Predicting Waterpoint Functionality in Tanzania

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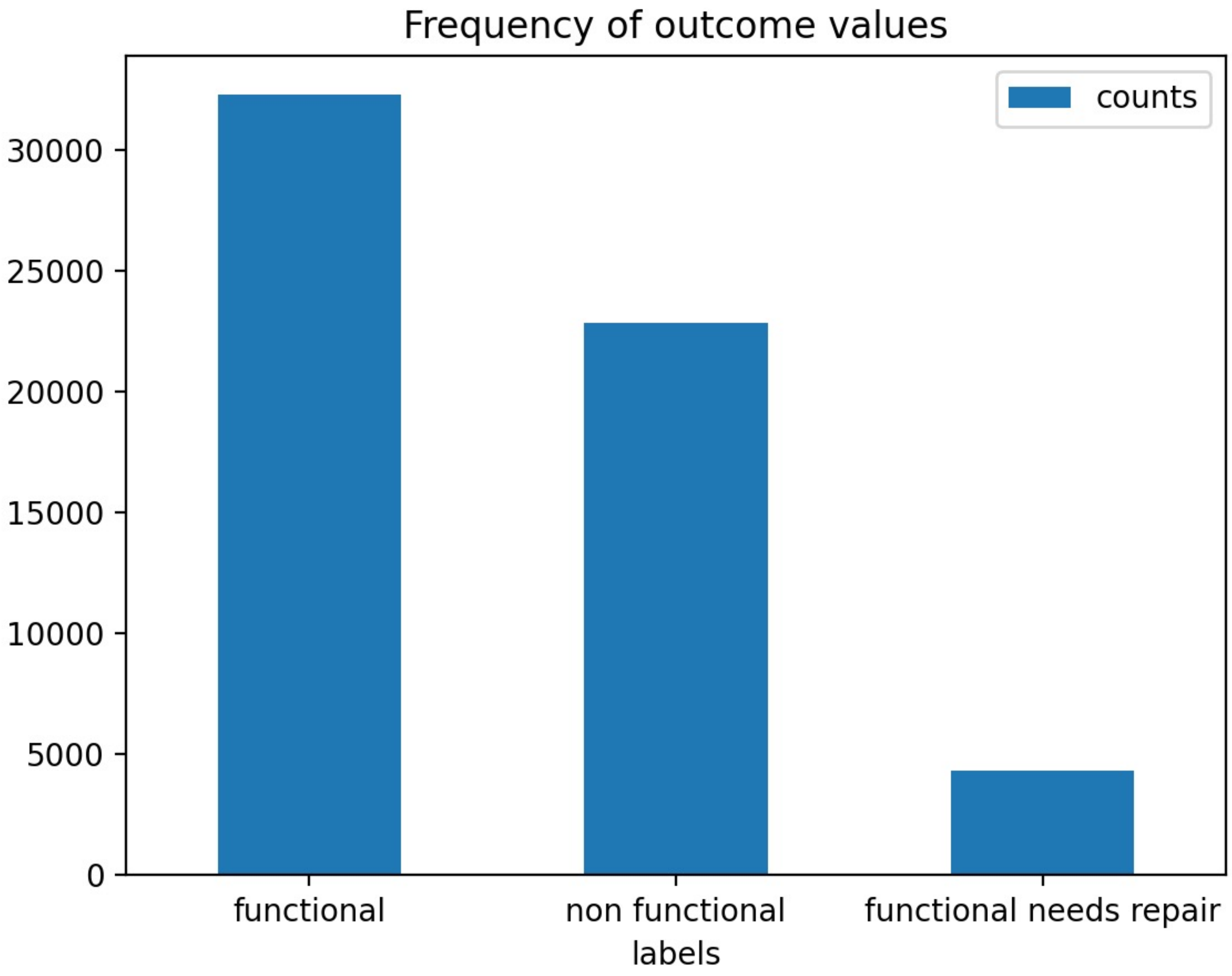
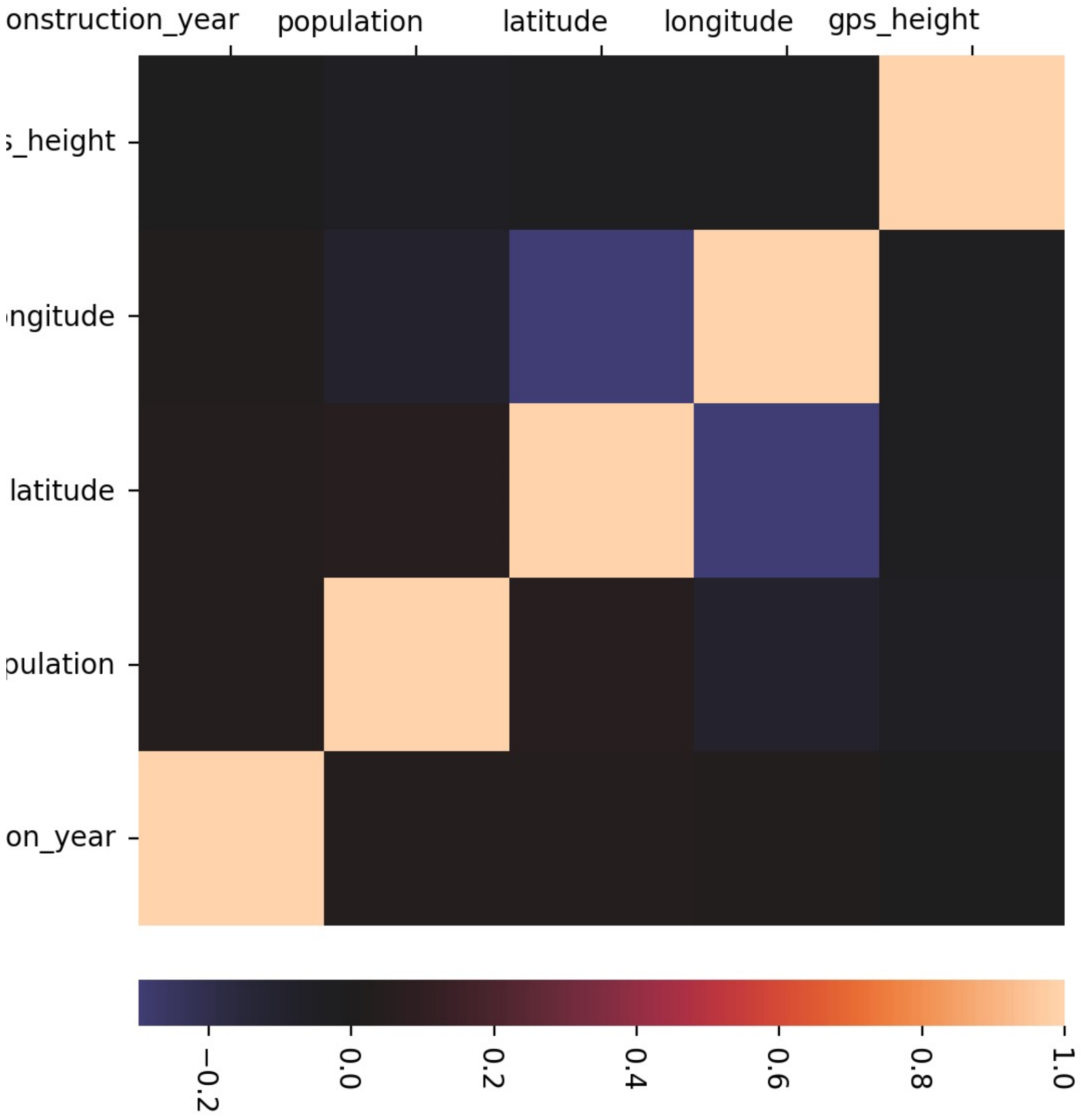
Flat Iron - Data Science

Module 3

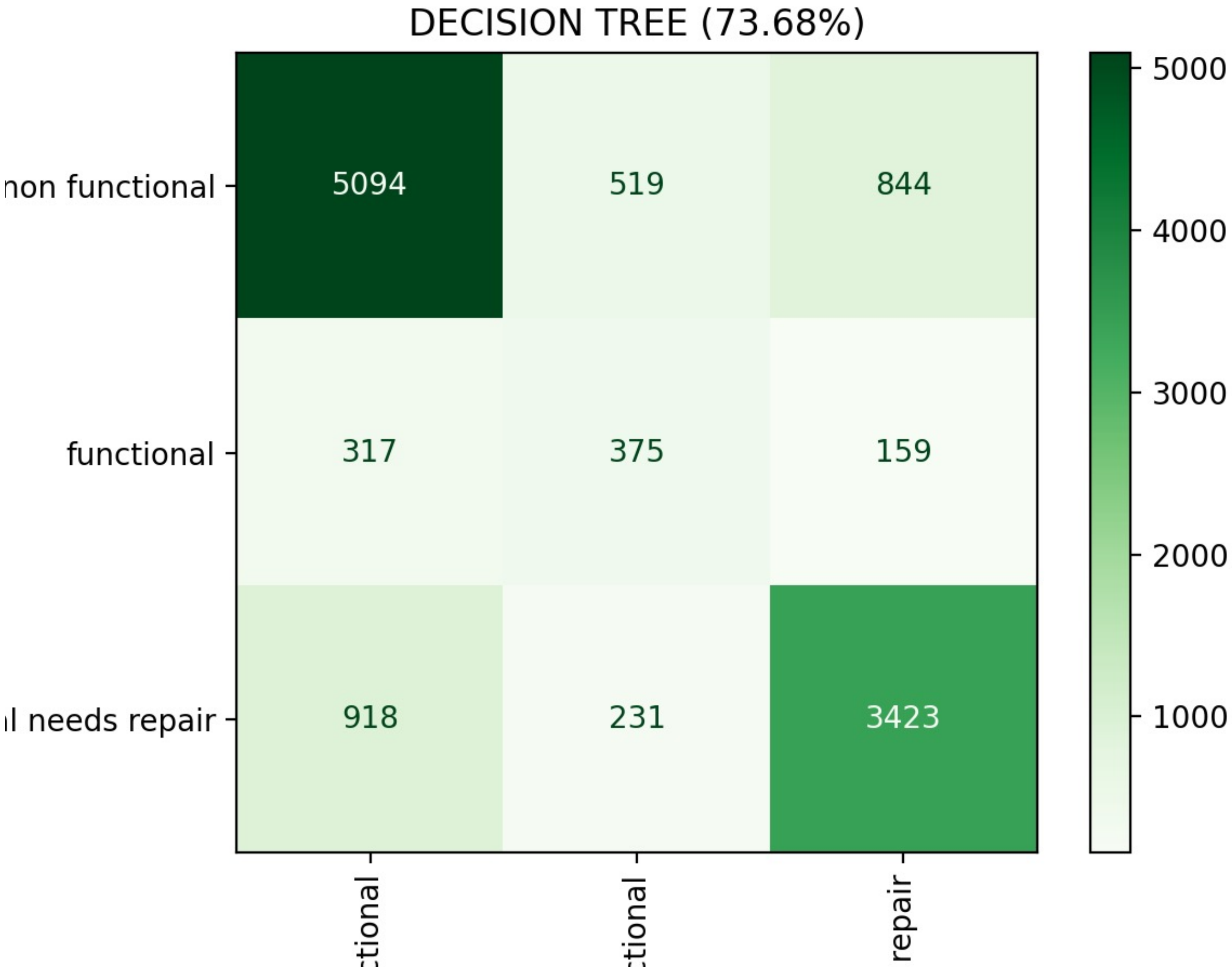
Research Question

Given a set of waterpoint characteristics, can we accurately predict whether that waterpoint is functional, non-functional, or functional but in need of repair?

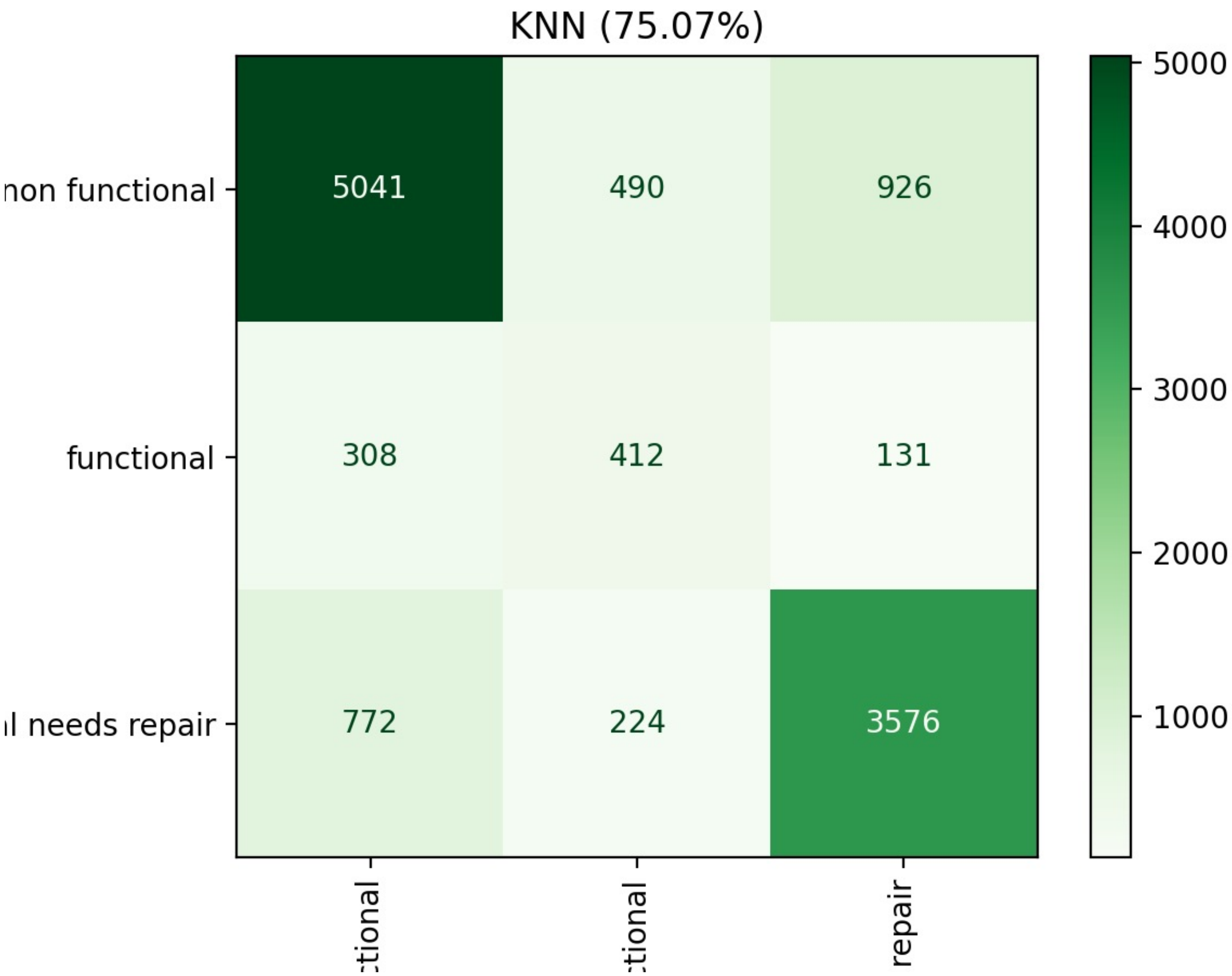

Frequency of outcome values
counts
30000
25000
20000
15000
10000
5000
0
functional
non functional
functional needs repair
labels


onstruction_year
population
latitude
longitude
gps_height
_height
ngitude
latitude
pulation
on_year
−0.2
0.0
0.2
0.4
0.6
0.8
1.0

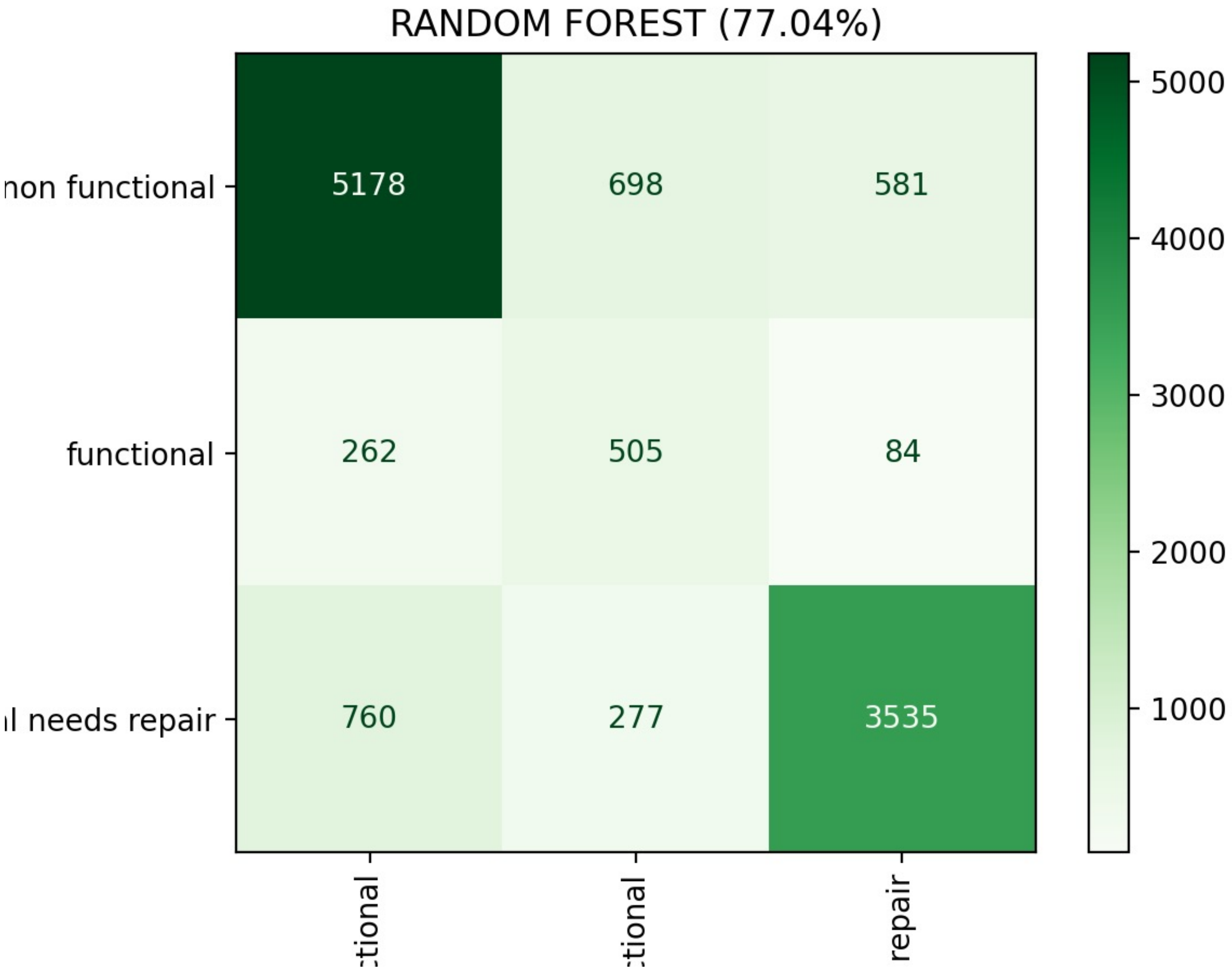
Evaluating the model: *Decision Tree*



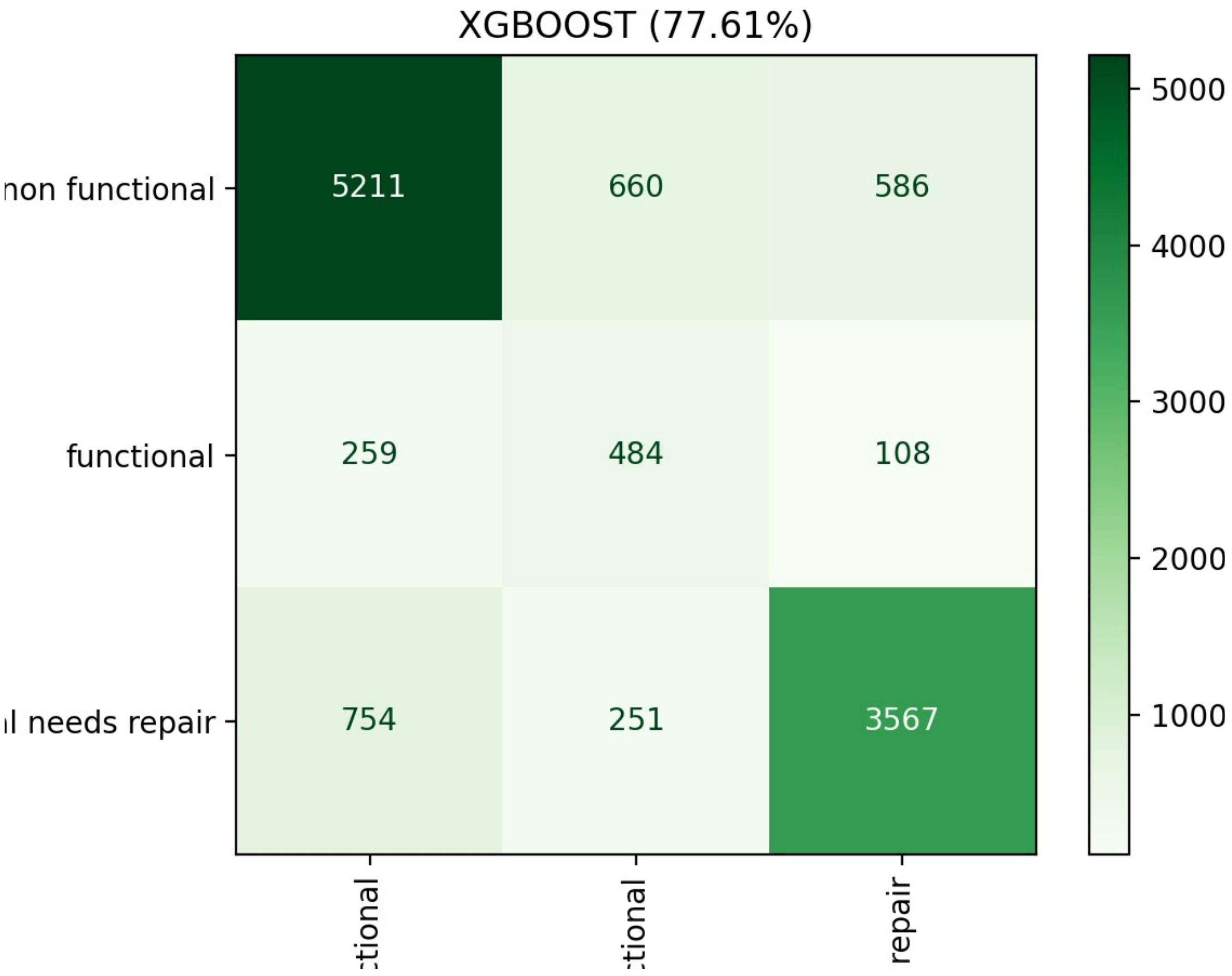
Evaluating the model: KNN



Evaluating the model: *Random Forest*



Evaluating the model: *XGBoost*



XGBOOST (77.61%)

	tional	tional	repair
non functional	5211	660	586
functional	259	484	108
l needs repair	754	251	3567

Take-aways

- Although XGBoost and Random Forest produced very very similar accuracy scores, XGBoost *slightly* (0.2%) outperformed Random Forest.
- The intensive memory requirements of these classifiers would be best served using cloud computing resources.

Future avenues for exploration

- Does inclusion of elevation enhance the model's predictive accuracy?
- What is the effect of including frequency of conflict incidences related to water-resource usage?

Sources

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Thank you!