

# **Automated, Weighted, Monotonic Weight of Evidence (WoE) Transformation Module in Credit Risk Modeling**

# A Numerical Example Demonstrating WoE

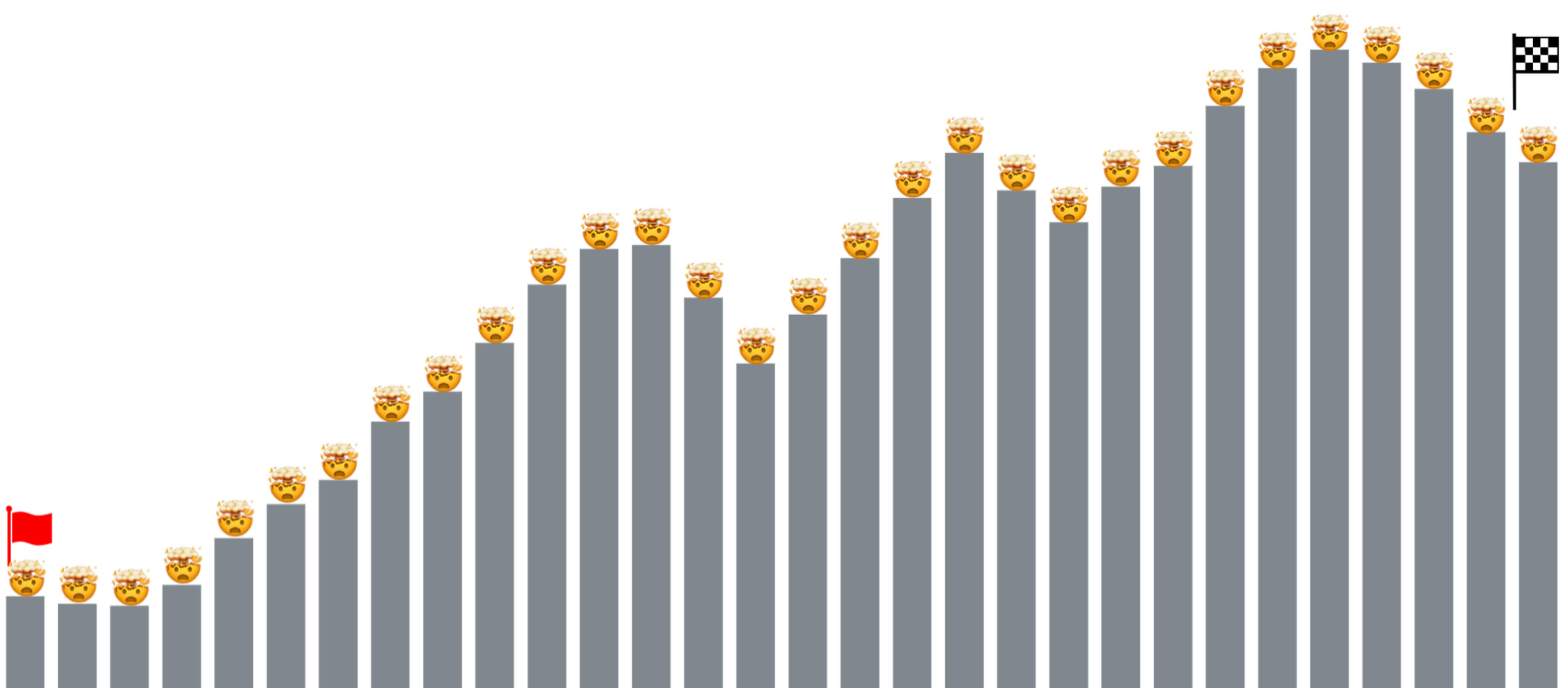
Bin	Range	# Non-Event (# Good)	# Event (# Bad)	% Non-Event (% Good)	% Event (% Bad)	WoE	IV
1	<50	497	20	11.09%	2.67%	1.4253	0.1201
2	51-100	485	34	10.82%	4.53%	0.8703	0.0547
3	101-150	492	39	10.98%	5.20%	0.7474	0.0432
4	151-200	472	51	10.53%	6.80%	0.4376	0.0163
5	201-250	468	64	10.44%	8.53%	0.2021	0.0039
6	251-300	445	80	9.93%	10.67%	-0.0715	0.0005
7	301-350	425	95	9.48%	12.67%	-0.2893	0.0092
8	351-400	421	107	9.40%	14.27%	-0.4177	0.0203
9	401-450	398	120	8.88%	16.00%	-0.5886	0.0419
10	>450	378	140	8.44%	18.67%	-0.7943	0.0813
Total		4481	750				0.3915



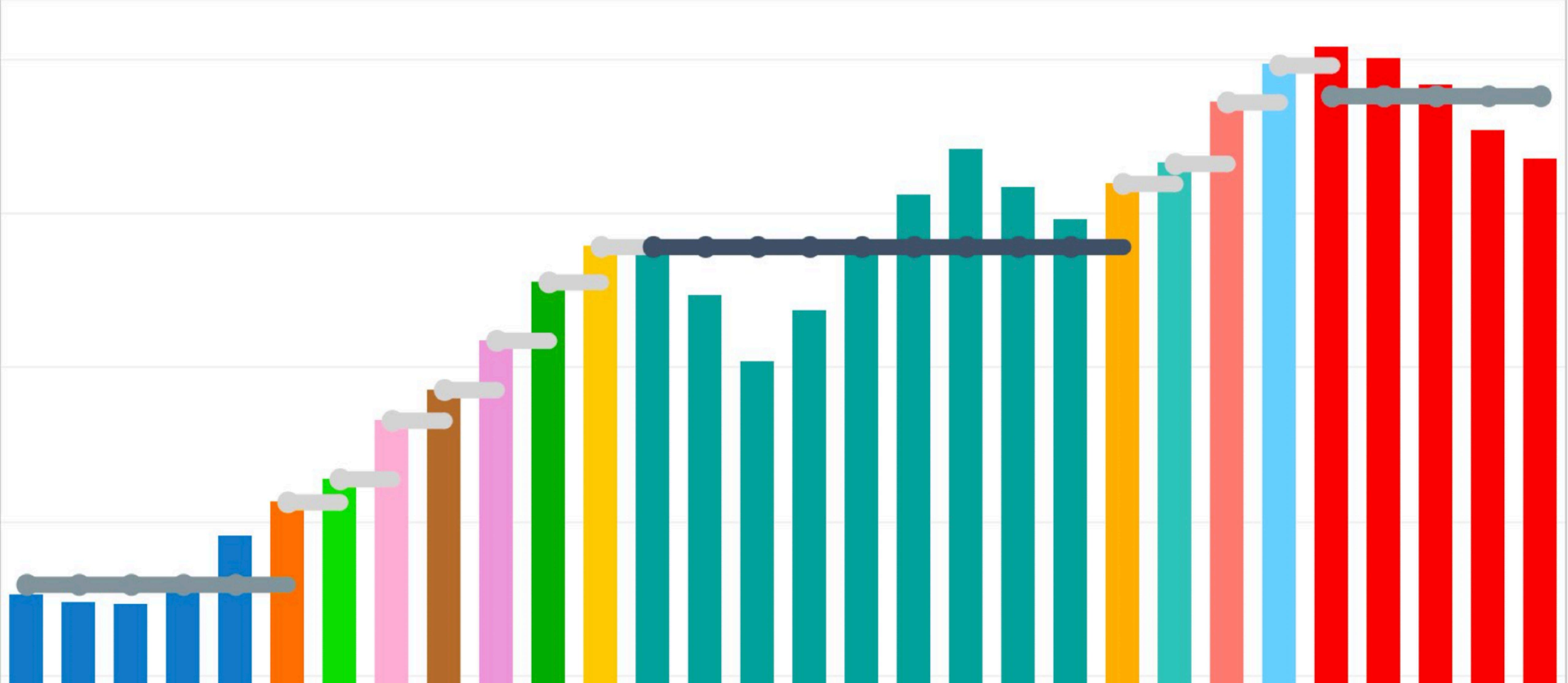
# Introduction to the WoE Algorithm



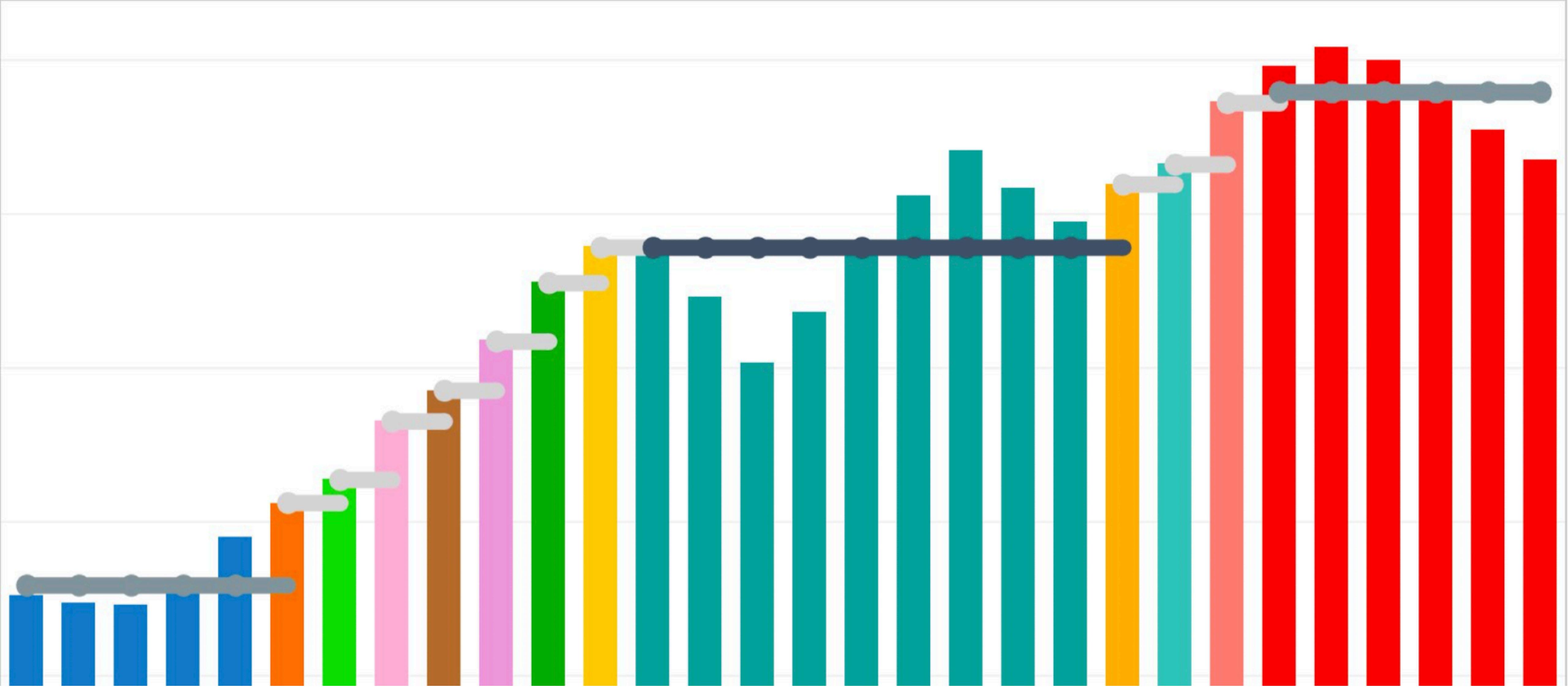
Identifying the Trend



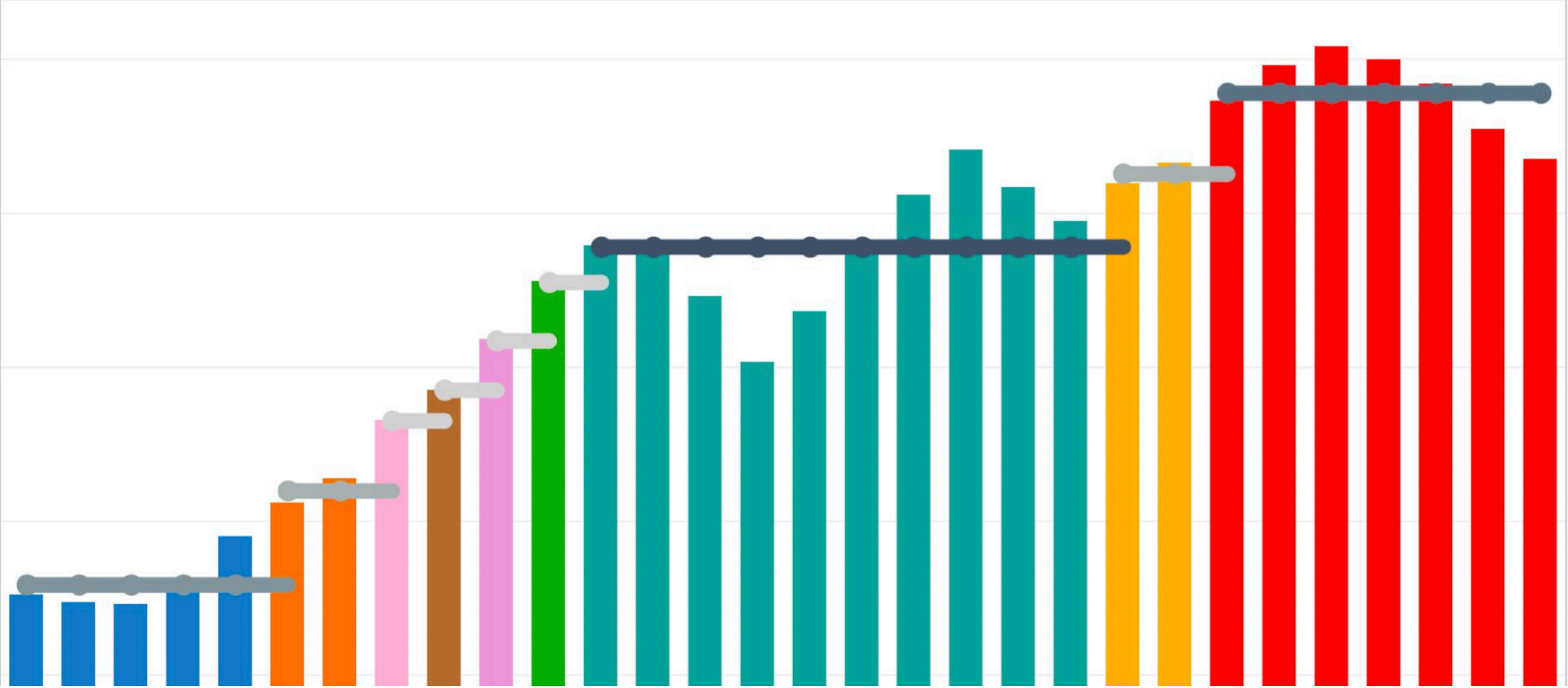
Sampling the Data: Running the Algorithm from Left to Right



Initializing the WoE Bins



Backtracking to Ensure Monotonicity

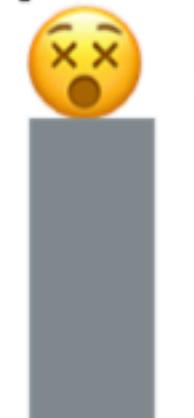
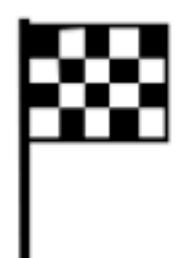


Combining Bins to Ensure Sufficient Data

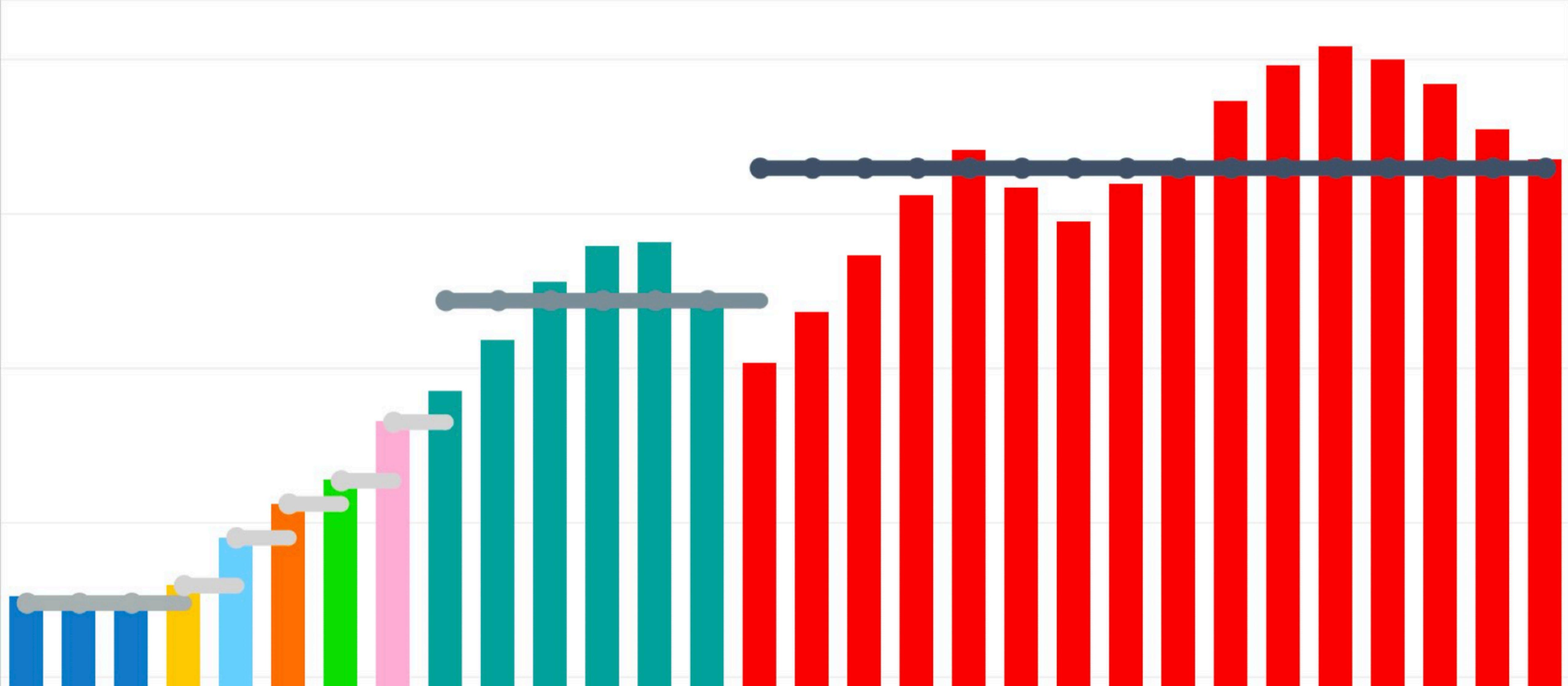


Final Result: Forward Pass

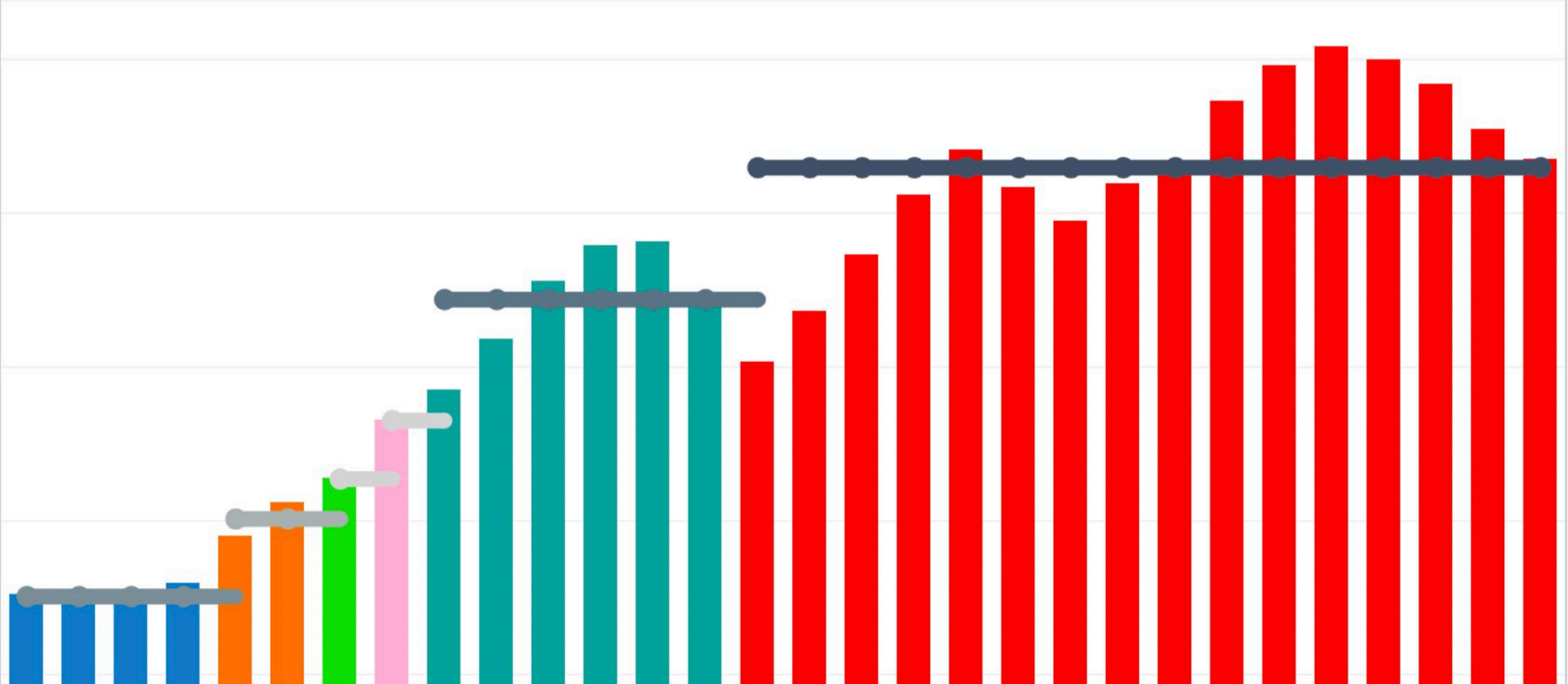




Sampling the Data: Running the Algorithm in Reverse



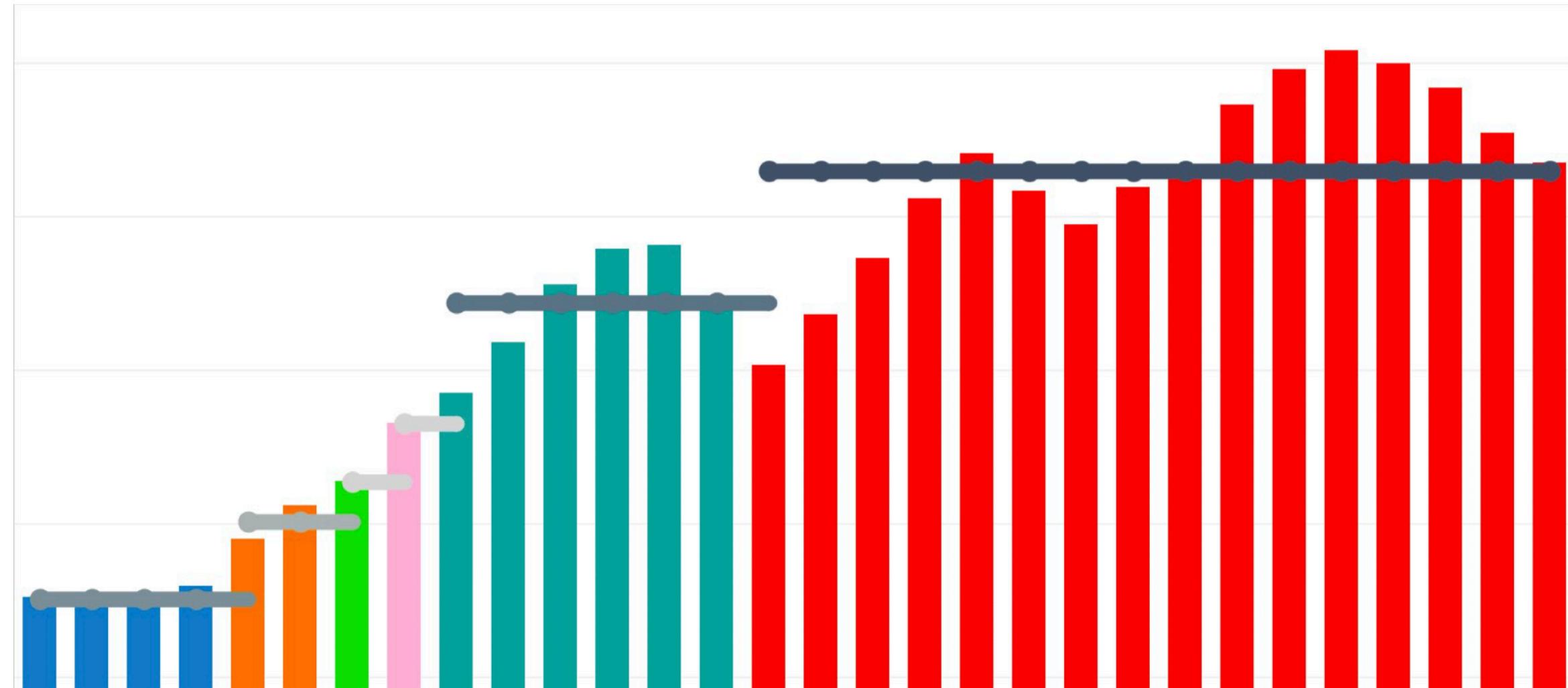
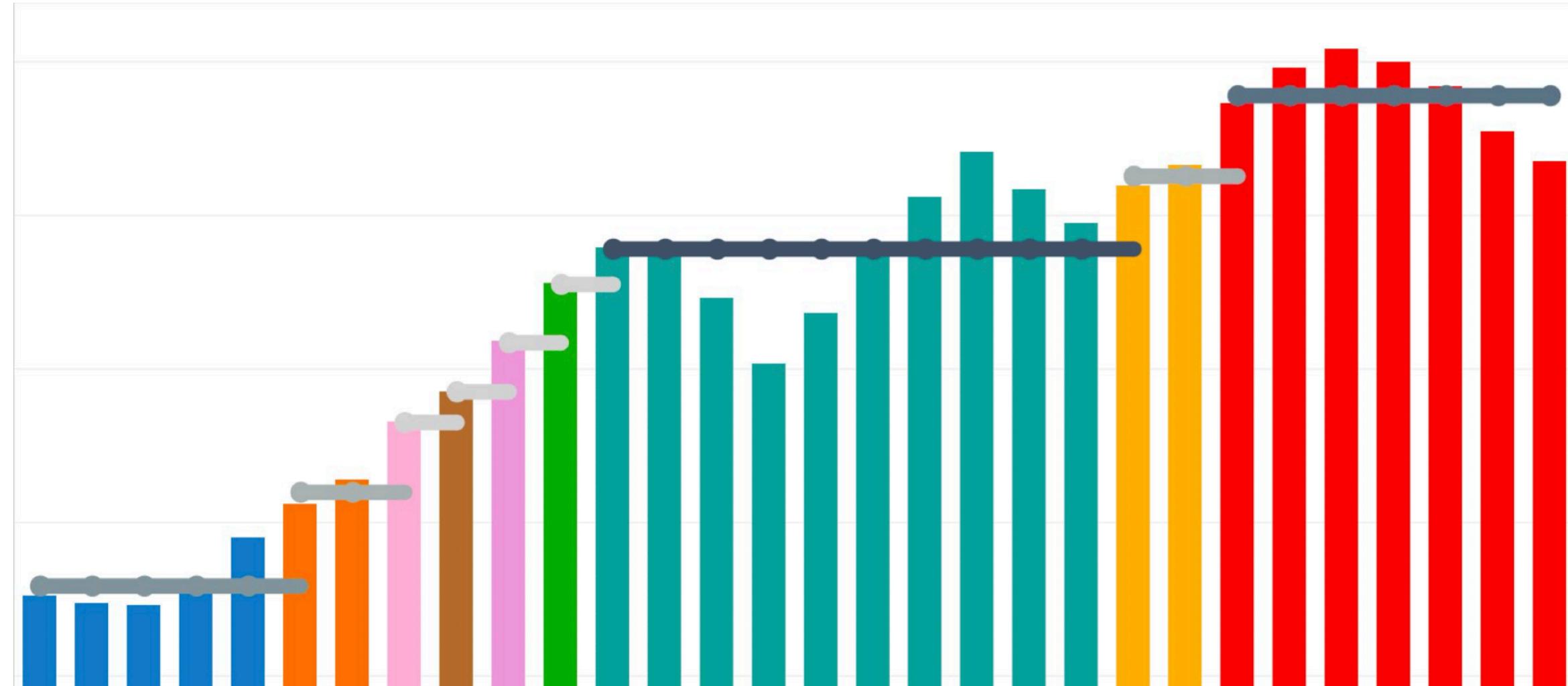
Initializing the WoE Bins



# Combining Bins to Ensure Sufficient Data



Final Result - Reverse Direction



Comparing Forward & Backward Results

# Comparison of Logistic Regression, 10-Bin WoE, and 3-Bin WoE

