



MINI PROJECT IV

# LOAN STATUS

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Robyn Mundle

# Machine Learning Structure

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## Issues to Tackle

- Data Preparation
- Feature Engineering
- Supervised Learning
- Pipelines
- Model Persistence
- Flask - Building Own API
- Deployment to Cloud (AWS)

“

**THE ONLY PEOPLE THAT A  
BANK WILL LOAN MONEY  
TO IS THE VERY PEOPLE  
WHO DON'T NEED IT**

**MARK TWAIN**

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# FACTORS AFFECTING APPROVAL

- **Credit History**

A past with money  
to have a future with money?

- **Income**

Higher Applicant and  
Co-Applicant money?

- **Education Level**

Higher levels = higher prospects?

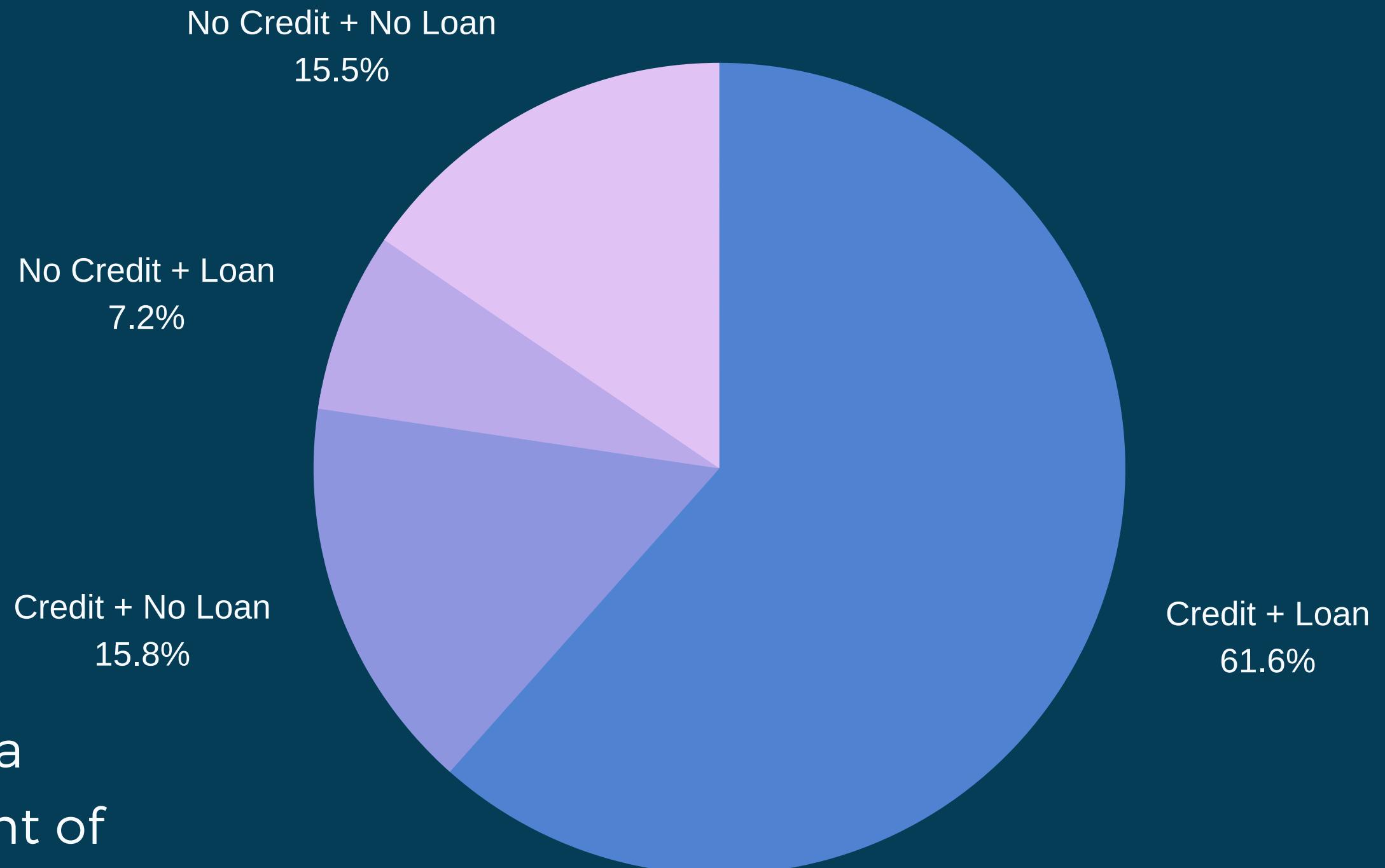
- **Property Area**

Higher growth perspective in  
urban areas?

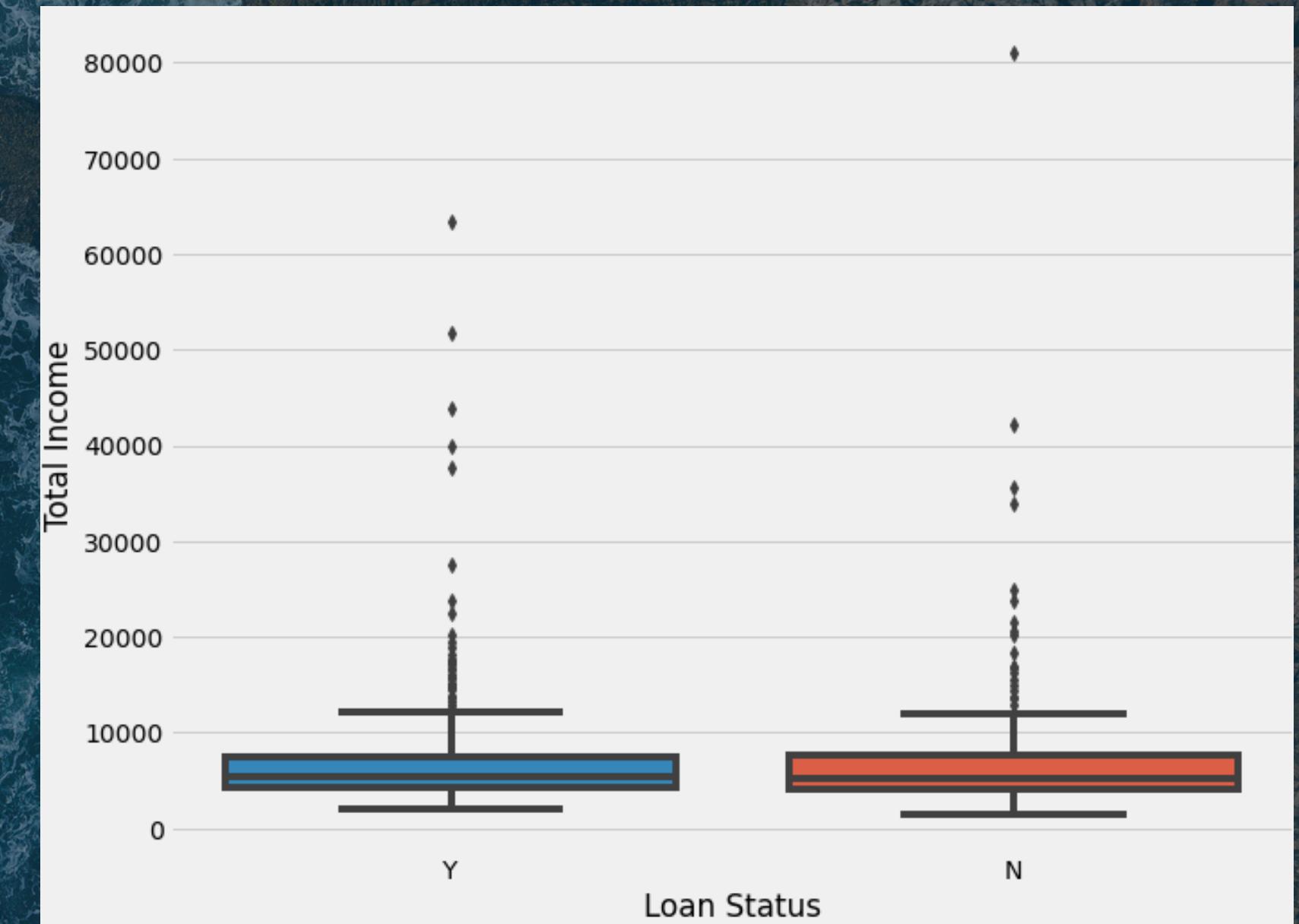
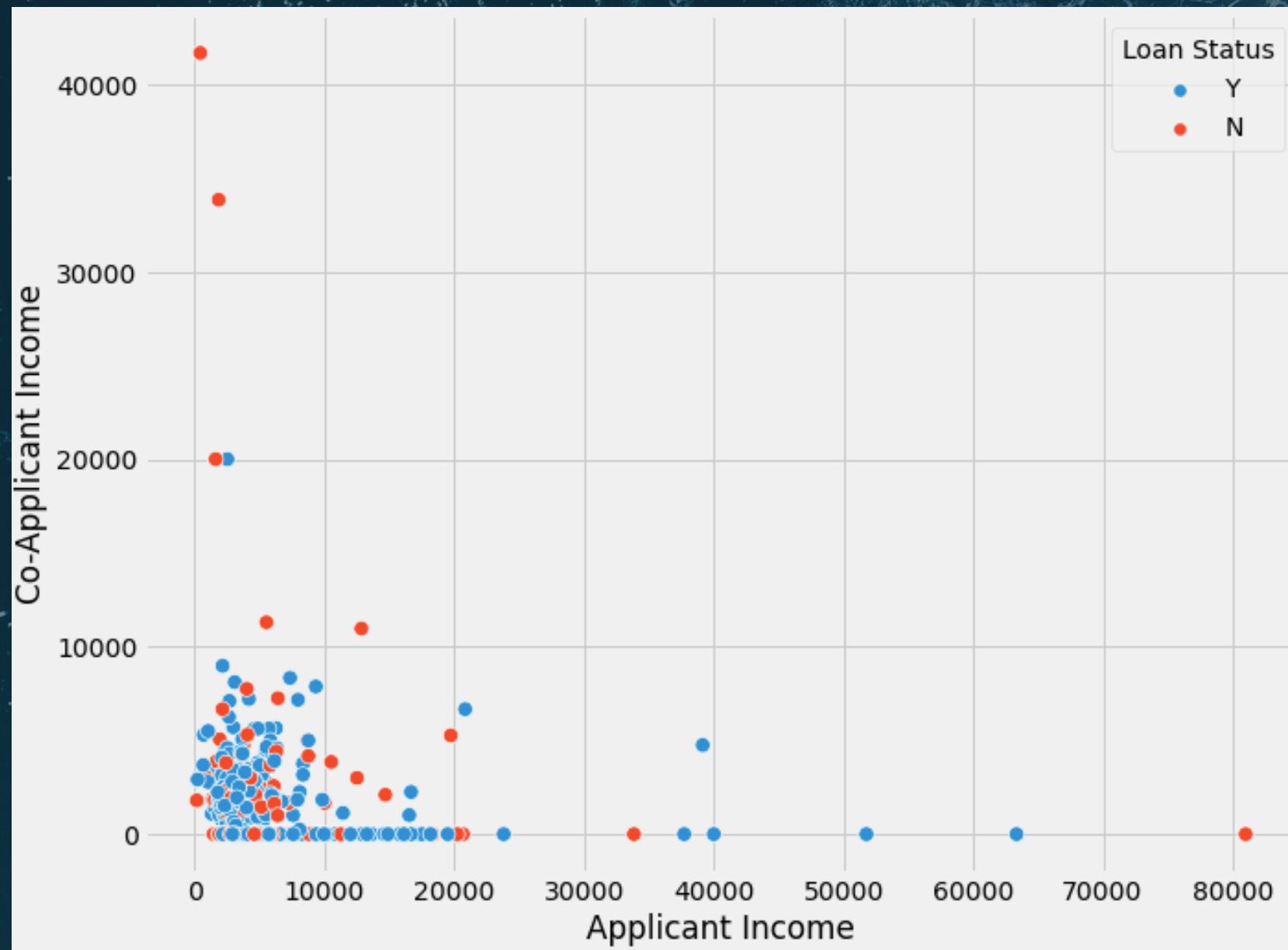
# *credit history*



A credit history is a record of a borrower's responsible repayment of debts.



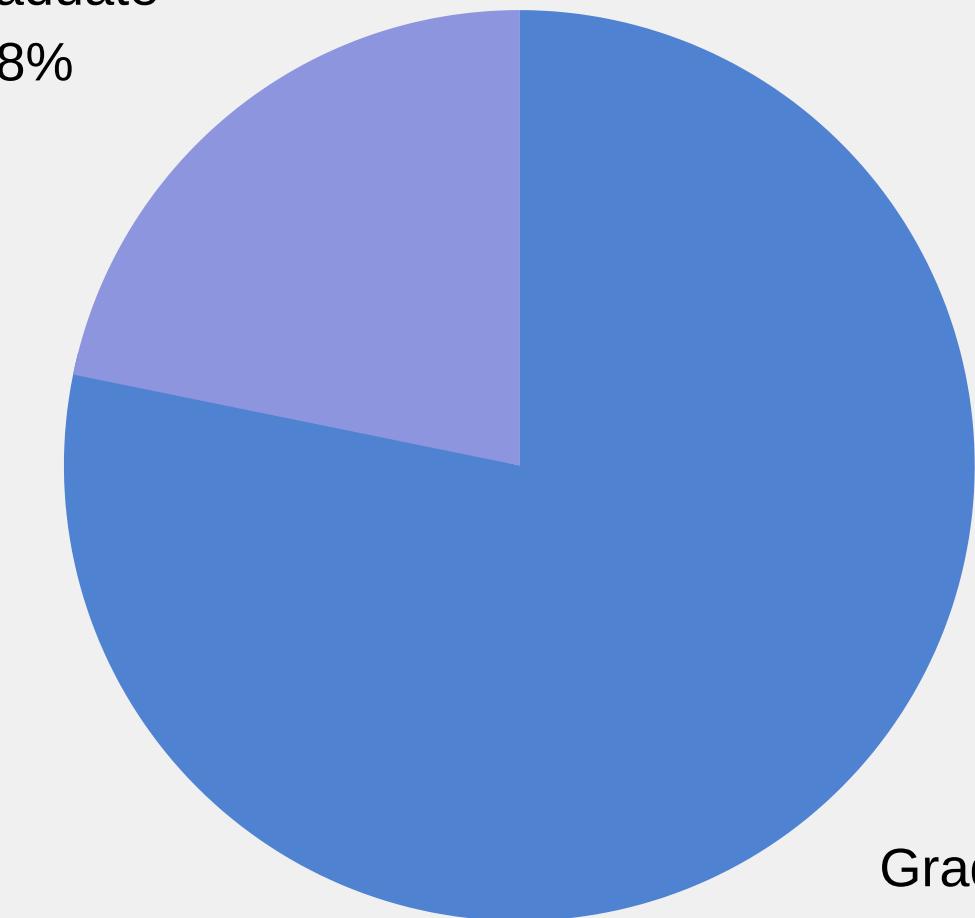
# *income*



# *education level*

Not Graduate

21.8%



Graduate  
78.2%

500

400

300

200

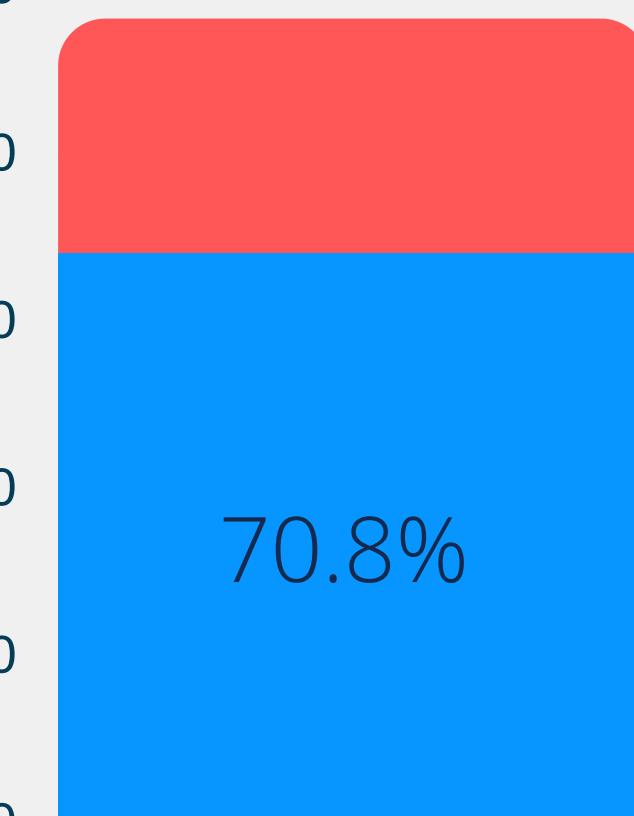
100

0

Loan Status

- Y
- N

70.8%

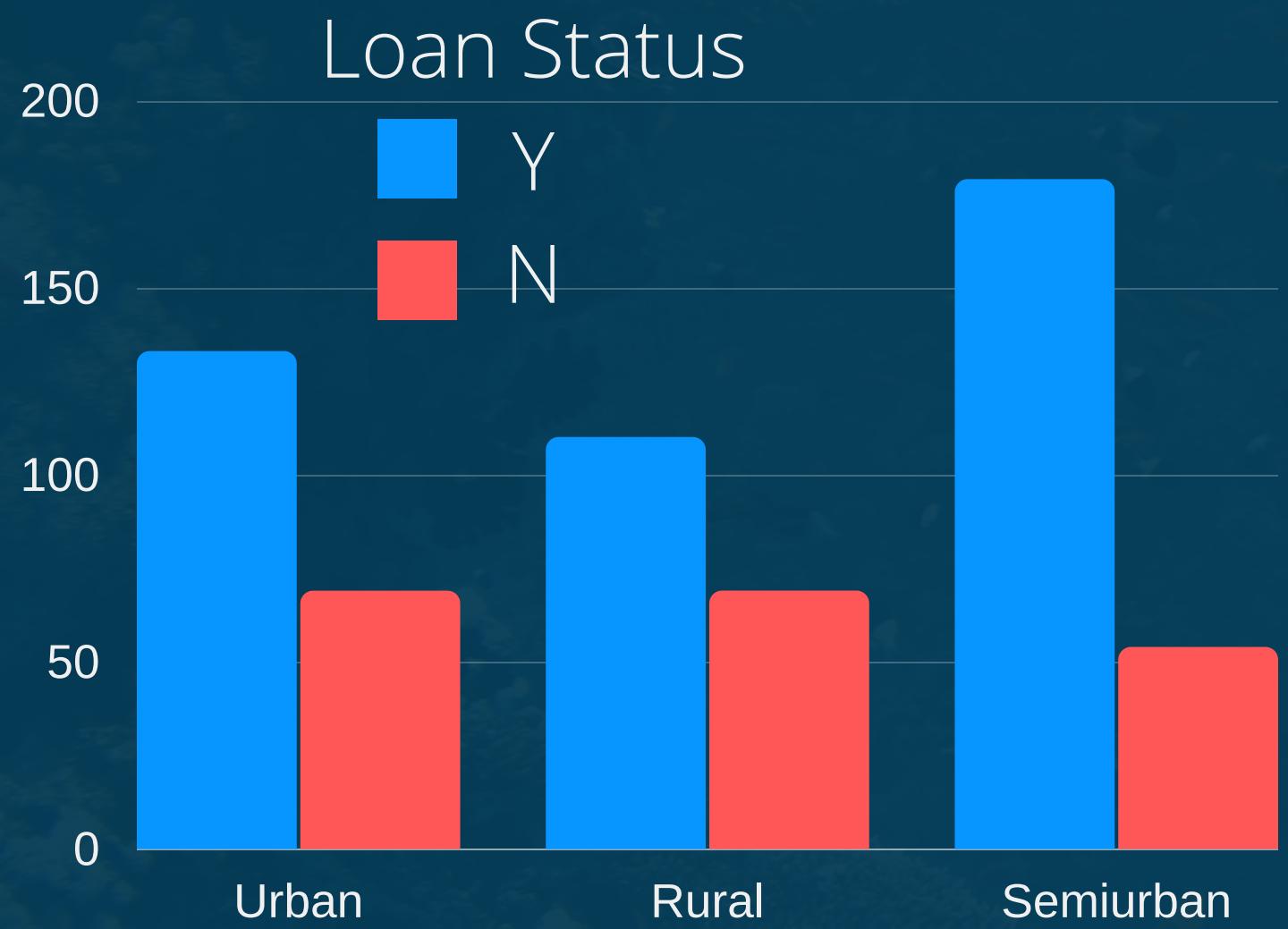


Graduate

Not Graduate

61.2%

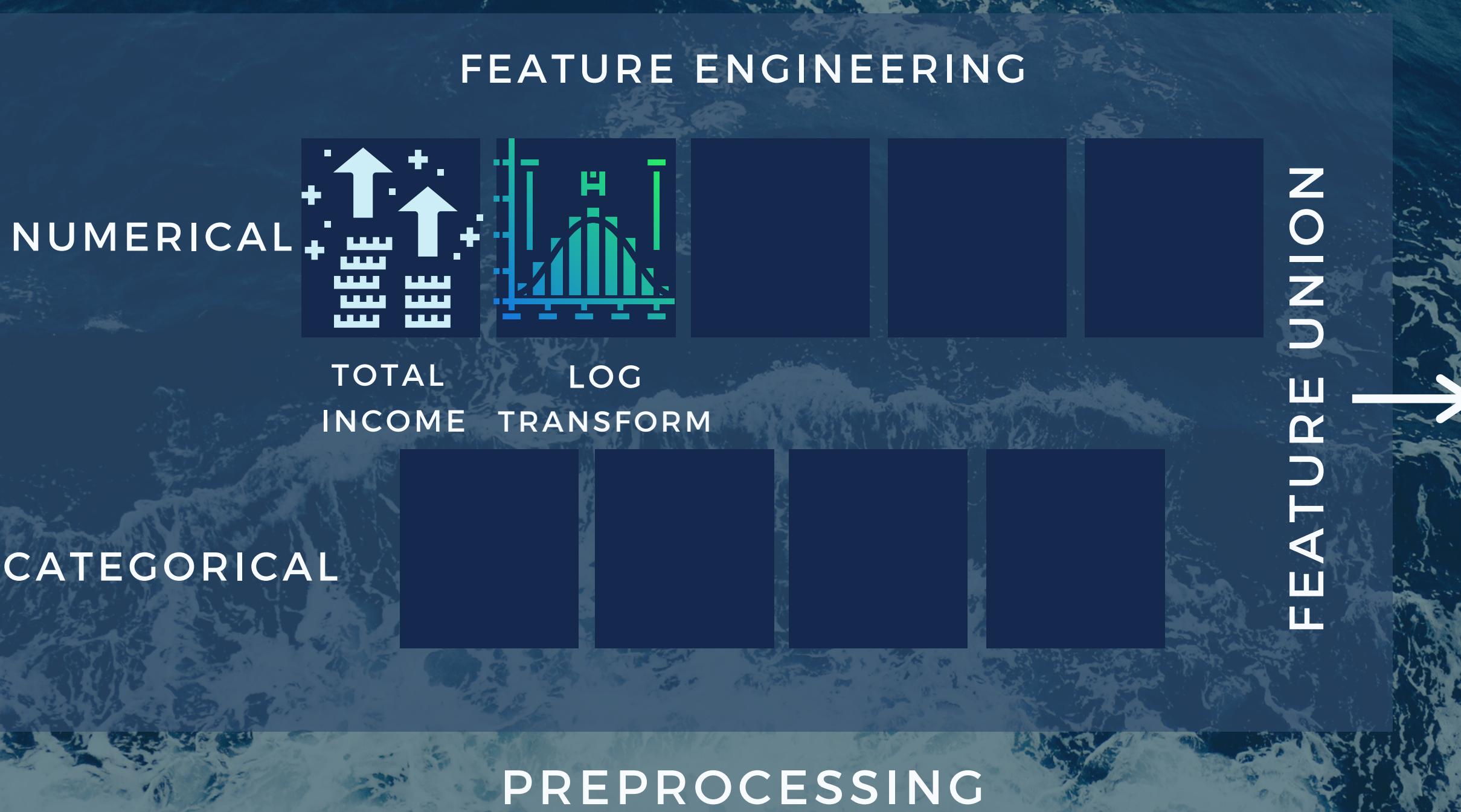
# *property area*



# Pipeline Development



# Pipeline Development



# Pipeline Development



MODEL TUNING

# Pipeline Development

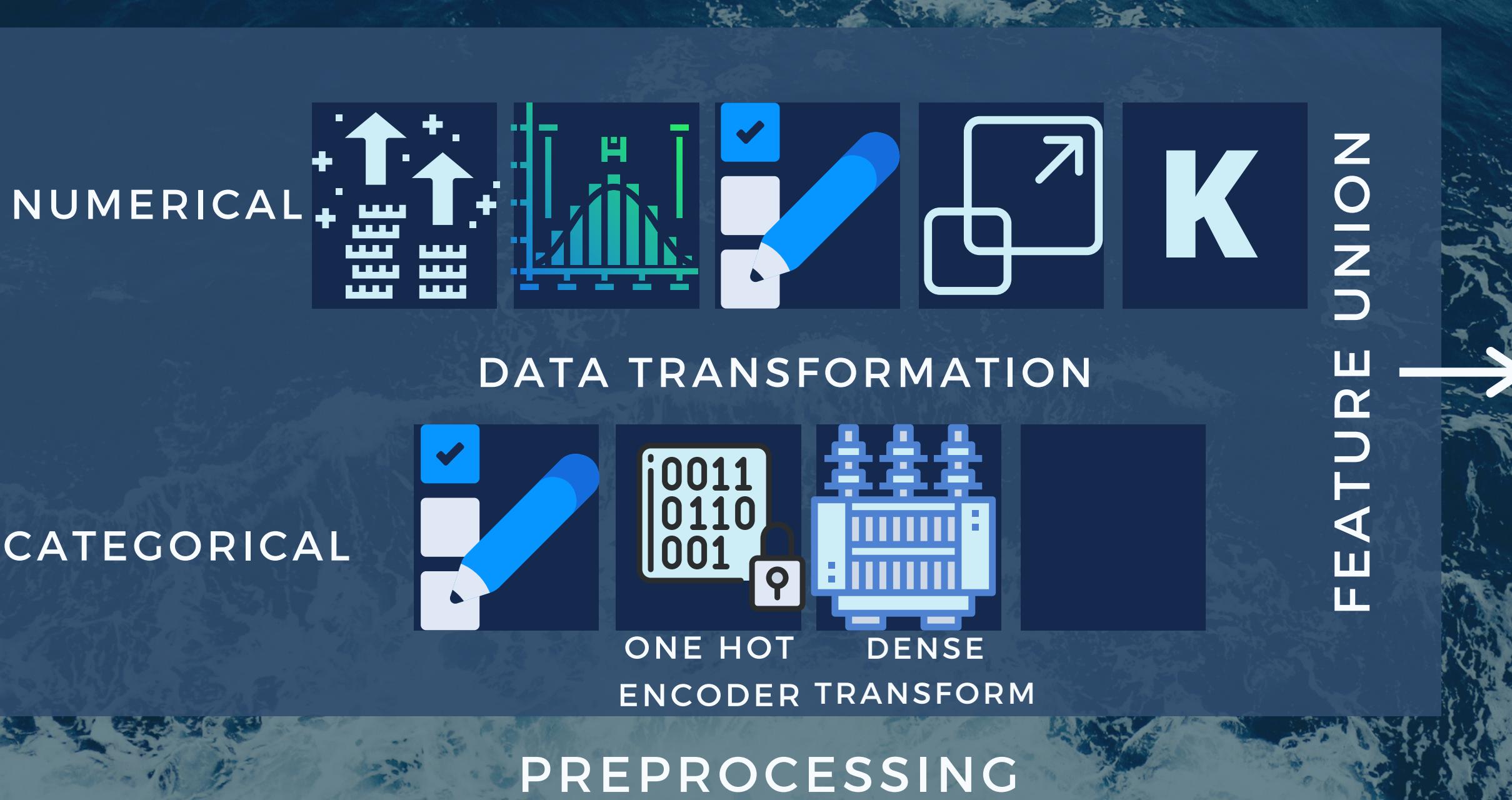


# Pipeline Development



MODEL TUNING

# Pipeline Development

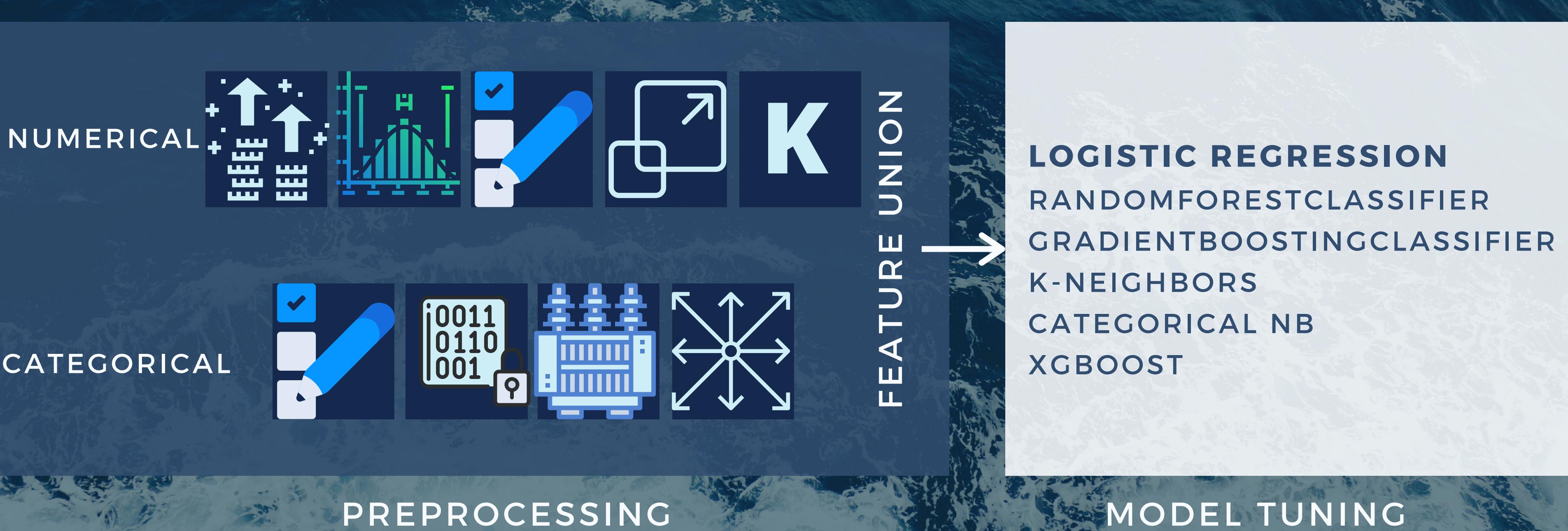


# Pipeline Development



MODEL TUNING

# Pipeline Development



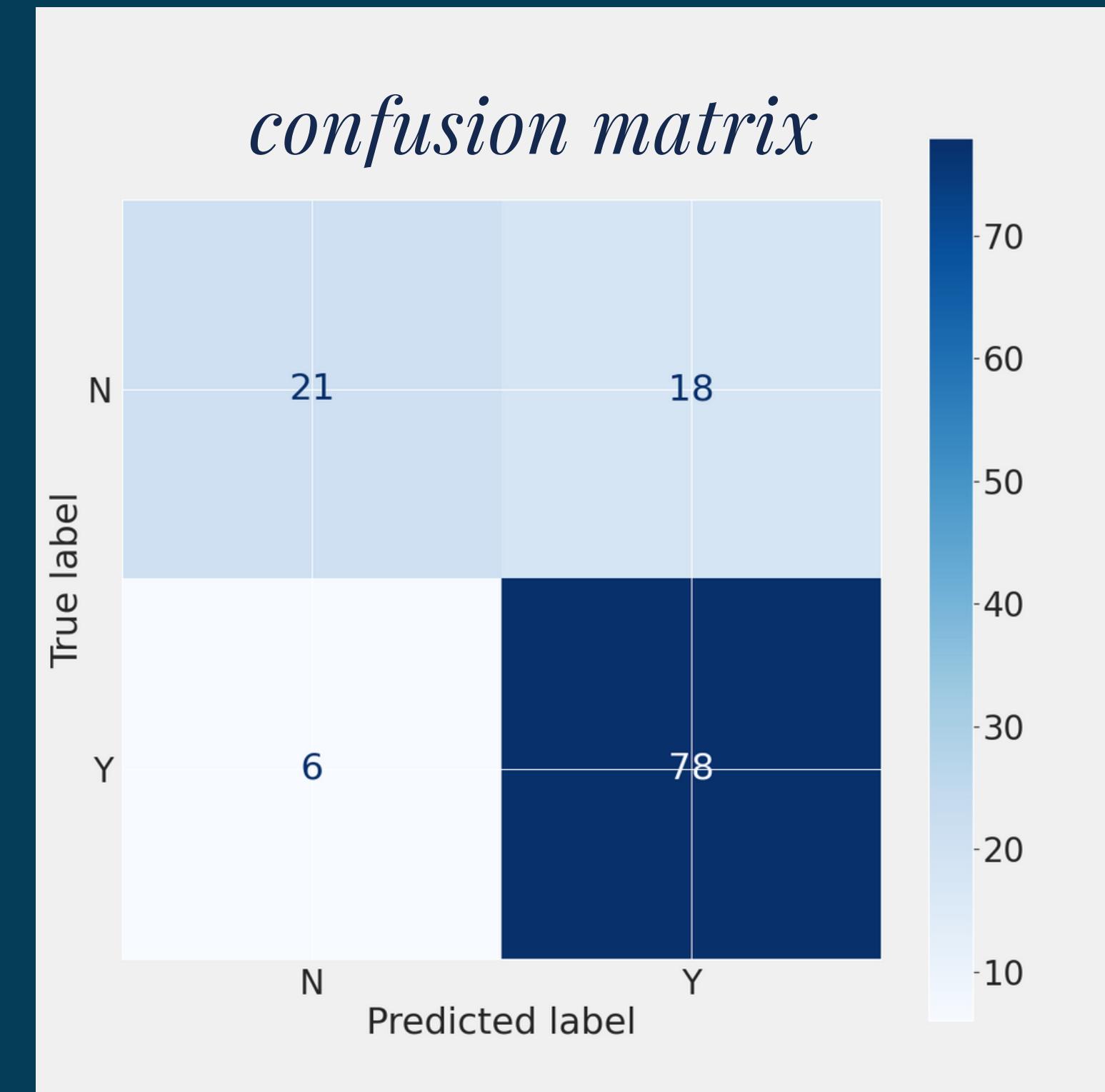
# Best Model Loan Status

80.5%

*accuracy*

78.5%

*AUC score*



# Deployment to Cloud (AWS)

The screenshot shows the Postman application interface for testing an API deployment to AWS. The top navigation bar includes 'POST', 'ec2-', and '.compute.amazonaws.com:5555/predict'. The 'Body' tab is selected, showing a JSON payload with 14 key-value pairs. The response section shows a status of 200 OK with a response body containing a single key 'loan status' with value 'Y'.

POST ec2-.compute.amazonaws.com:5555/predict

Send

Params Authorization Headers (8) Body ● Pre-request Script Tests Settings Cookies

none form-data x-www-form-urlencoded raw binary GraphQL JSON Beautify

```
1
2 {
3     "Loan_ID": "LP001001",
4     "Gender": "Male",
5     "Married": "Yes",
6     "Dependents": "2",
7     "Education": "Not Graduate",
8     "Self_Employed": "Yes",
9     "ApplicantIncome": 25849,
10    "CoapplicantIncome": 0.0,
11    "LoanAmount": 300.0,
12    "Loan_Amount_Term": 24.0,
13    "Credit_History": 1.0,
14    "Property_Area": "Rural"
```

Body Cookies Headers (4) Test Results

Status: 200 OK Time: 1195 ms Size: 169 B Save Response

Pretty Raw Preview Visualize JSON

```
1 {
2     "loan status": "['Y']"
3 }
```

# Challenges & Improvements

## CHALLENGES

Learning how to upload  
my pickled model and  
then predict on it within  
the flask api on the cloud

## MODEL IMPROVEMENTS

Continued iterations of  
feature selection,  
feature importance to  
improve overall model  
performance