	0.284	-8.427	2.472
age	0.1445	0.073	1.977	0.048	0.001	0.288
income	-0.0066	0.017	-0.397	0.691	-0.039	0.026
months_subbed	0.0015	0.016	0.089	0.929	-0.030	0.033