**1. Auto Insurance Project:**

**Model: Random Forest with Randomoversample data**  
====================  
Confusion Matrix  
====================  
[[39155   148]  
 [ 2461  4753]]  
=====================  
Classification report  
=====================  
              precision    recall  f1-score   support             
           1       0.97      0.66      0.78      7214

0       0.94      1.00      0.97     39303

accuracy                           0.94     46517  
   macro avg       0.96      0.83      0.88     46517  
weighted avg       0.95      0.94      0.94     46517

==============  
Test Accuracy: 0.9439129780510351  
===============  
AUC Score: 0.8275460803446549

**2. Predictive Maintenance:**

**Model: XGBoost regression**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | XG Boost (learning\_rate=0.3,n\_estimators=160, max\_depth=1,gamma=0) | | XG Boost  (learning\_rate: 0.1, n\_estimators: 50, max\_depth: 5, gamma=1) | |
|  | r2 score | adjusted r2 score | r2 score | adjusted r2 score |
| Train | 0.72064265 | 0.720439366 | 0.76555 | 0.76528635 |
| Test | 0.71026106 | 0.709415931 | 0.73016 | 0.72946356 |