

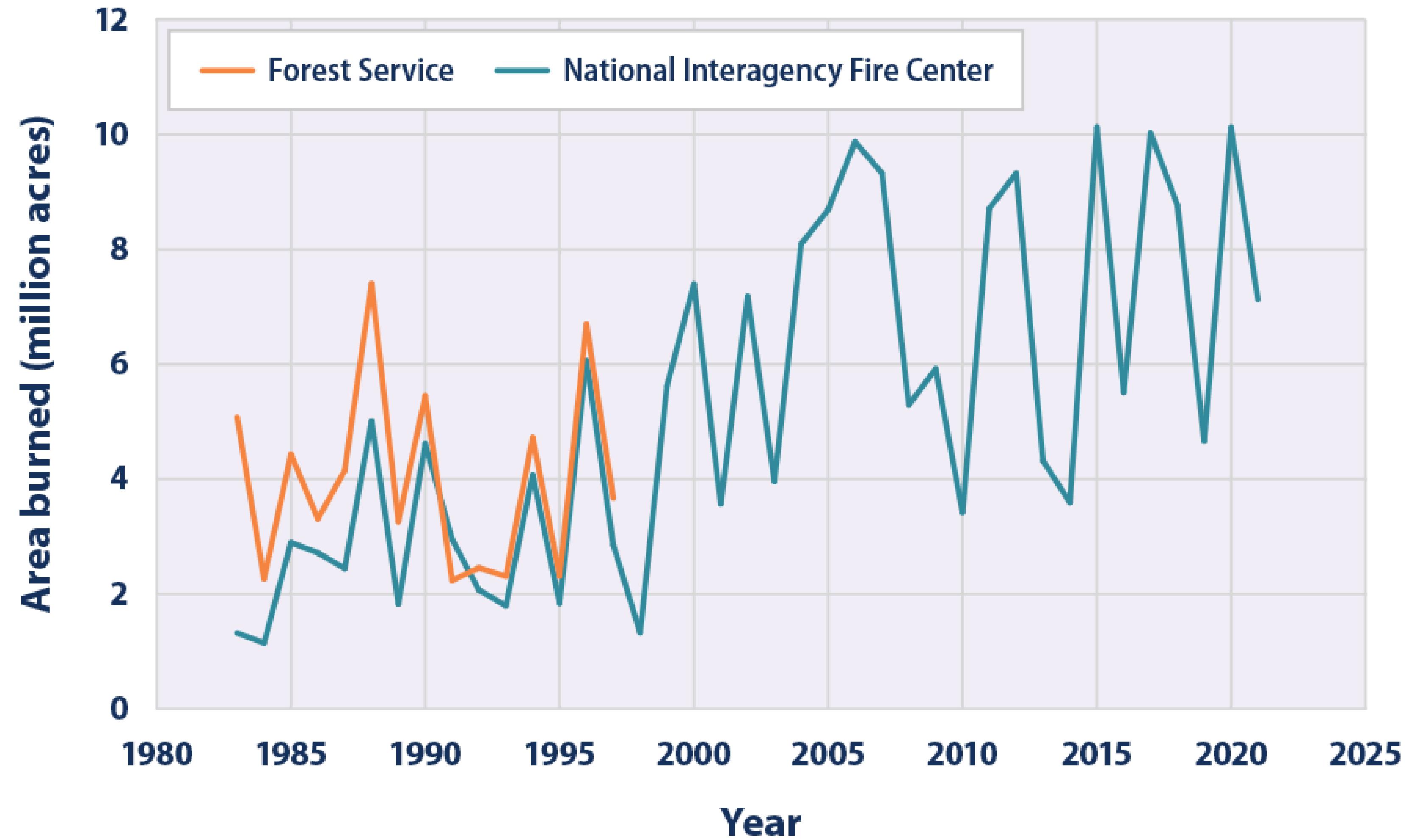
# WILDFIRE PREDICTION AND ANALYSIS



Hasan Ali ÖZKAN  
Mehmet Kadri GOFRALILAR  
Zeynep Filiz EREN

# INTRODUCTION





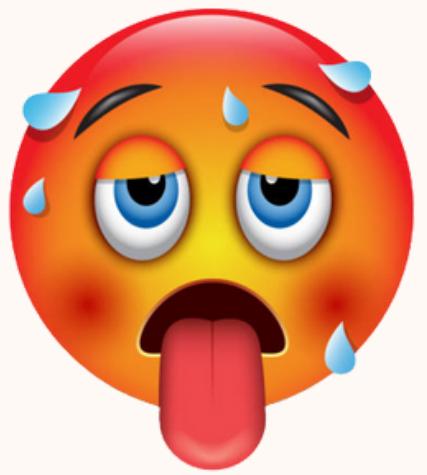


DATA





DATA



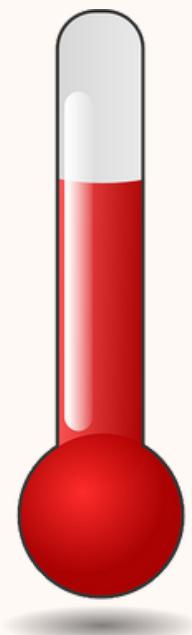
Temperature



# DATA



Temperature

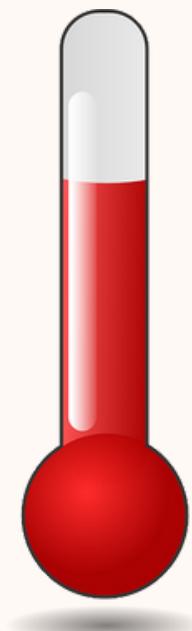


Heat Index

# DATA



Temperature



Heat Index

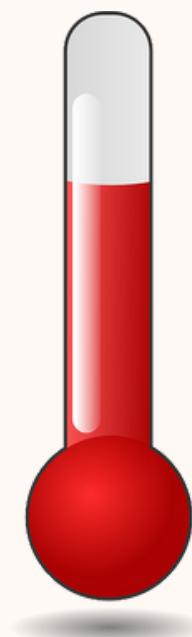
Humidity



# DATA



Temperature



Heat Index

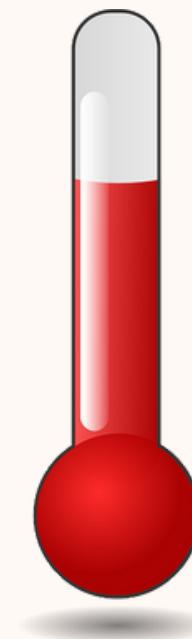
Humidity



Cloud Cover



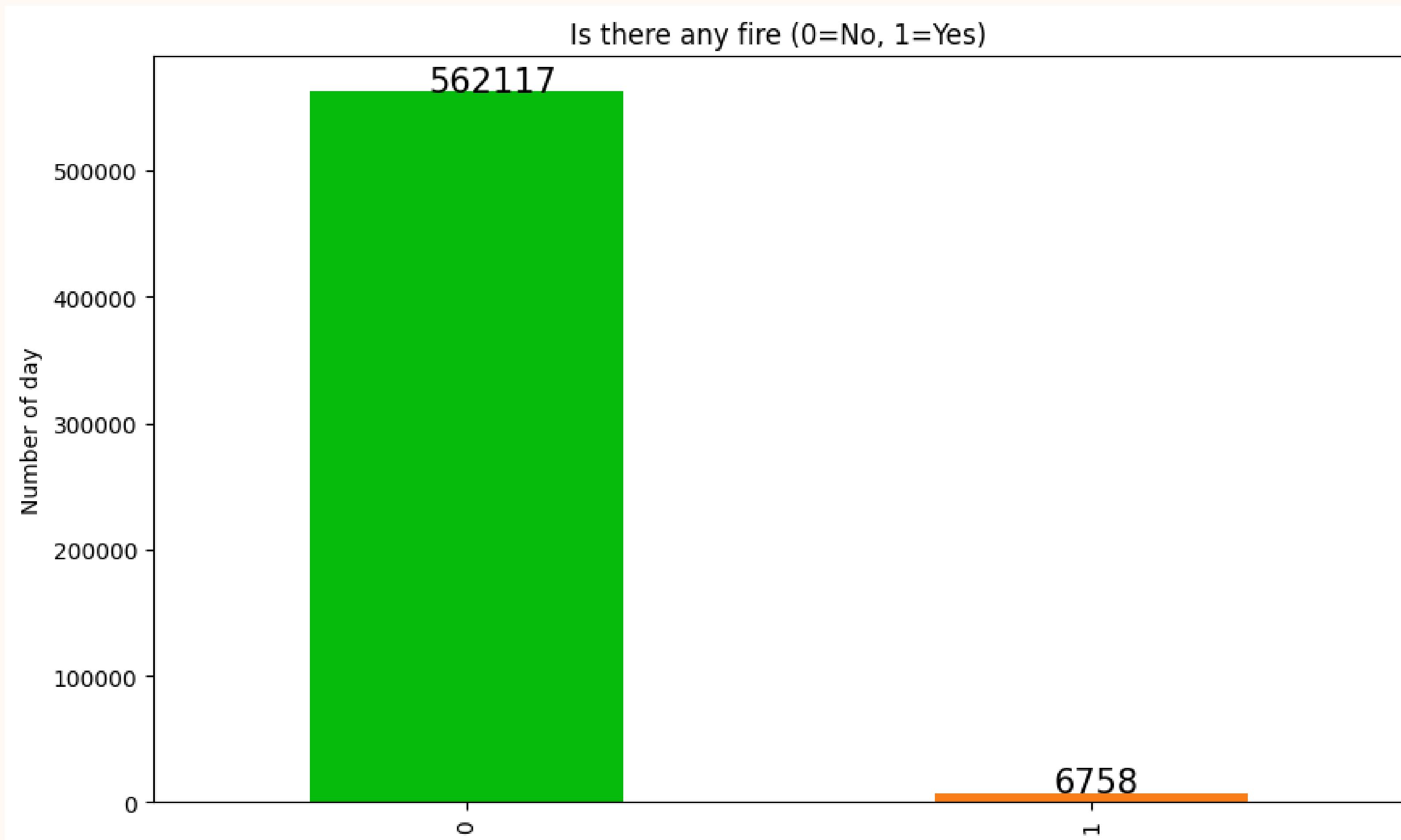
# DATA



# DATA

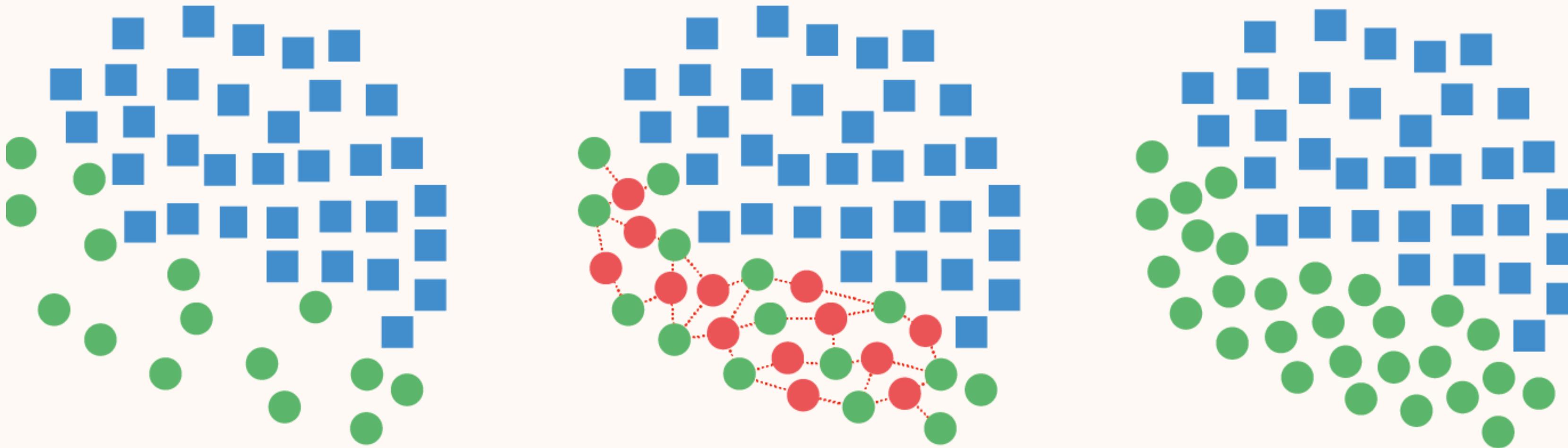
Name	Date time	Maximum Temperature	Heat Index	Cloud Cover	Relative Humidity	IsFire
Acıpayam, Denizli, Türkiye	4/1/2000	24.7	34.5	50.0	48.88	0
Acıpayam, Denizli, Türkiye	4/2/2000	25.9	33.7	30.0	47.99	0
Acıpayam, Denizli, Türkiye	4/3/2000	23.2	34.2	47.5	59.44	0
Acıpayam, Denizli, Türkiye	4/4/2000	25.2	36.0	58.8	52.1	0
Acıpayam, Denizli, Türkiye	4/5/2000	28.2	36.6	56.3	33.11	0
Acıpayam, Denizli, Türkiye	4/6/2000	21.7	38.0	18.8	52.19	0
Acıpayam, Denizli, Türkiye	4/7/2000	19.7	36.0	36.3	62.55	0
Acıpayam, Denizli, Türkiye	4/8/2000	12.4	39.3	78.8	78.64	0
Acıpayam, Denizli, Türkiye	4/9/2000	11.9	39.7	72.5	67.96	0
Acıpayam, Denizli, Türkiye	4/10/2000	15.4	40.0	58.8	55.2	0
Acıpayam, Denizli, Türkiye	4/11/2000	21.7	39.0	42.5	53.97	0
Acıpayam, Denizli, Türkiye	4/12/2000	23.9	35.5	61.3	55.67	0
Acıpayam, Denizli, Türkiye	4/13/2000	16.7	35.5	75.0	79.73	0
Acıpayam, Denizli, Türkiye	4/14/2000	22.7	39.6	0.0	64.23	0
Acıpayam, Denizli, Türkiye	4/15/2000	24.9	32.9	3.8	57.66	0

# METHOD



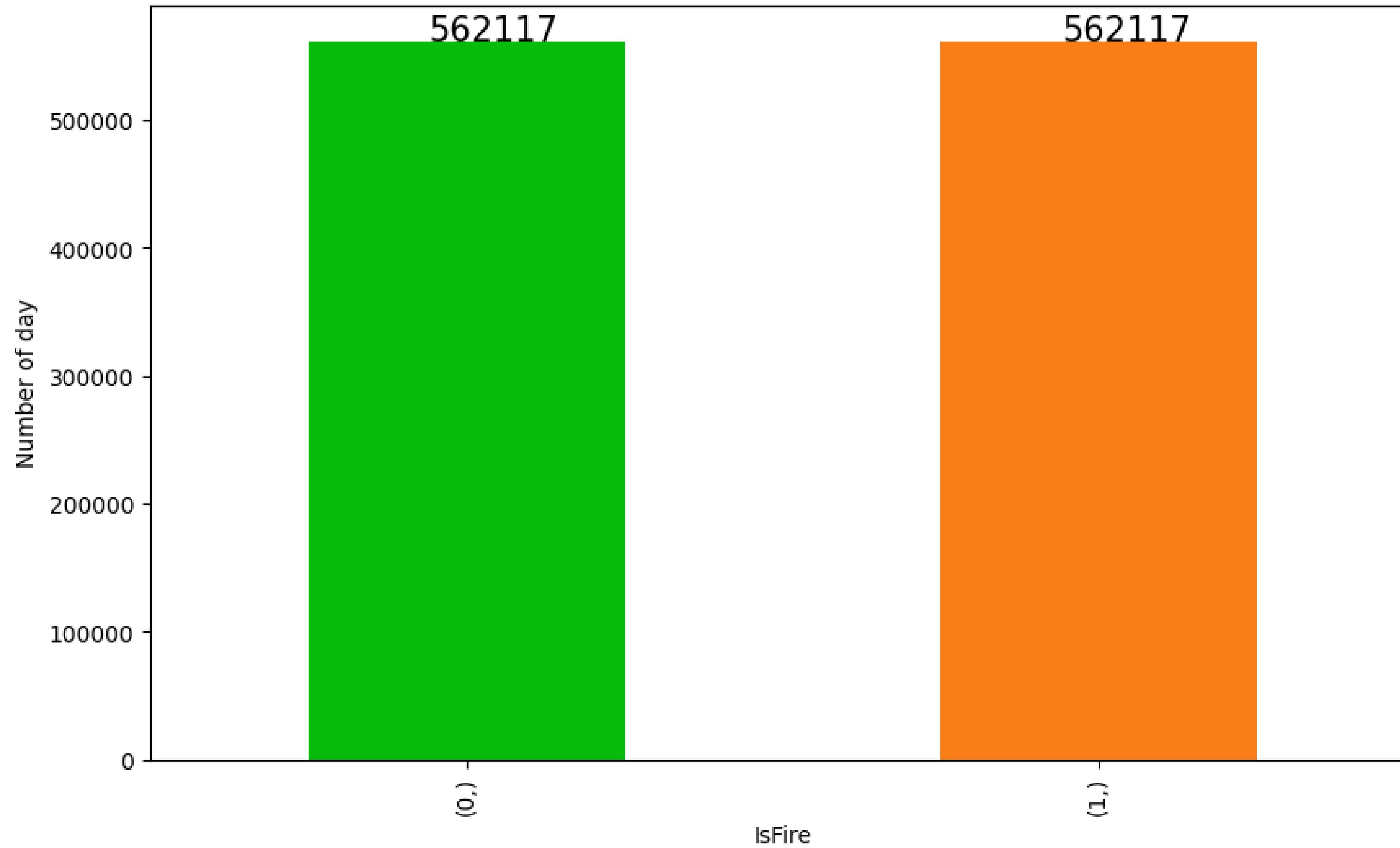
# METHOD

## Synthetic Minority Oversampling Technique

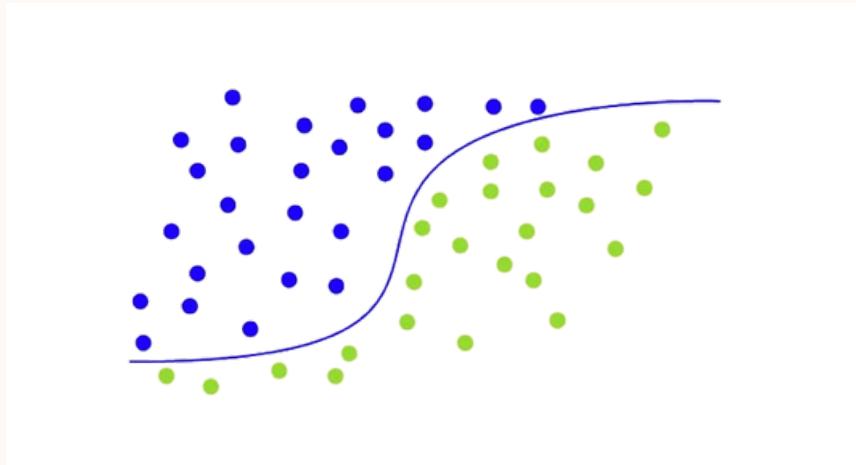


# METHOD

Is there any fire (0=No, 1=Yes)

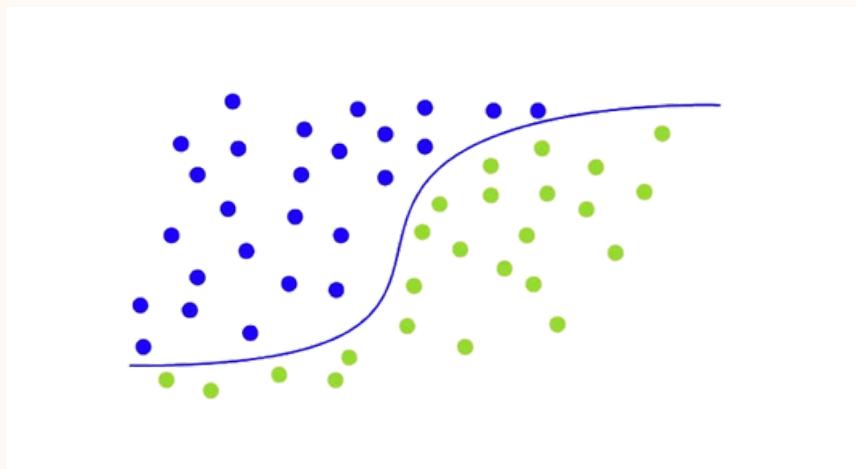


# METHOD

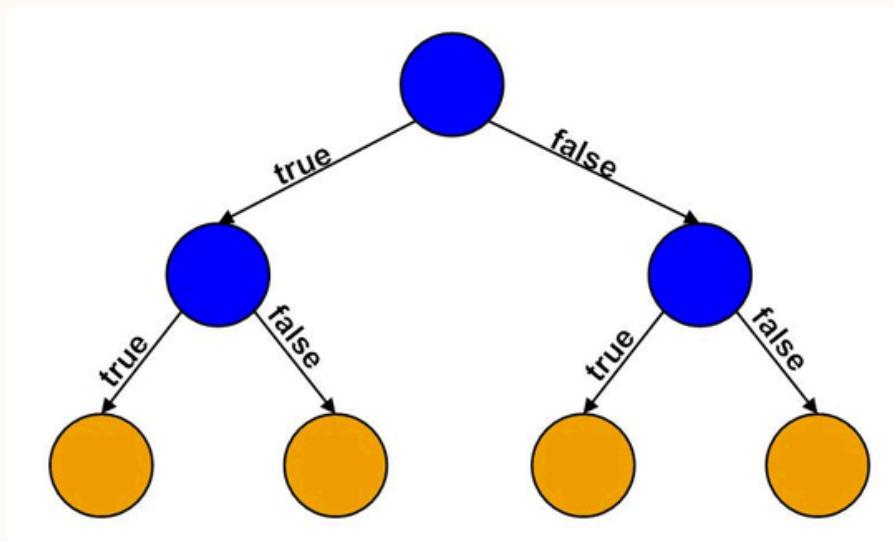


Logistic Regression

# METHOD

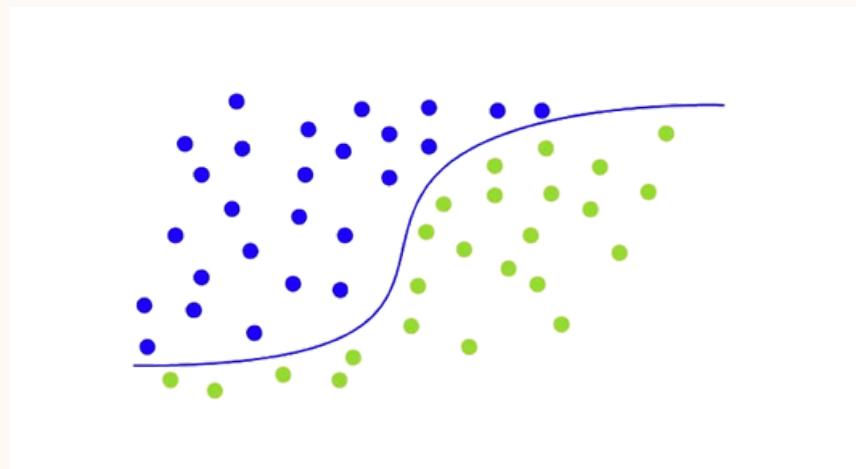


Logistic Regression

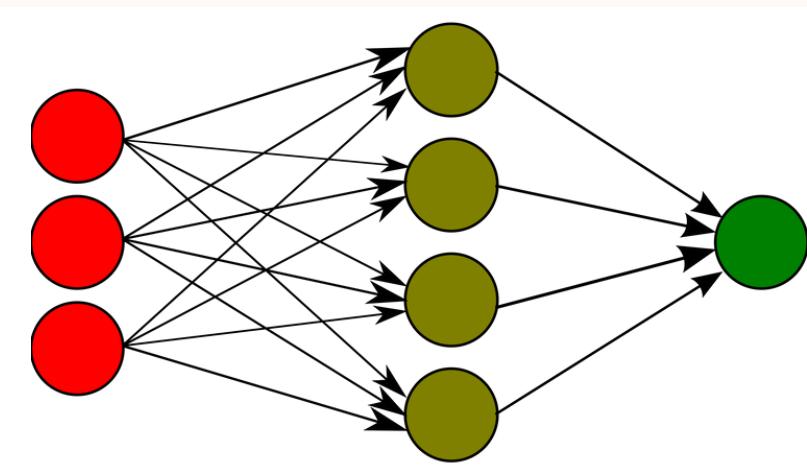


Decision Tree

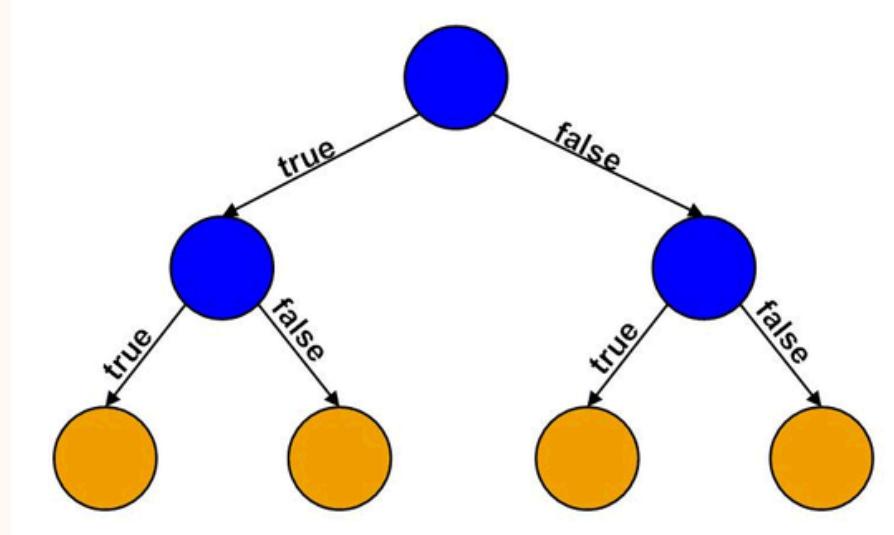
# METHOD



Logistic Regression

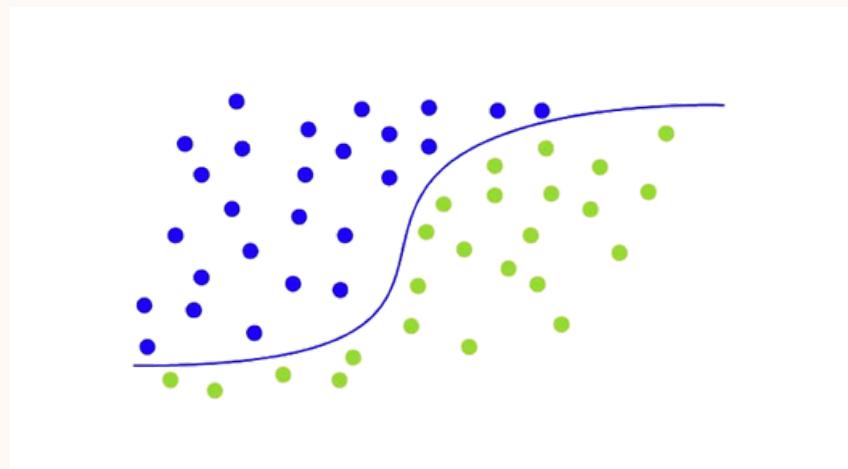


MLP

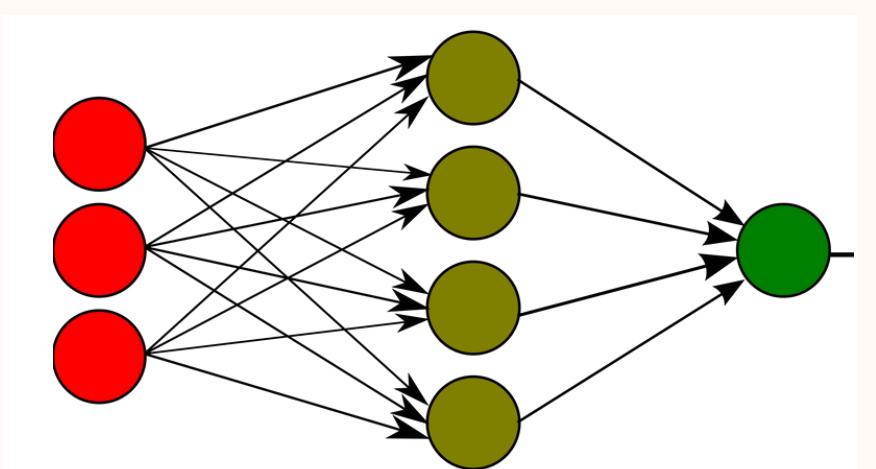


Decision Tree

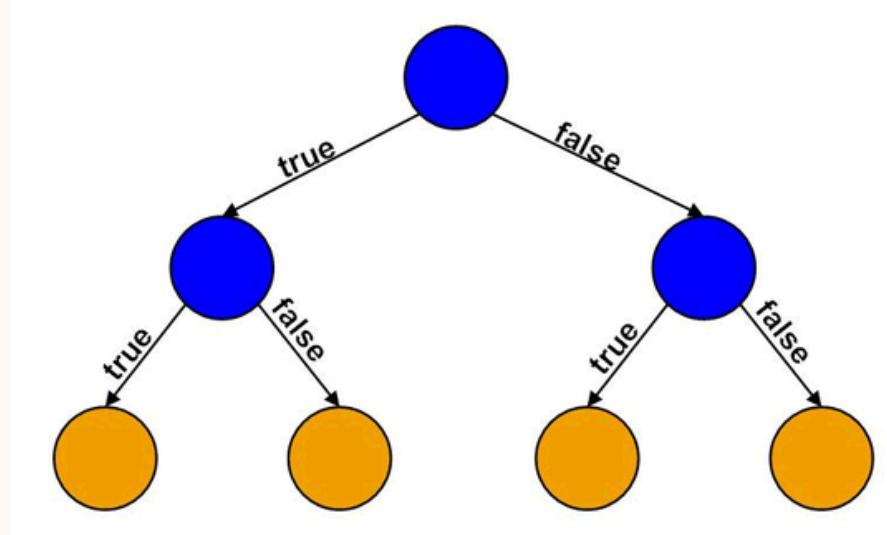
# METHOD



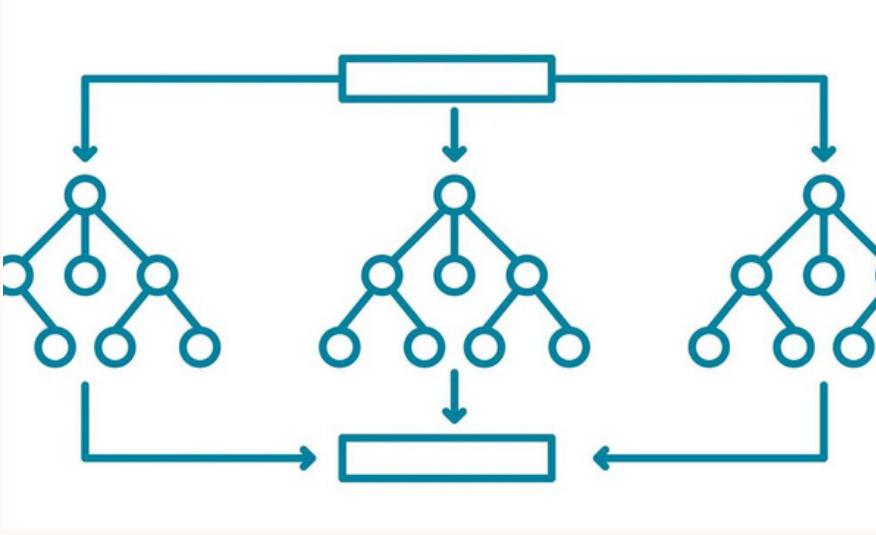
Logistic Regression



MLP

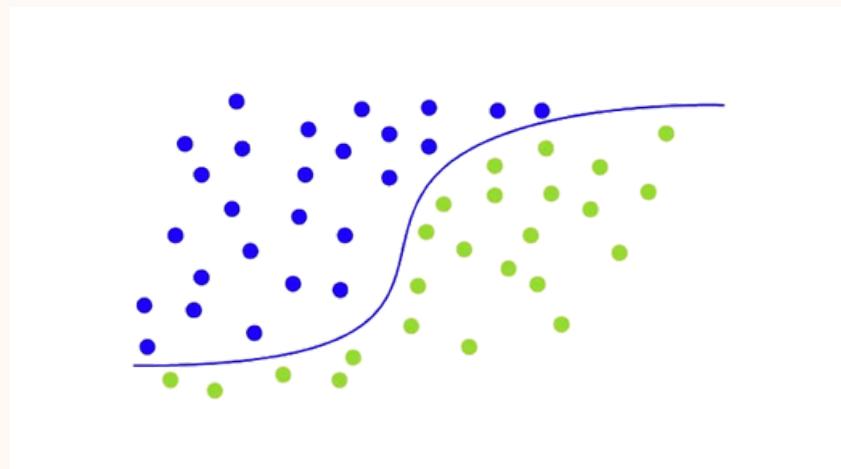


Decision Tree

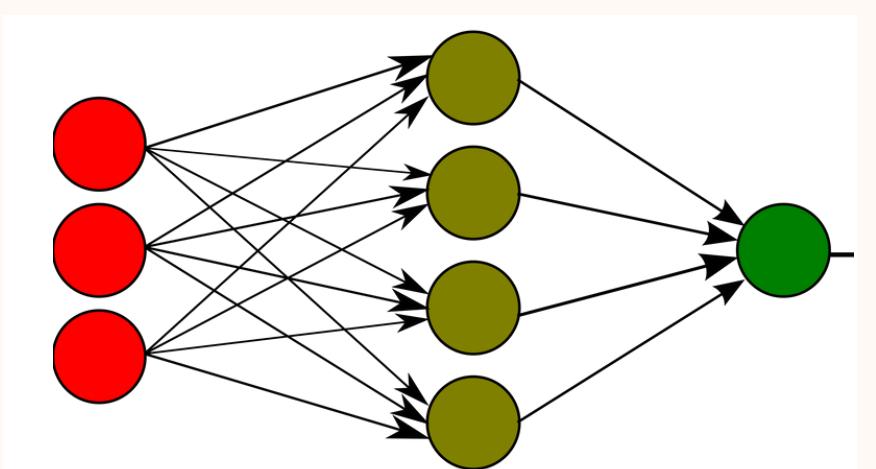


Random Forest

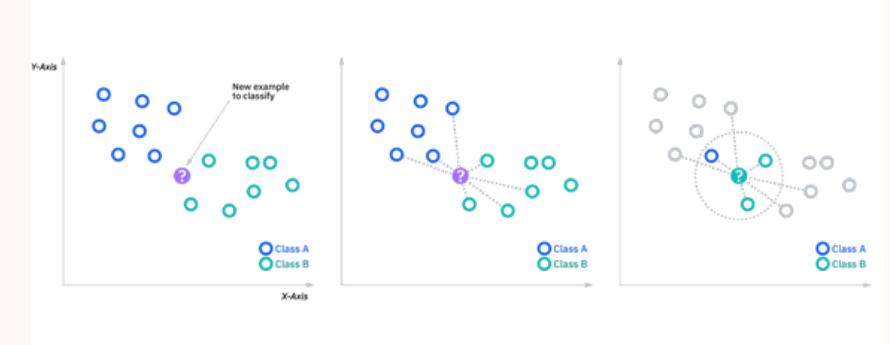
# METHOD



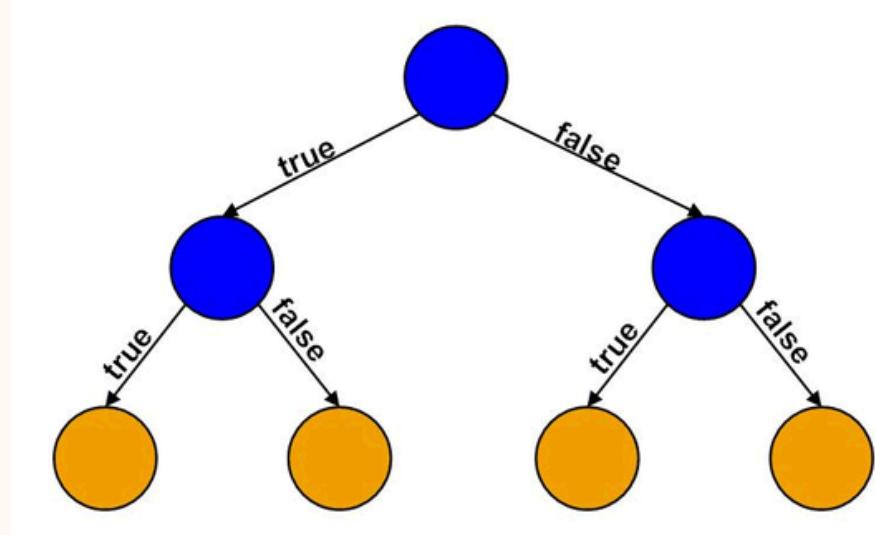
Logistic Regression



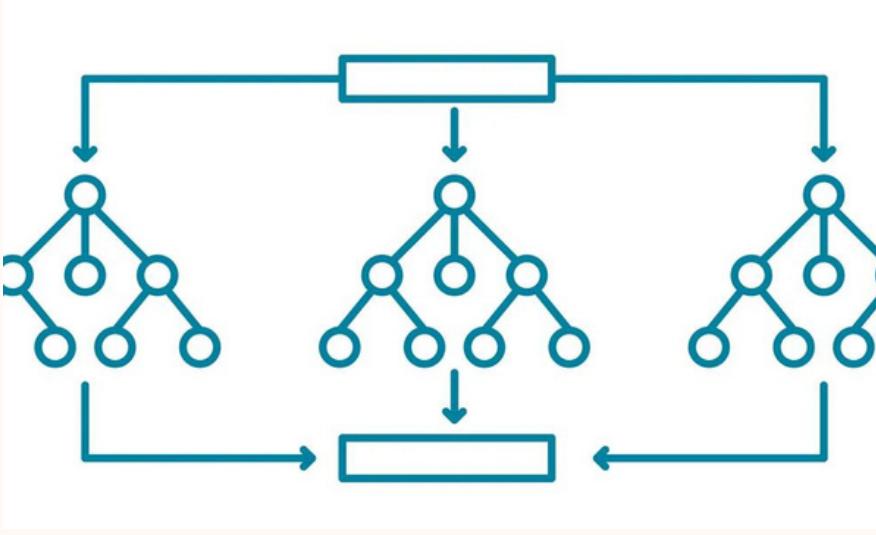
MLP



kNN

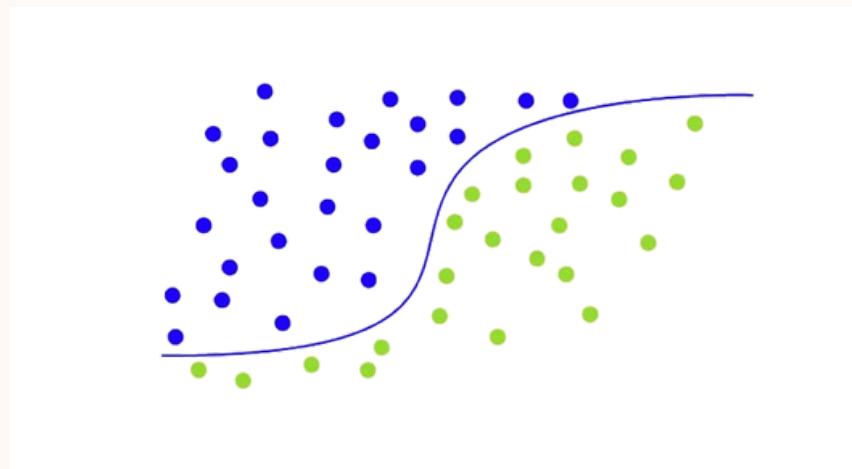


Decision Tree

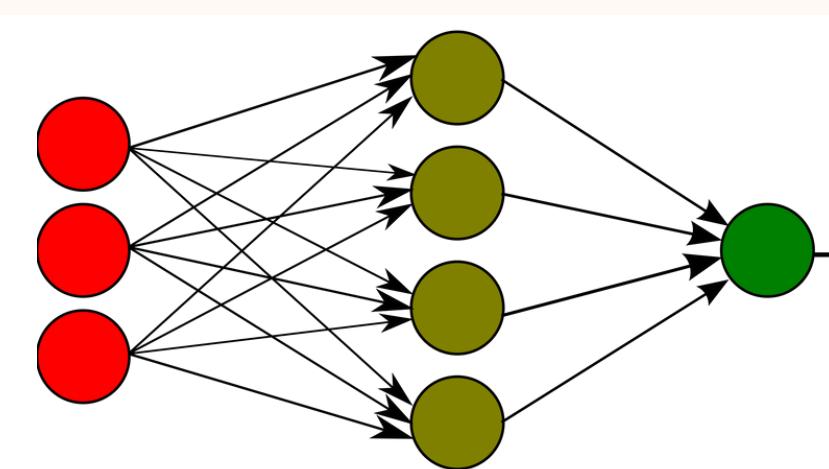


Random Forest

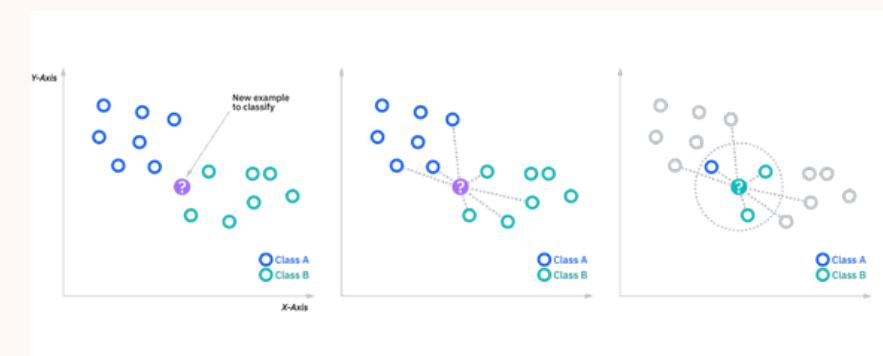
# METHOD



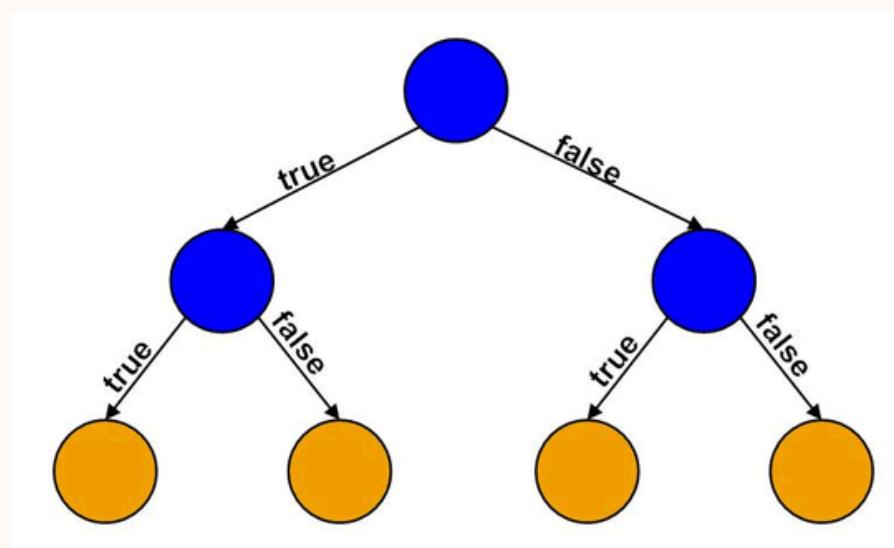
Logistic Regression



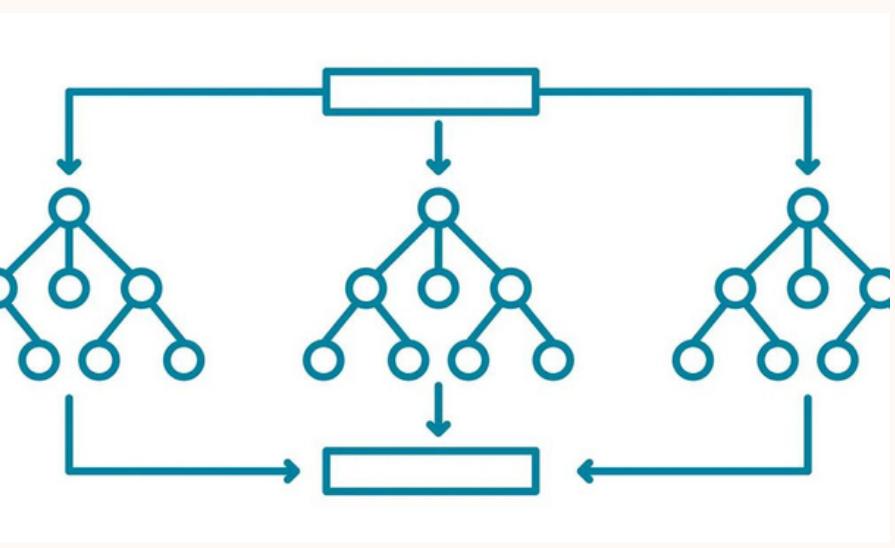
MLP



kNN



Decision Tree



Random Forest

$$P(A|B) = \frac{P(B|A) P(A)}{P(B)}$$

Naïve Bayes

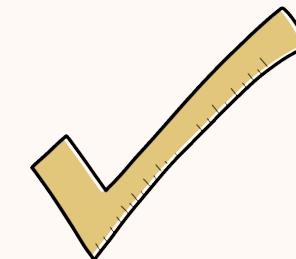
# EVALUATION

Metrics / Models	Logistic Regression	Decision Tree	Random Forest	Multi Layer Perceptron (Neural Network)	Naive Bayes	k Nearest Neighbours
Accuracy	0.6112	0.9583	0.7914	0.6497	0.5819	0.9316
Sensitivity	0.5703	0.9504	0.9903	0.6724	0.6773	0.9880
Precision	0.6209	0.9657	0.5883	0.5832	0.3124	0.8738
Specificity	0.6521	0.9662	0.7074	0.6323	0.5534	0.8869
Neg. Pred. Value	0.6030	0.9512	0.9942	0.7161	0.8512	0.9894
Time(second)	6.3 seconds	11.6 seconds	90.0 seconds	170.0 seconds	5.5 seconds	122.0 seconds

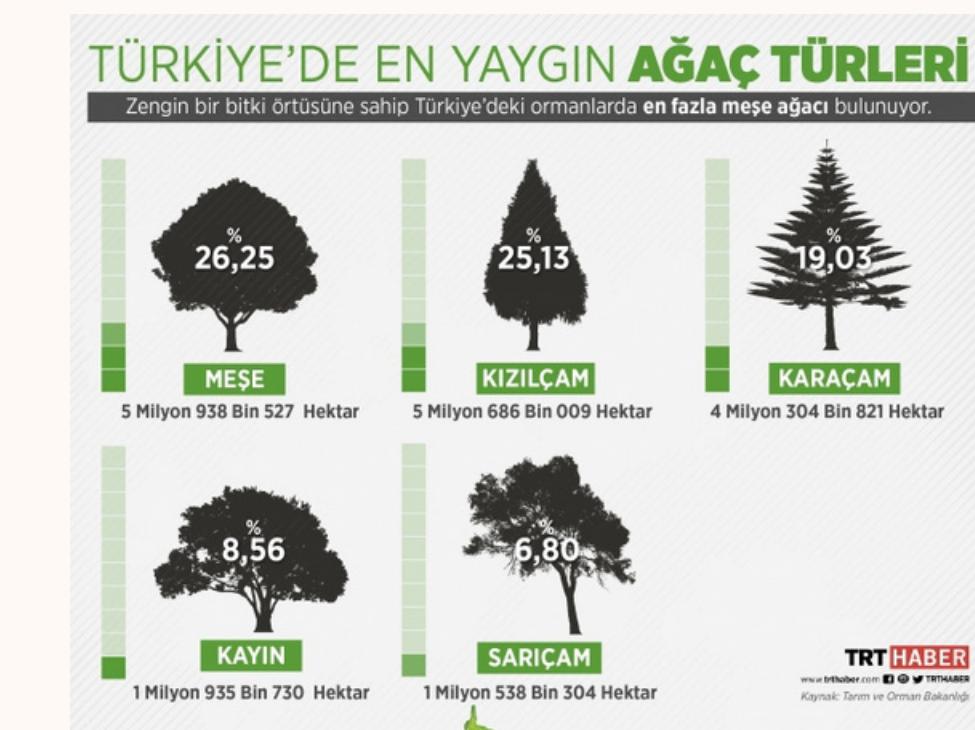
on MacBook Pro 2017 2.3 GHz Dual-Core Intel Core i5  
8 GB Ram Intel Iris Plus Graphics 640 1536 MB

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Forest Volume



Tree Species in Forests

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THANKS!&QUESTIONS?