**Methodology**

1. **Model Implementation**: Implemented Logistic Regression, Decision Tree, and Random Forest models.
2. **Model Tuning**: Tuned hyperparameters using GridSearchCV and cross-validation.
3. **Model Evaluation**: Evaluated models using accuracy, F1-score, classification reports, and confusion matrices.

**Findings**

**metin, ekran görüntüsü, yazı tipi, sayı, numara içeren bir resim

Açıklama otomatik olarak oluşturuldu**

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**Interpretation**

* **Best Performing Model**: Random Forest achieved the highest F1-score (0.6825) and high accuracy (86.24%), indicating its robustness and better handling of class imbalances.
* **Logistic Regression**: Provided a good baseline with 83.01% accuracy but struggled with classifying the minority class.
* **Decision Tree**: Performed well with 86.28% accuracy but had a slightly lower F1-score compared to Random Forest.
* **Random Forest** has a higher number of true positives (2167) and a lower number of false negatives (1253) compared to Logistic Regression (TP: 1568, FN: 1852) and Decision Tree (TP: 1966, FN: 1454). This indicates that Random Forest is better at correctly identifying positive instances (income > 50K), which is crucial in many applications.

**Insights**

* **Random Forest**: Its ensemble approach led to better generalization and reduced overfitting.
* **Hyperparameter Tuning**: Significantly improved model performance across all models.