

## Heart rate failure classification

i) pre-process data (find outliers with box-plot)

$$iqr = (75\% \text{ quartile}) - (25\% \text{ quartile})$$

$$uw = q_3 + 1.5 * iqr$$

$$lw = q_1 + 1.5 * iqr$$

ii) how fixing outliers

make value above  $uw = uw$

values below  $lw = lw$

ii) normalize data (max-min)

$$df['data'] = (df['data'] - \text{min\_value}) / (\text{max\_value} - \text{min\_value})$$



Use if columns have large values

2) ML model

→ oversampling is used to make sure the target data points are balanced.

(This generates new data-points)



$X_{train}, X_{test}, Y_{train}, Y_{test}$

$= \text{test\_train\_split}(X, Y,$   
 $\text{random\_state} = 4, \checkmark$  90 10% of  
 $\text{stratify} = Y, \text{test\_size} = 0.1)$   
of data

↑  
makes sure equal category of  
target data is taken  
(No new data points generated)

3) Algorithm (KNN (Nearest neighbours))

checks distance of (example 10) nearest  
point

(finds avg of each category and takes  
which has minimum one)

$\text{knn\_model} = \text{KNeighborsClassifier}$   
( $n\_neighbours = 10$ )

4) Confusion matrix

I died →	339	5	I am not even alive
I died → but I survived	4	379	Dead