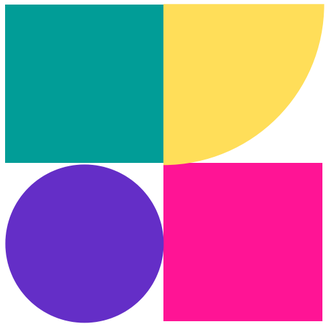


Galaxy Watch

Predicting calories using machine learning model

by Sardorbek Zokirov and Abubakr Mamajonov

Progress Tracker

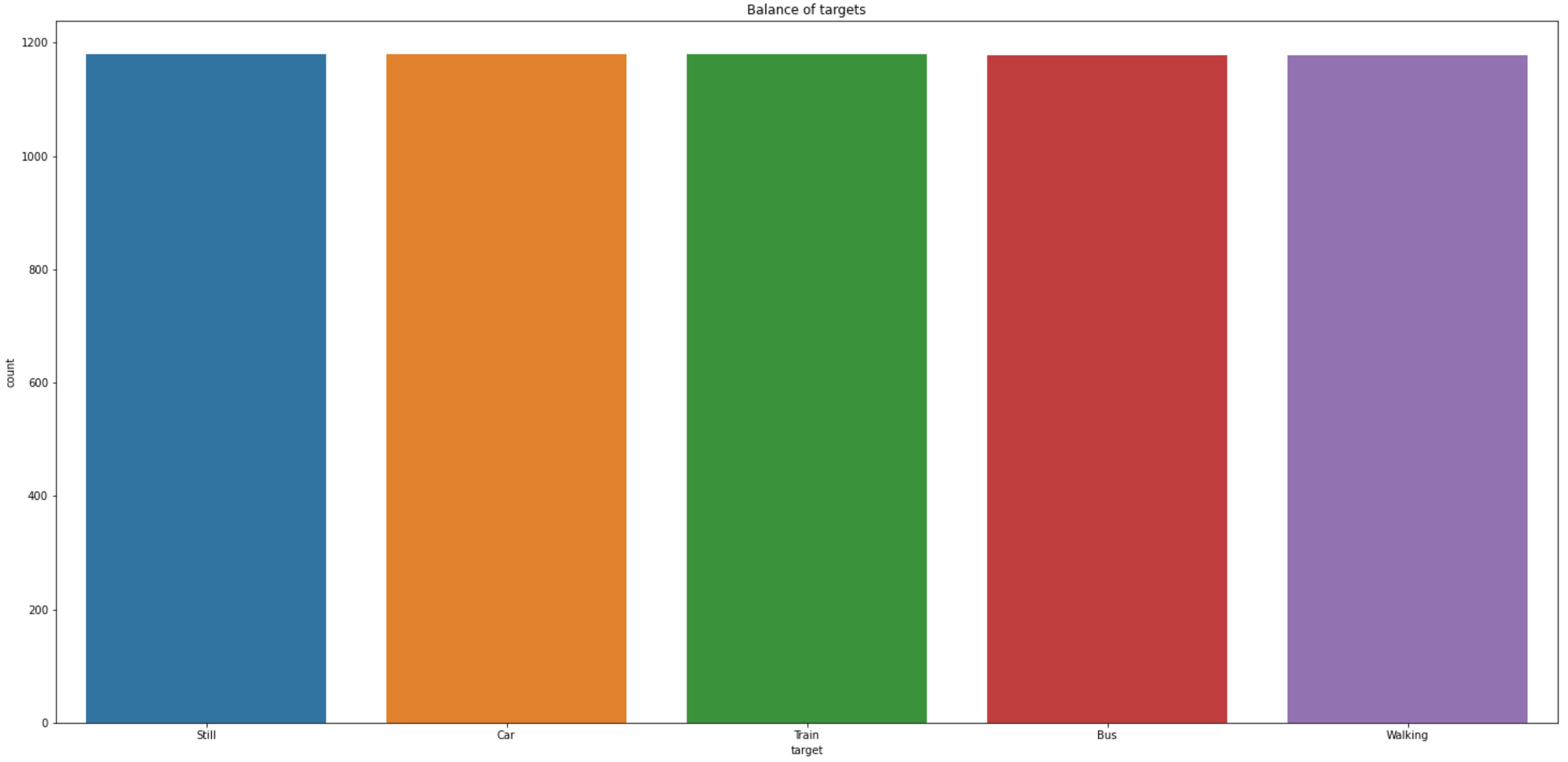
Task analysis **EDA** **Benchmark** **Models** **Feature engineering, model improvement** **Application**

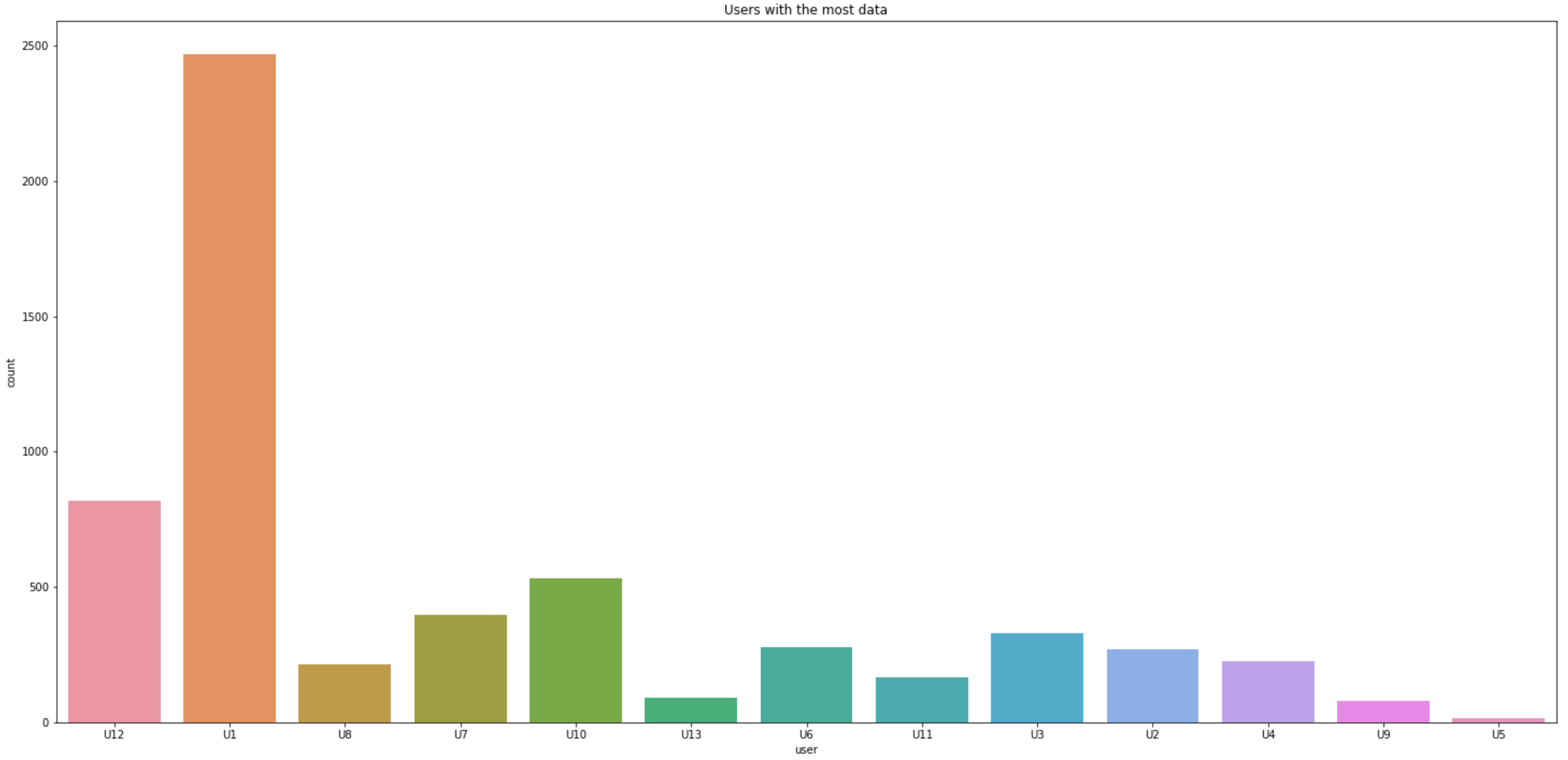
We have analyzed the task, analyzed the data and performed EDA to understand our assignment .

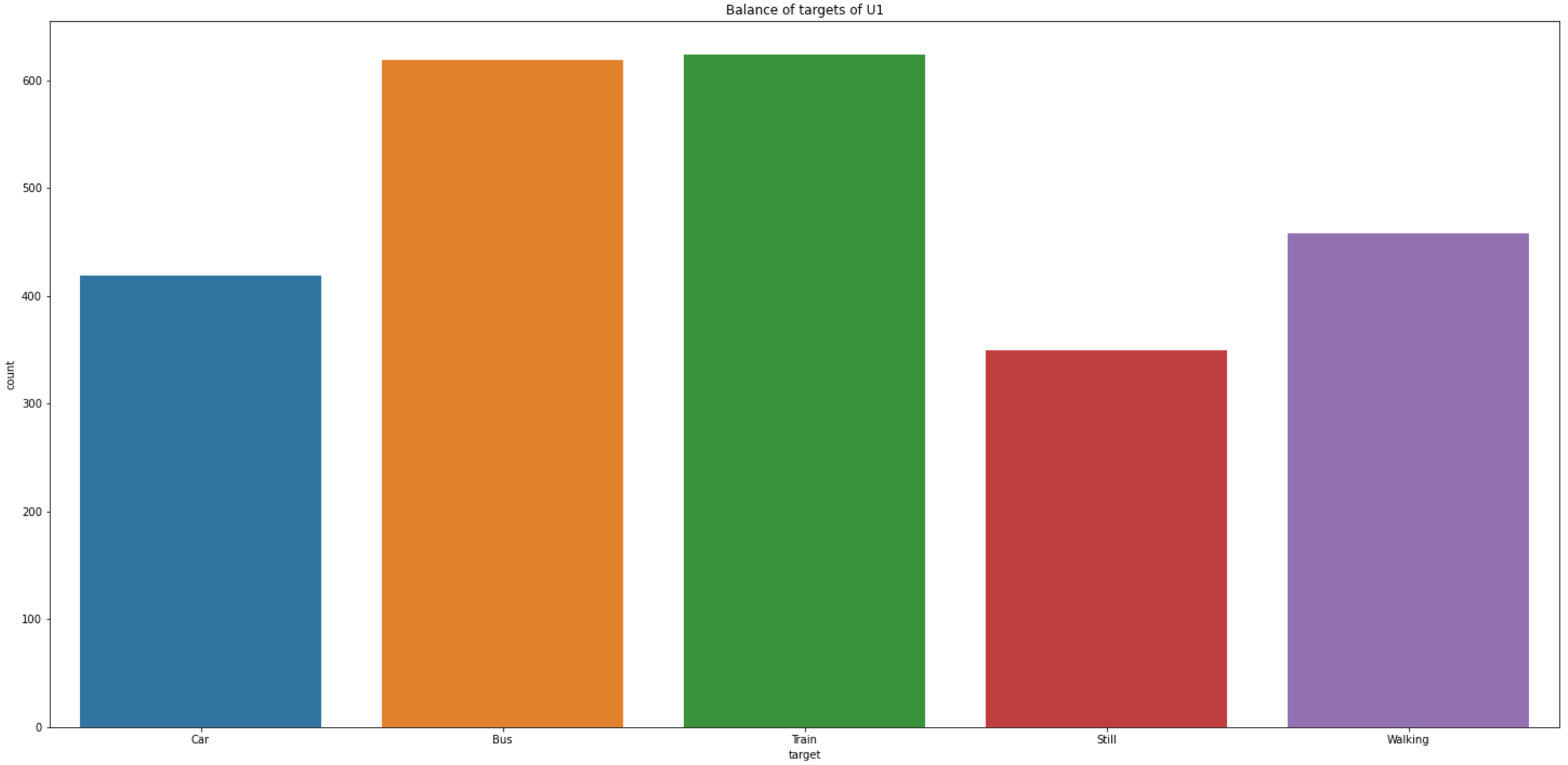
Created a benchmark model with initial data and detected improvement points

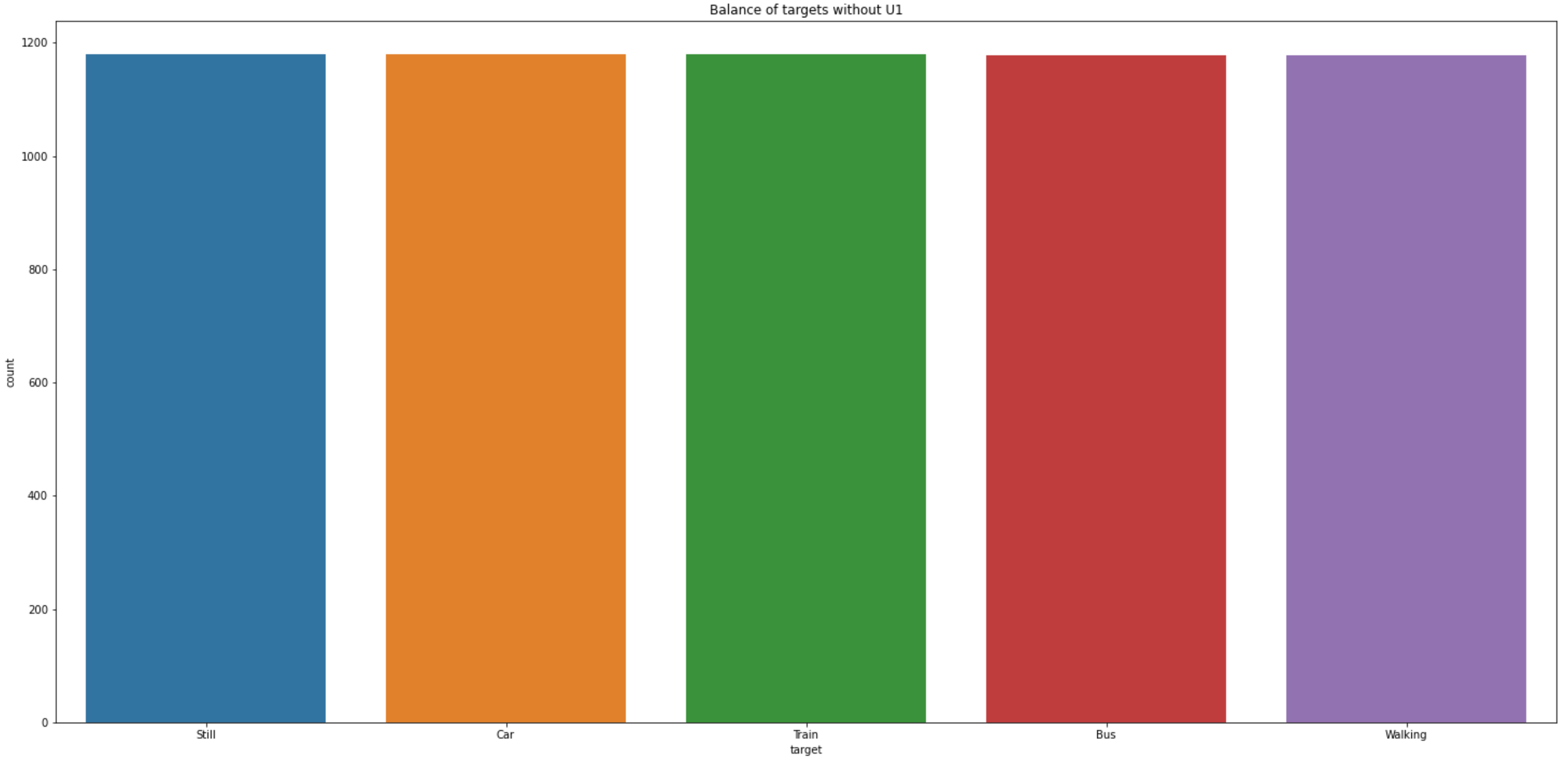
Working on model performance and feature engineering to make sure our model is performing as good as possible

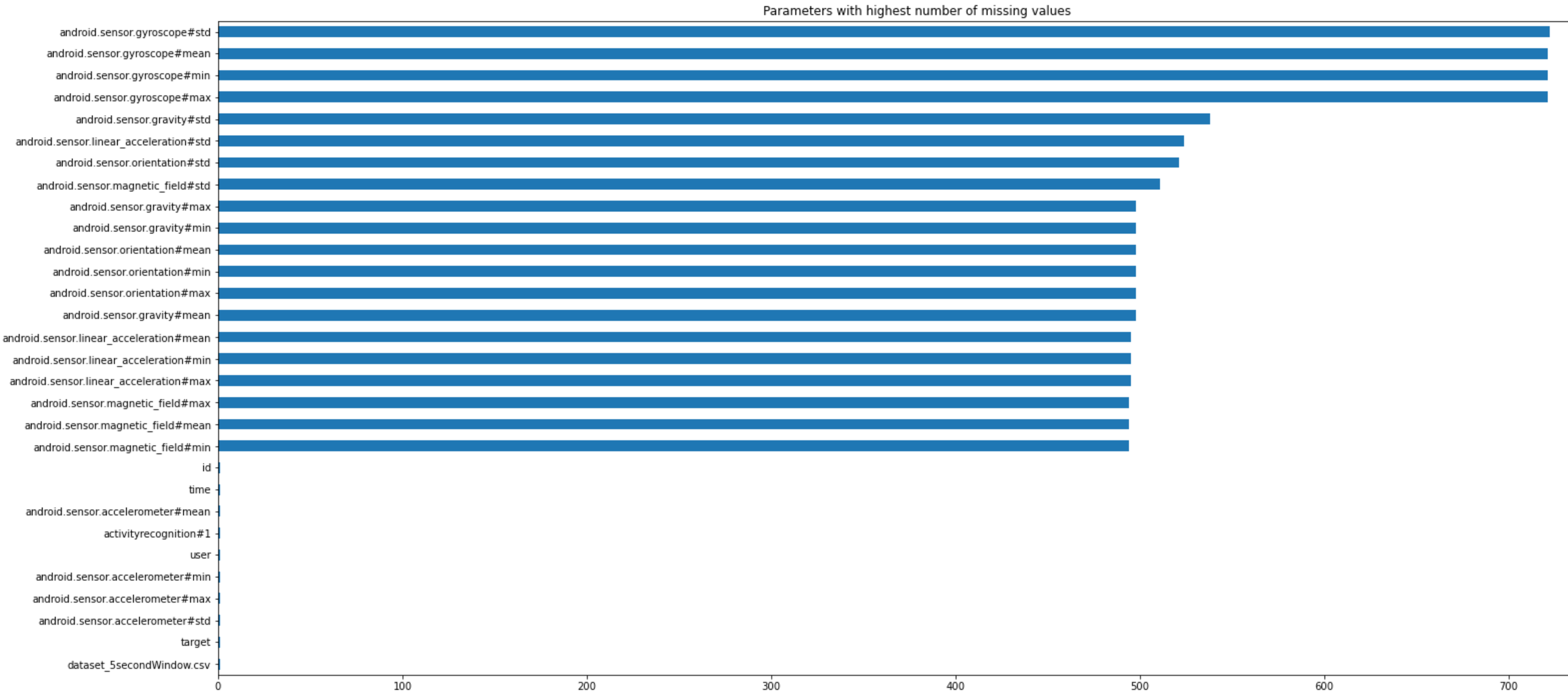
Create an application with the ML model we have trained for end users

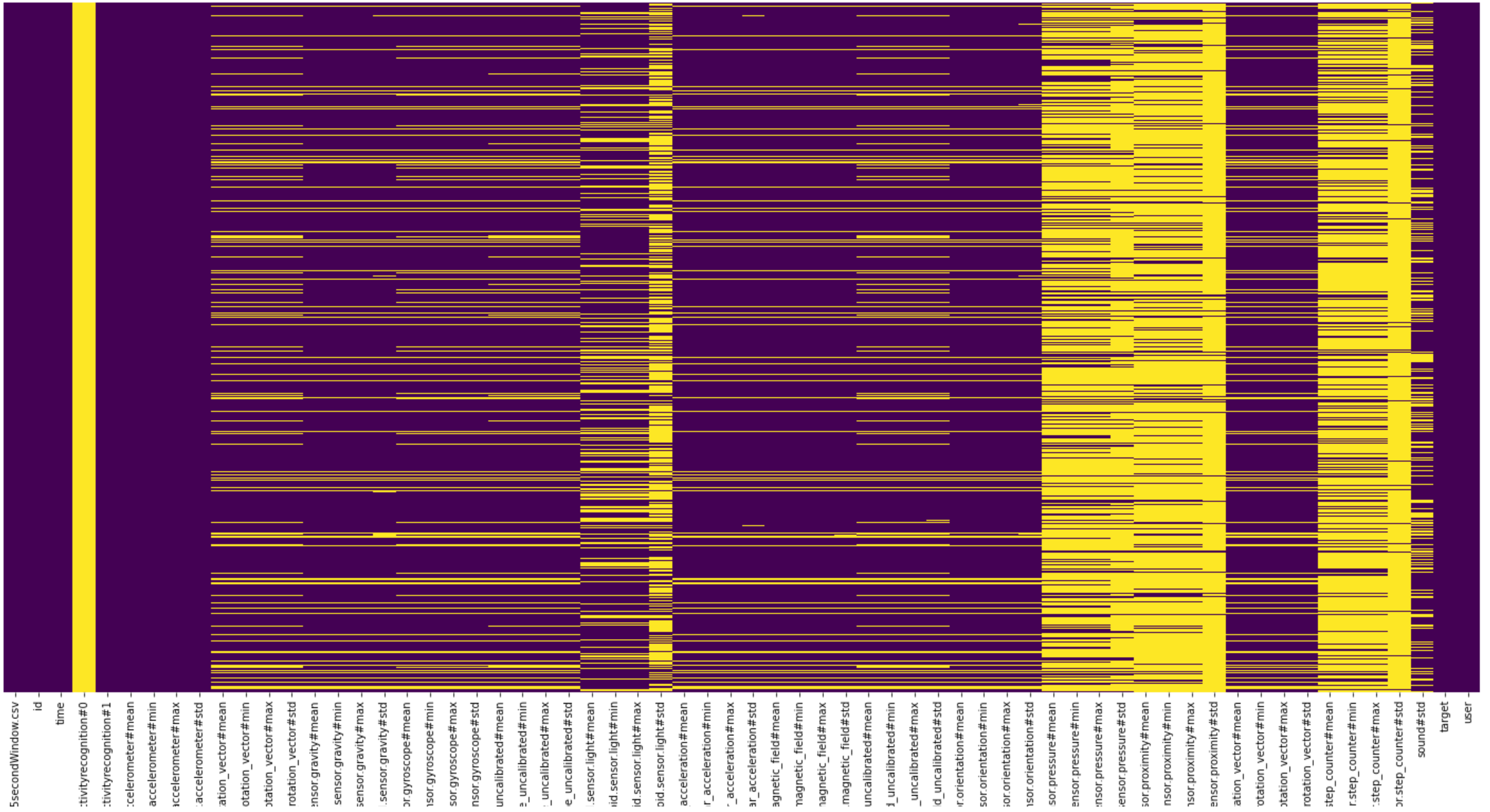

Balance of targets
1200
1000
800
600
400
200
0
count
Still
Car
Train
Bus
Walking
target

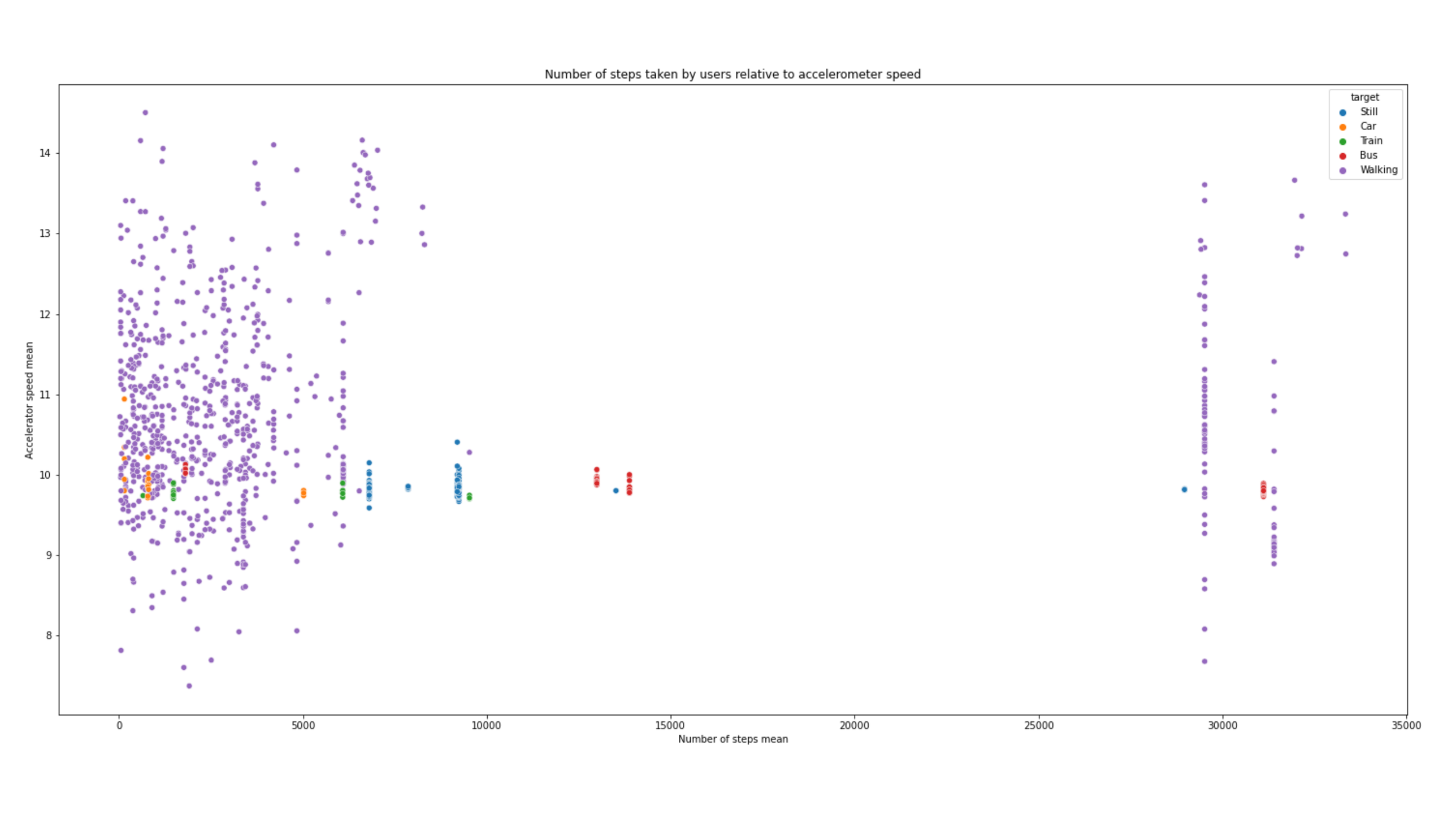

Users with the most data
count
2500
2000
1500
1000
500
0
U12
U1
U8
U7
U10
U13
U6
U11
U3
U2
U4
U9
U5
user

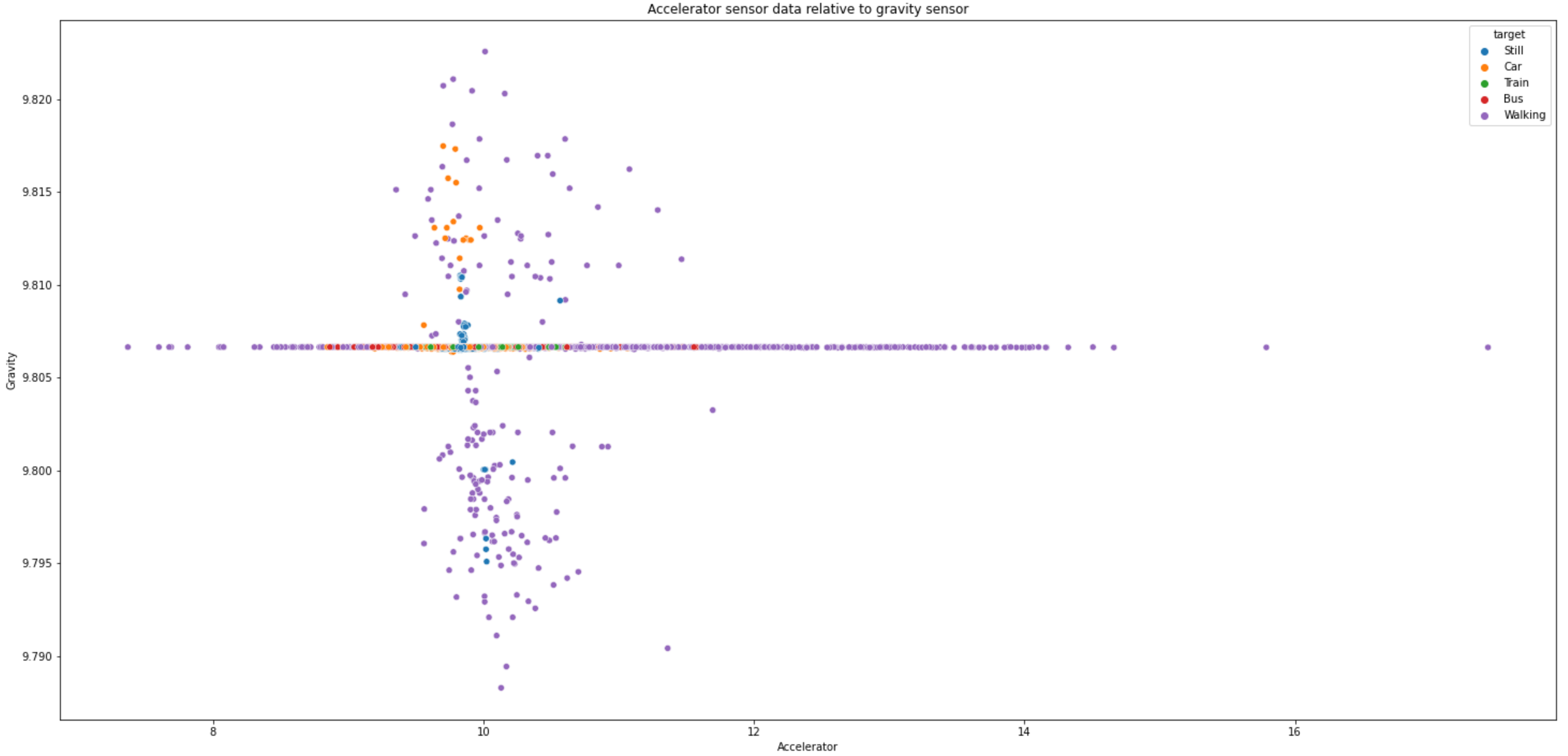

Balance of targets of U1
count
0
100
200
300
400
500
600
Car
Bus
Train
Still
Walking
target

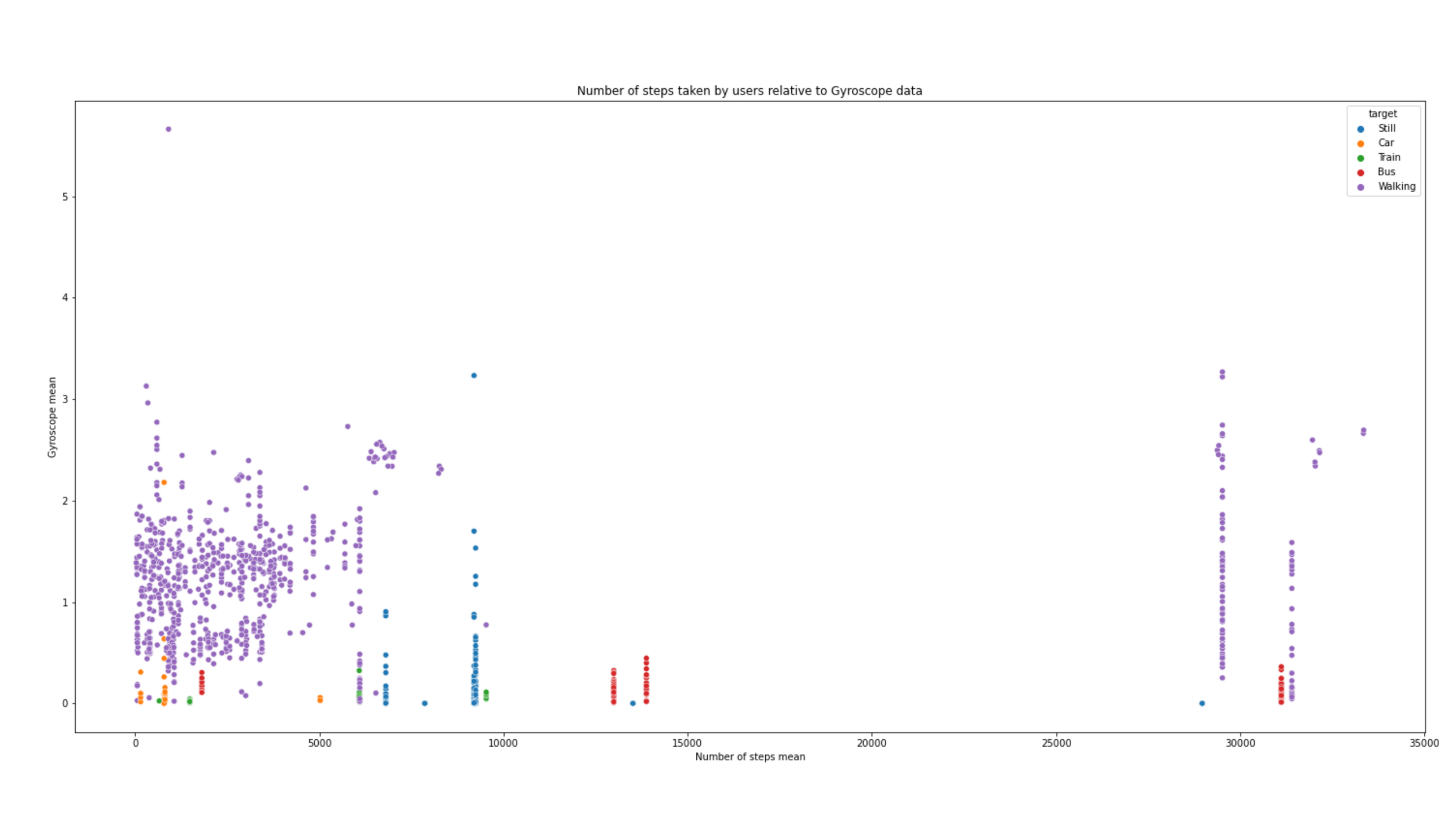

Balance of targets without U1
1200
1000
800
600
400
200
0
count
Still
Car
Train
Bus
Walking
target


Parameters with highest number of missing values
android.sensor.gyroscope#std
android.sensor.gyroscope#mean
android.sensor.gyroscope#min
android.sensor.gyroscope#max
android.sensor.gravity#std
android.sensor.linear_acceleration#std
android.sensor.orientation#std
android.sensor.magnetic_field#std
android.sensor.gravity#max
android.sensor.gravity#min
android.sensor.orientation#mean
android.sensor.orientation#min
android.sensor.orientation#max
android.sensor.gravity#mean
android.sensor.linear_acceleration#mean
android.sensor.linear_acceleration#min
android.sensor.linear_acceleration#max
android.sensor.magnetic_field#max
android.sensor.magnetic_field#mean
android.sensor.magnetic_field#min
id
time
android.sensor.accelerometer#mean
activityrecognition#1
user
android.sensor.accelerometer#min
android.sensor.accelerometer#max
android.sensor.accelerometer#std
target
dataset_5secondWindow.csv
0
100
200
300
400
500
600
700


Heatmap of NaN values
5secondWindow.csv
id
time
ctivityrecognition#0
ctivityrecognition#1
celerometer#mean
celerometer#min
celerometer#max
celerometer#std
ation_vector#mean
otation_vector#min
otation_vector#max
rotation_vector#std
ensor.gravity#mean
sensor.gravity#min
sensor.gravity#max
.sensor.gravity#std
or.gyroscope#mean
nsor.gyroscope#min
sor.gyroscope#max
nsor.gyroscope#std
uncalibrated#mean
e_uncalibrated#min
_uncalibrated#max
e_uncalibrated#std
.sensor.light#mean
id.sensor.light#min
id.sensor.light#max
oid.sensor.light#std
acceleration#mean
r_acceleration#min
_acceleration#max
ar_acceleration#std
agnetic_field#mean
nagnetic_field#min
nagnetic_field#max
.magnetic_field#std
uncalibrated#mean
d_uncalibrated#min
_uncalibrated#max
id_uncalibrated#std
r.orientation#mean
sor.orientation#min
or.orientation#max
nsor.orientation#std
sor.pressure#mean
ensor.pressure#min
nsor.pressure#max
sensor.pressure#std
sor.proximity#mean
nsor.proximity#min
nsor.proximity#max
ensor.proximity#std
ation_vector#mean
otation_vector#min
otation_vector#max
rotation_vector#std
tep_counter#mean
r.step_counter#min
:step_counter#max
or.step_counter#std
sound#std
target
user


Number of steps taken by users relative to accelerometer speed
target
Still
Car
Train
Bus
Walking
Accelerator speed mean
Number of steps mean
14
13
12
11
10
9
8
0
5000
10000
15000
20000
25000
30000
35000


Accelerator sensor data relative to gravity sensor
target
Still
Car
Train
Bus
Walking
9.820
9.815
9.810
9.805
9.800
9.795
9.790
Gravity
8
10
12
14
16
Accelerator


Number of steps taken by users relative to Gyroscope data
target
Still
Car
Train
Bus
Walking
Gyroscope mean
Number of steps mean
0
1
2
3
4
5
0
5000
10000
15000
20000
25000
30000
35000

Model performances

Model	Accuracy	Balanced accuracy	Time
Extra trees	93.765182	92.715866	0.509721
Random Forest	87.408907	90.669303	1.102714
Decision Tree	78.825911	84.894997	0.099731