Evaluation metrics:
and alarm are +ve. what is a false alarm?

* Classification: which category new instance belongs to. : e
example: is object is a hat or a car

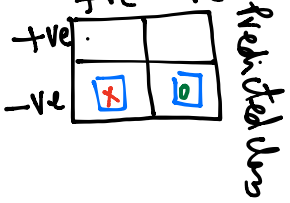
* Regression: here we want to make a prediction of continuous data.
eg: we have data on height, weight and gender and we want to predict weight. we are interpolating the results.

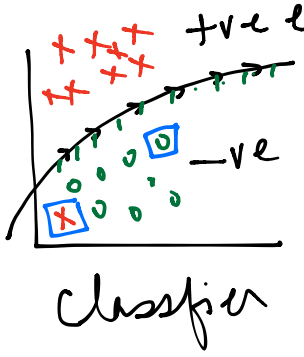
* accuracy: how accurately can the classification algorithm identify or label correctly.

* Accuracy is the default metric for .score() method for classifier in SKLEARN

* accuracy: $\frac{\text{no of items labeled correctly}}{\text{all items in that class}}$

* confusion matrix: it is a 2x2 matrix





The green point in the box got predicted to lie on the green side of the predicted line

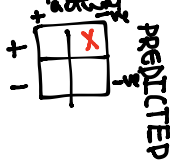
predicted line =

Hence it is a -ve -ve result/bucket

* The red X point [X] got predicted on the -ve side. hence it is in the +ve -ve bucket

The pt was truely +ve predicted -ve.

* Example : suppose we have a burglar alarm systems. And burglar on



* you can shift the curve to tweak the accuracy.

* Recall : probablity of algorithm to correctly identify the object given the object is present

* Precision: rate of prediction of algorithm to identify the object. here the algorithm observes the object in the matrix and what is the rate it correctly identifies it?

$$\text{precision} = \frac{\text{True +ve}}{\text{True +ve + False +ve}}$$

$$\text{recall} = \frac{\text{True +ve}}{\text{True +ve + False -ve}}$$

* Recall: is incorrectly identifying an object, it a probability rate. it is a False -ve when it is really the actual object
* Precision: is the probability of incorrectly identifying the object a being there when its not really there. it is a False +ve rate

* F1 Score: is the weighted averge of recall and precision

$$F1 = \frac{2 * (\text{Recall} * \text{Precision})}{(\text{Recall} + \text{Precision})}$$

* Regression :⟹ we expect the prediction to achieve a close results here

* mean Absolute Error: it is the predicted distance from the true value.

$$\text{mean Absolute error} = \frac{\sum \text{Absolute errors of each pt}}{\#\text{ of pts}}$$

* mean squared error: most commonly used for model validation

It make the residual error true values.

It emphasizes larger errors over smaller ones.

Being differentiable allows us to use calculus to find min & max values.

Increasing efficiency.

* R_2