ANA ANDRÉ, DATA SQUAD #21

ROOM OCCUPANCY DETECTION

SUPERVISED MACHINE LEARNING

2019.09.30

MOTIVATION

SMART BUILDING: ENERGY EFFICIENCY

30 to 40%

ENERGY SAVINGS

GREEN BUILDINGS

ENERGY SAVINGS

WORKFLOW

COLECT DATA

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EXPLORE DATA

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TRAINING AND TESTING

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EVALUATION

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RESULTS

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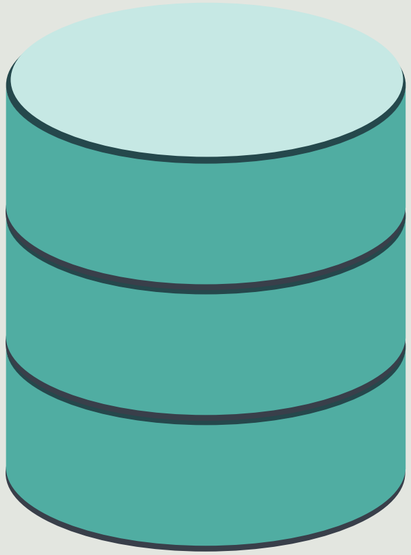
DATASET

OCCUPANCY DETECTION DATA SET

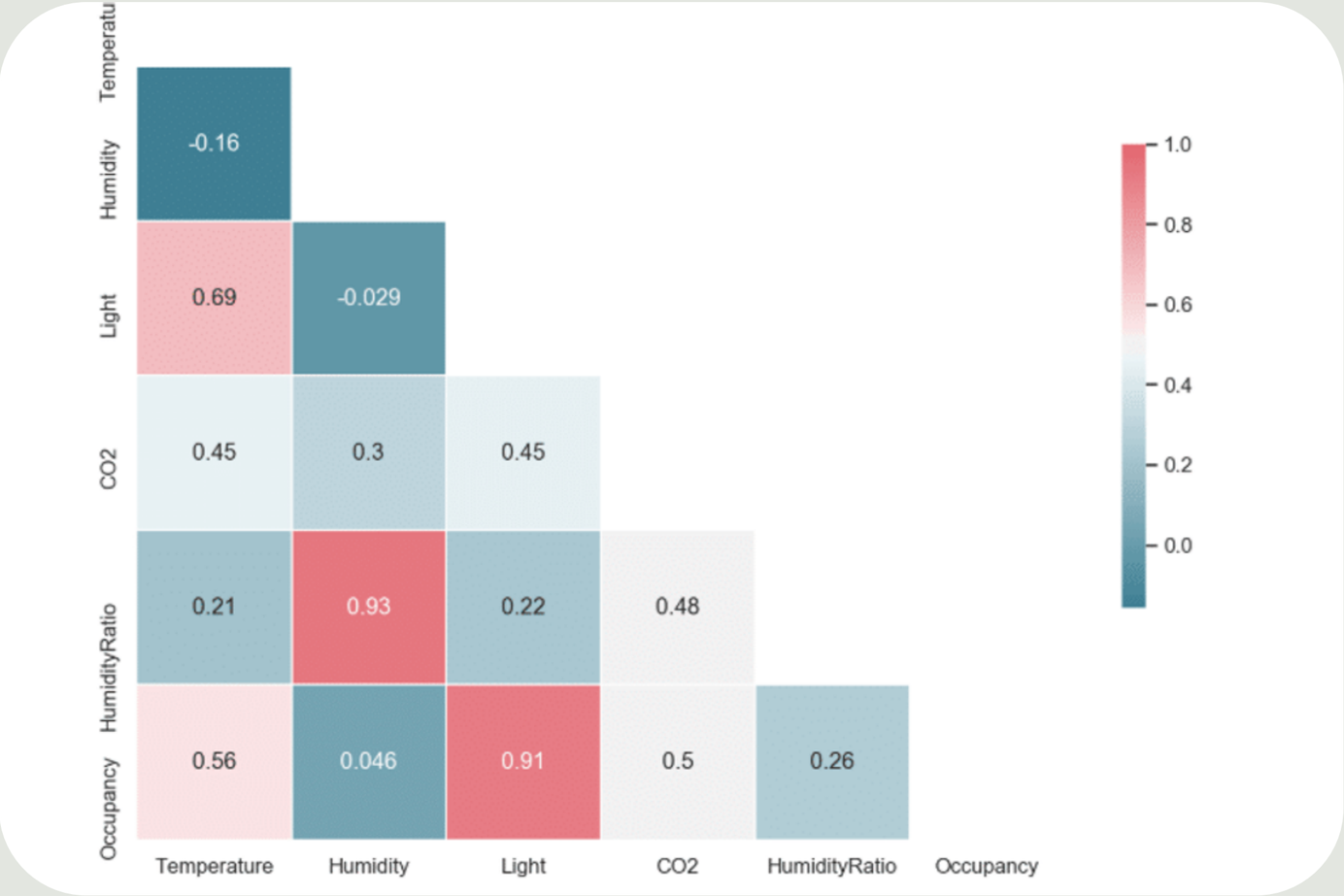


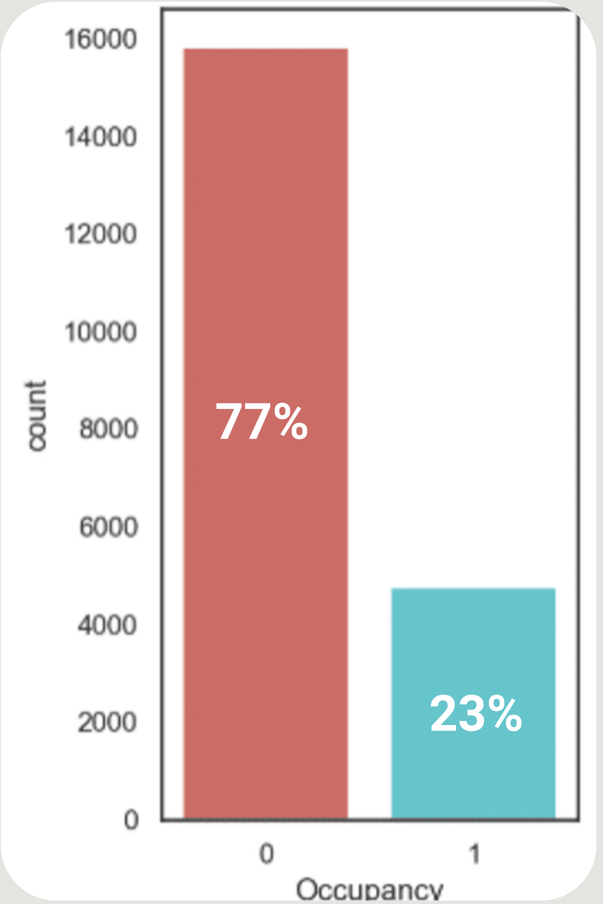
UCI Machine Learning Repository

4 environmental features
20 560 instances
Classification purposes

Is the room occupied or nor?

EXPLORE THE DATASET





CLASSIFICATION MODELS

LOGISTIC REGRESSION (LR)

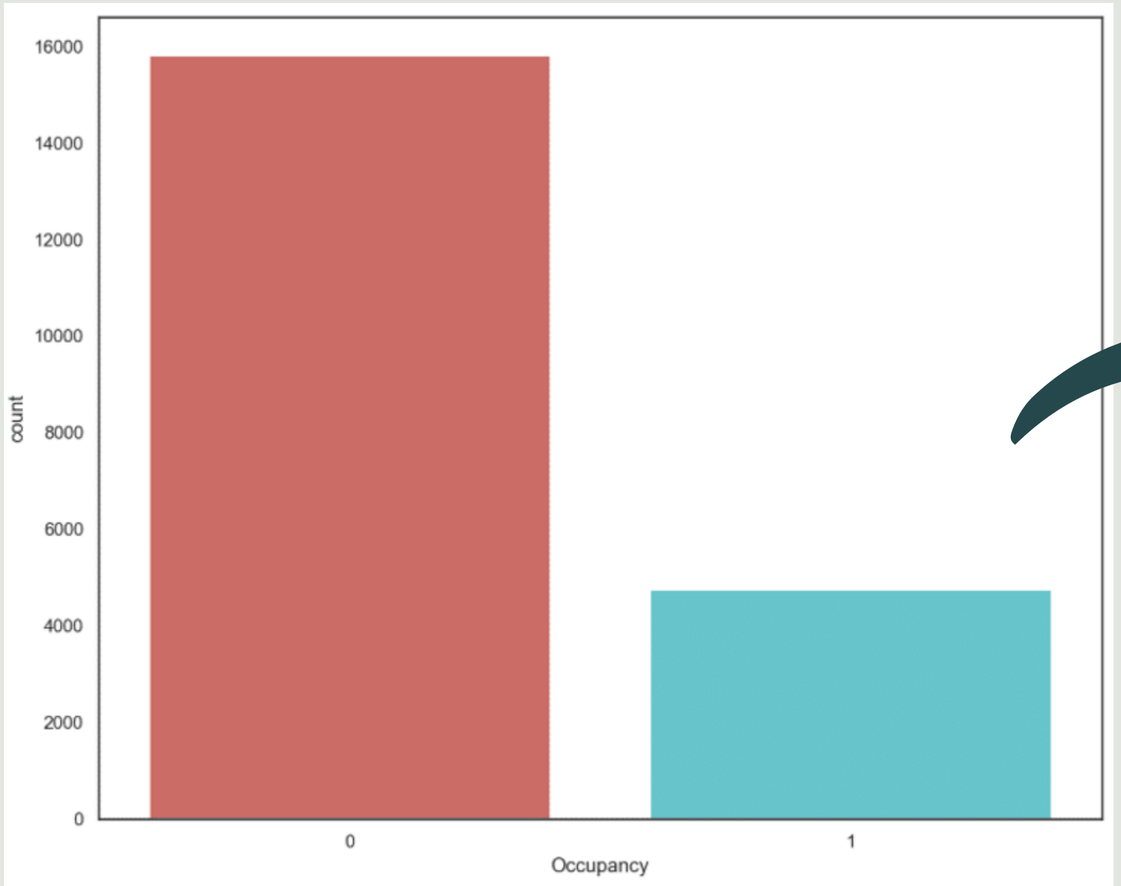
DECISION TREE (DTC)

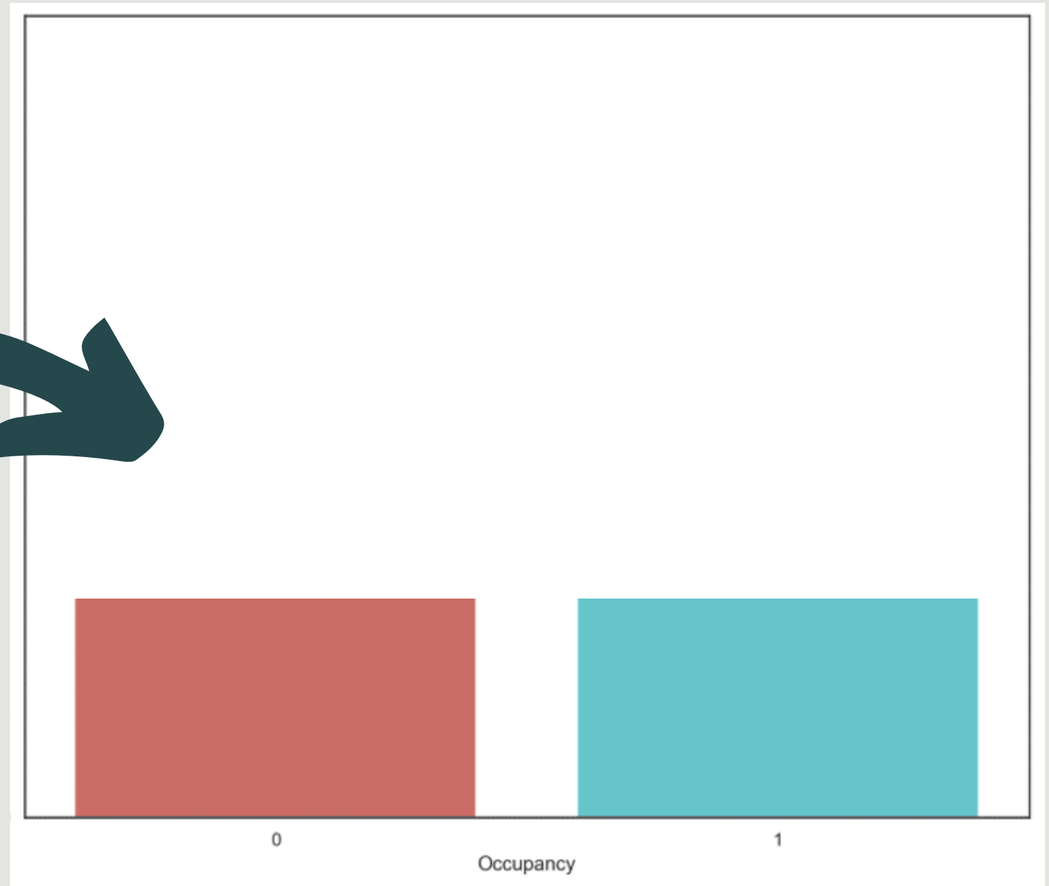
SUPPORT VECTOR MACHINE (SVM)

K-NEAREST NEIGHBOUR (KNN)

RESAMPLE DATA

IMBALANCED DATA | BALANCED DATA





MODELS PERFORMANCE

ACCURACY SCORE

Imbalanced

Balanced

H. Perform.

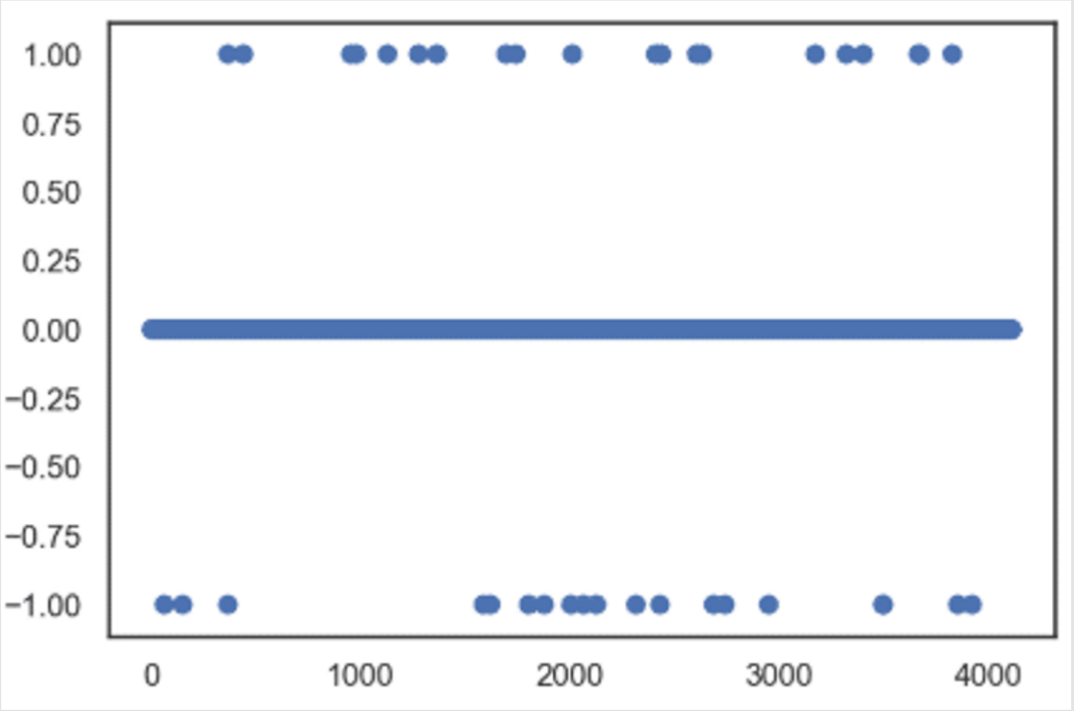
LR	98.93%	98.83%
DTC	99.05%	99.15%
SVM	95.45%	87.86%
KNN	98.32%	98.74%

MODEL EVALUATION

DECISION TREE | BALANCED DATA

CONFUSION MATRIX

TN **3085**	**FP** **28**
FN **7**	**TP** **992**



RECURSIVE FEATURE ELIMINATION

WHICH FEATURES ARE MORE IMPORTANT?

Temperature	Humidity	Light	CO2	Hum. Ratio
2	3	1	1	4

Accuracy score = 99%

THANK YOU

ANY QUESTIONS?