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Coding Dojo: April 2023

Class Presentation

Overview:

Data Source

-National Health and Nutrition Examination Survey

-The target is Metabolic Syndrome

-Each row represents a patient

-This is a classification problem

Business Problem

-To predict Metabolic Syndrome based on common risk factors.

Stakeholders

-Patients. Patients make decisions in consultation with their doctors.

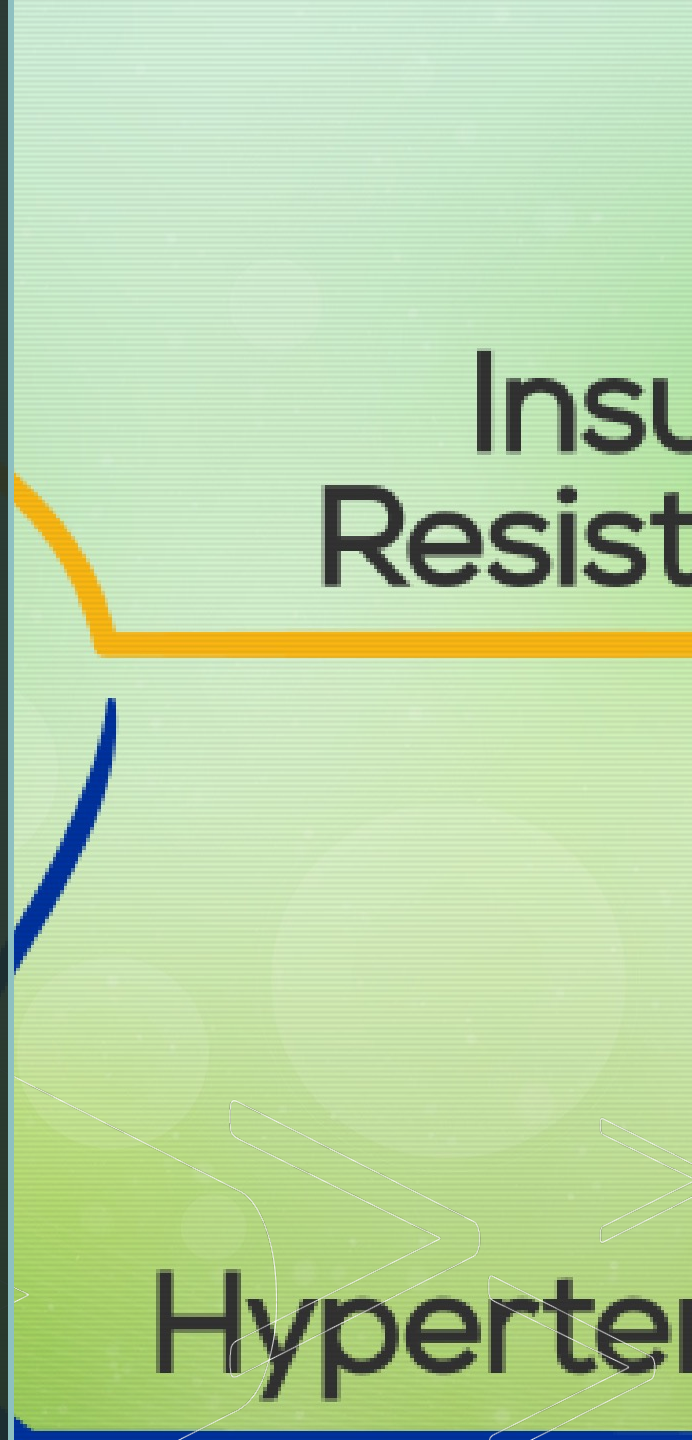
-Doctors & Medical Groups.

-Insurance Companies (Payors)

-Regulatory Bodies.

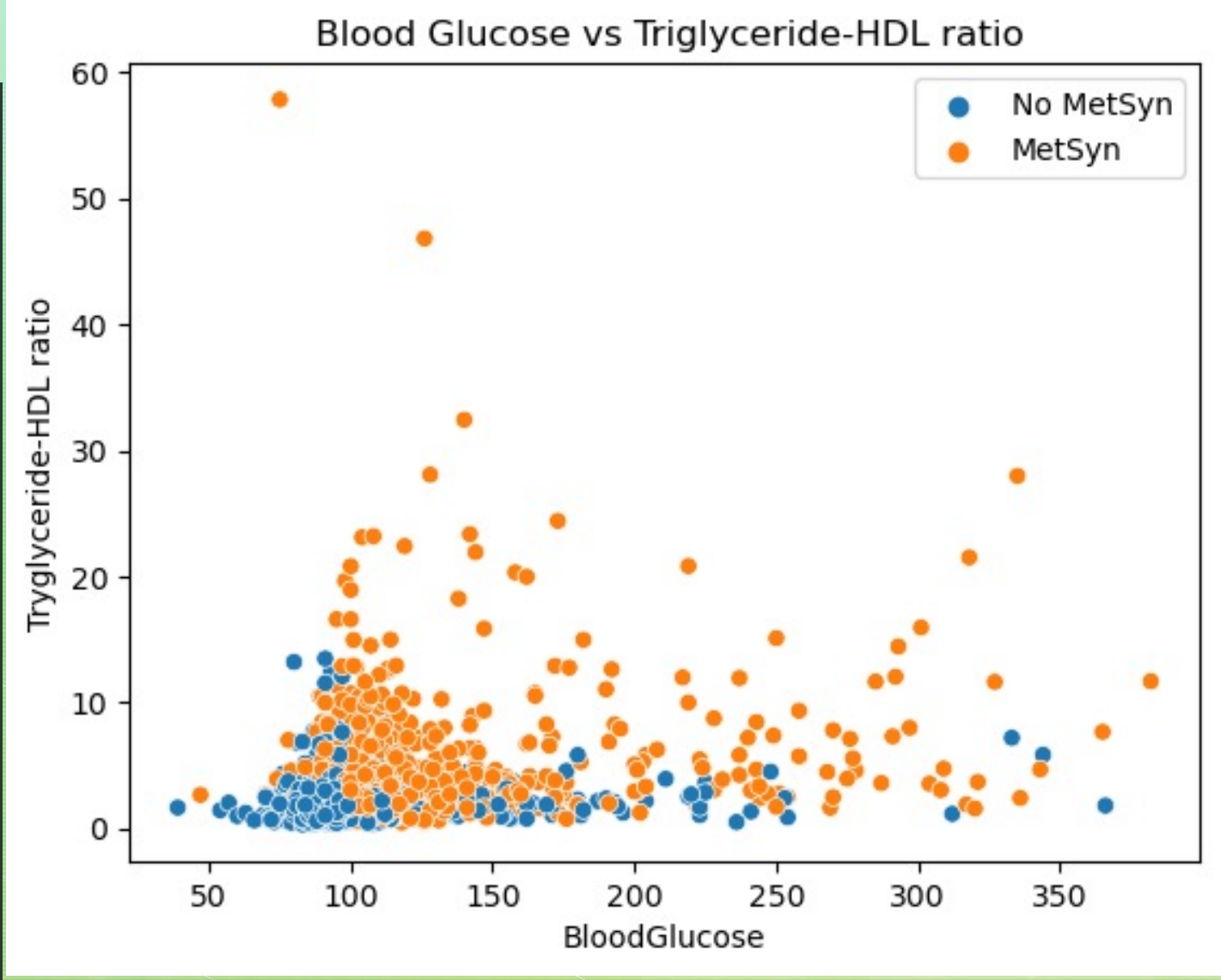
What is Metabolic Syndrome?

- Obesity
- Insulin Resistance (prediabetic/diabetic)
- Hypertension (high blood pressure)
- High Triglycerides (fat in blood)
- Low HDL Cholesterol (good cholesterol that flushes out the bad cholesterol in body)



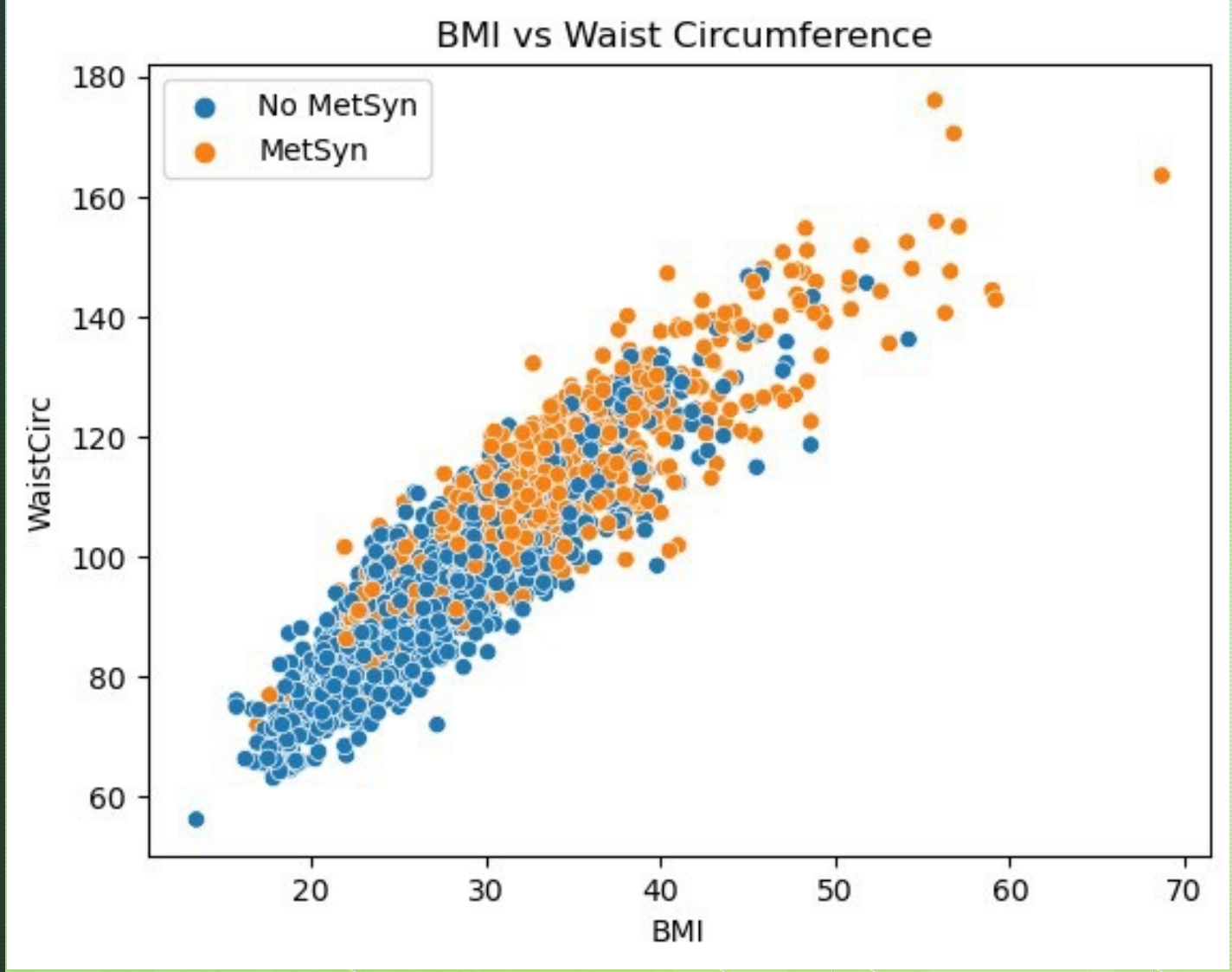
Relationship between Blood Glucose vs Triglyceride-HDL ratio

- positive relationship between patients who have metabolic syndrome and high blood glucose tended to have heart conditions by having higher Triglyceride-HDL ratios. Ideally a ratio of 2 or lower is healthy.

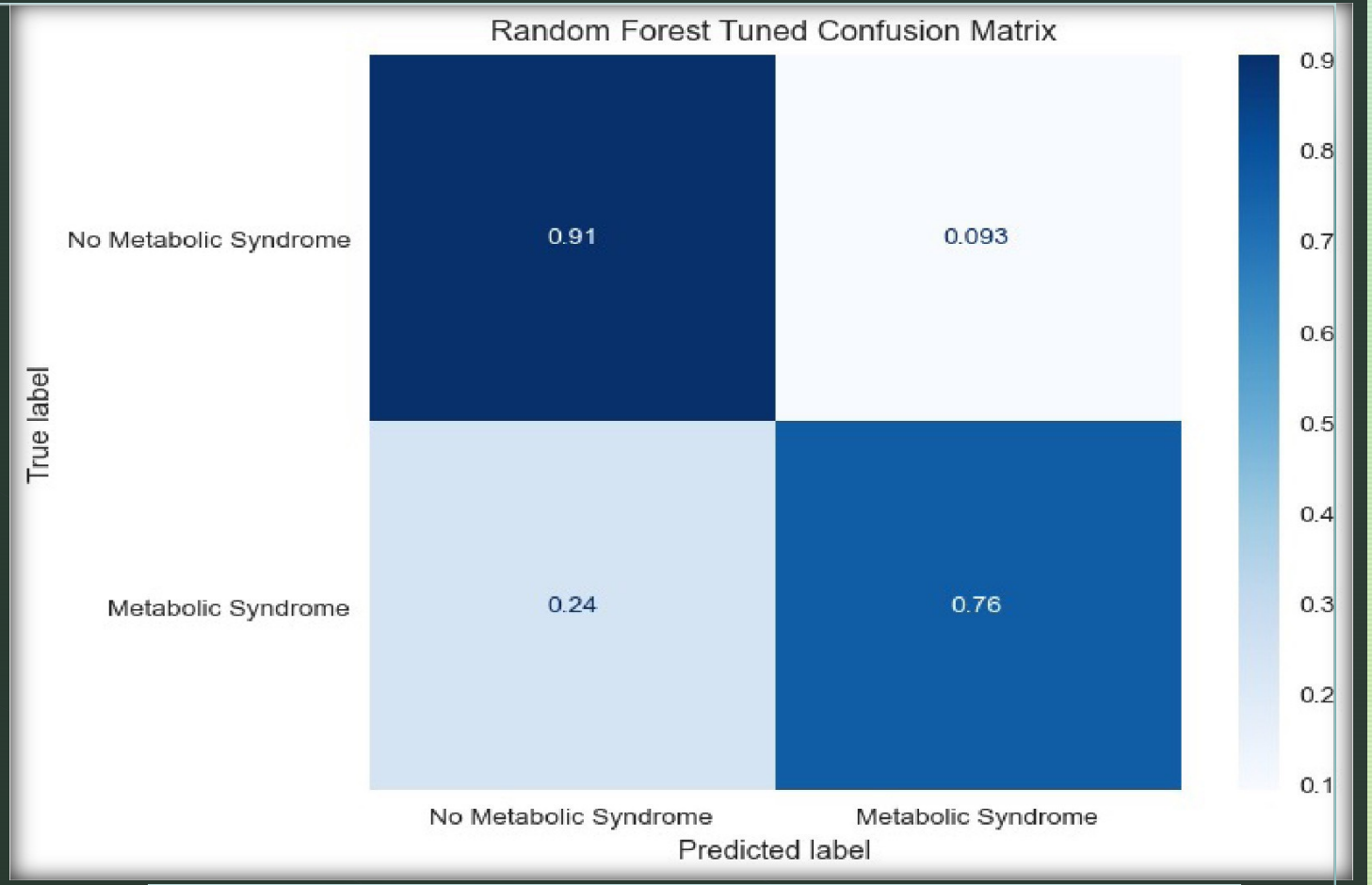


Relationship of BMI vs Waist Circumference

- positive relationship between patients who have metabolic Syndrome and high BMI and Waist circumference.



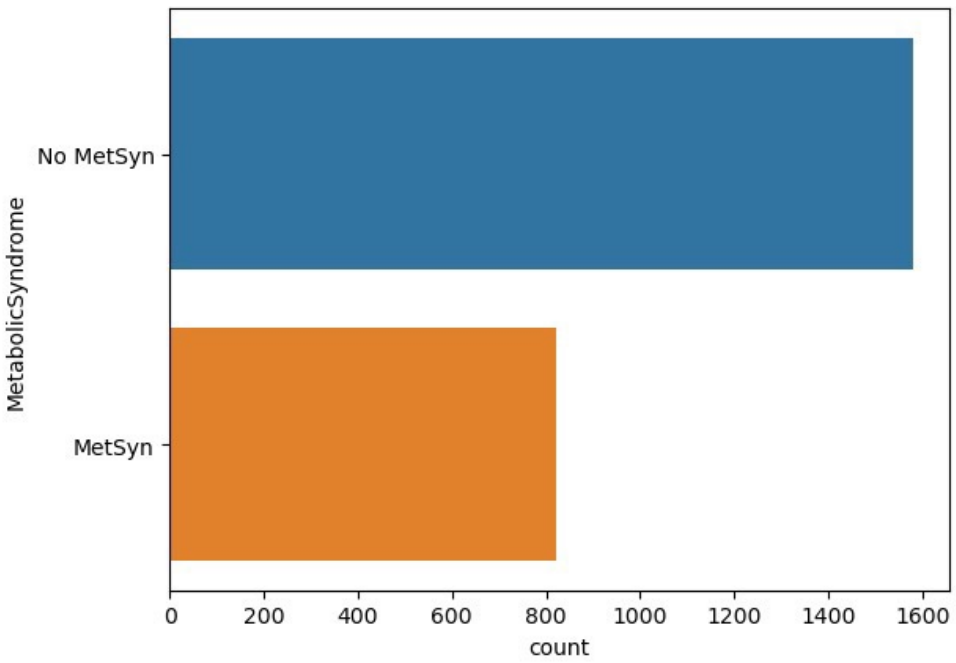
Machine Learning Prediction Model: Random Forest



	precision	recall	f1-score	support
0	0.88	0.91	0.89	397
1	0.81	0.76	0.79	204
accuracy			0.86	601

Class Imbalance:

- One class roughly double of the other class.



Final recommendations

- Based on the 2 scatterplots from earlier above :
  positive correlation between BMI, Triglyceride-HDL ratio and Blood Glucose
- All these features are an indicator of obesity. Two recommendations below
- Weight loss
- Diet and lifestyle changes

References

https://www.cdc.gov/nchs/nhanes/index.htm

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2664115/

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5565752/