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Dataset Overview

Dataset Characteristics:

- **Source** UTKFace Dataset on Kaggle
- **Image Format**
- **Resolution**
- **Color Space**
- **File Naming** *[gender]*

Age Classes

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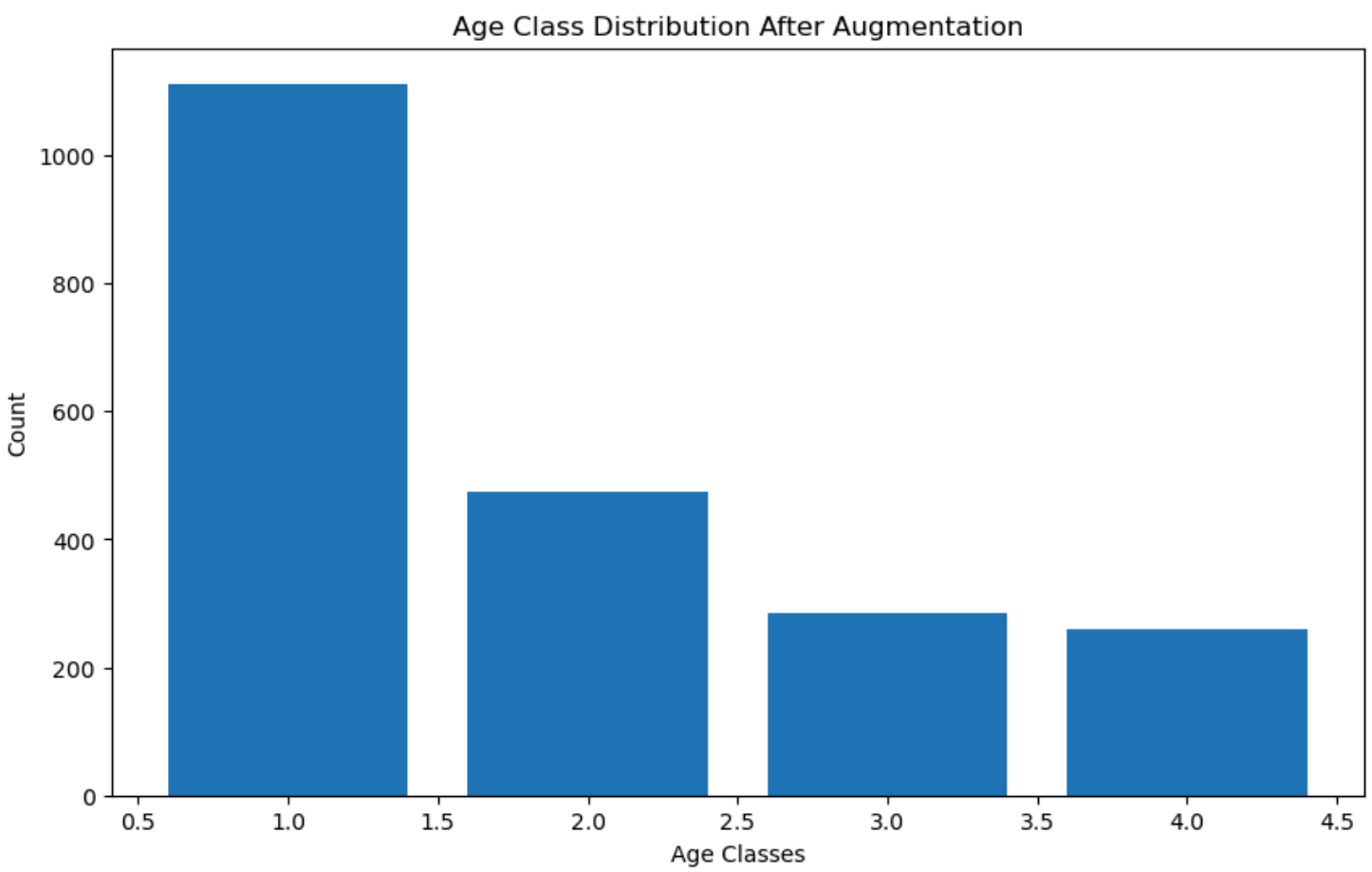
Age Distribution After Augmentation



Distribution of age classes after data augmentation

Code Implementation

Data Preprocessing

1. ### Image Processing

```
# Convert to grayscale and resize
image = Image.open(image_file).convert('L').resize((64, 64))
image = np.array(image) / 255.0
```

2. ### Data Augmentation
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    -
    -
3. ### Feature Engineering
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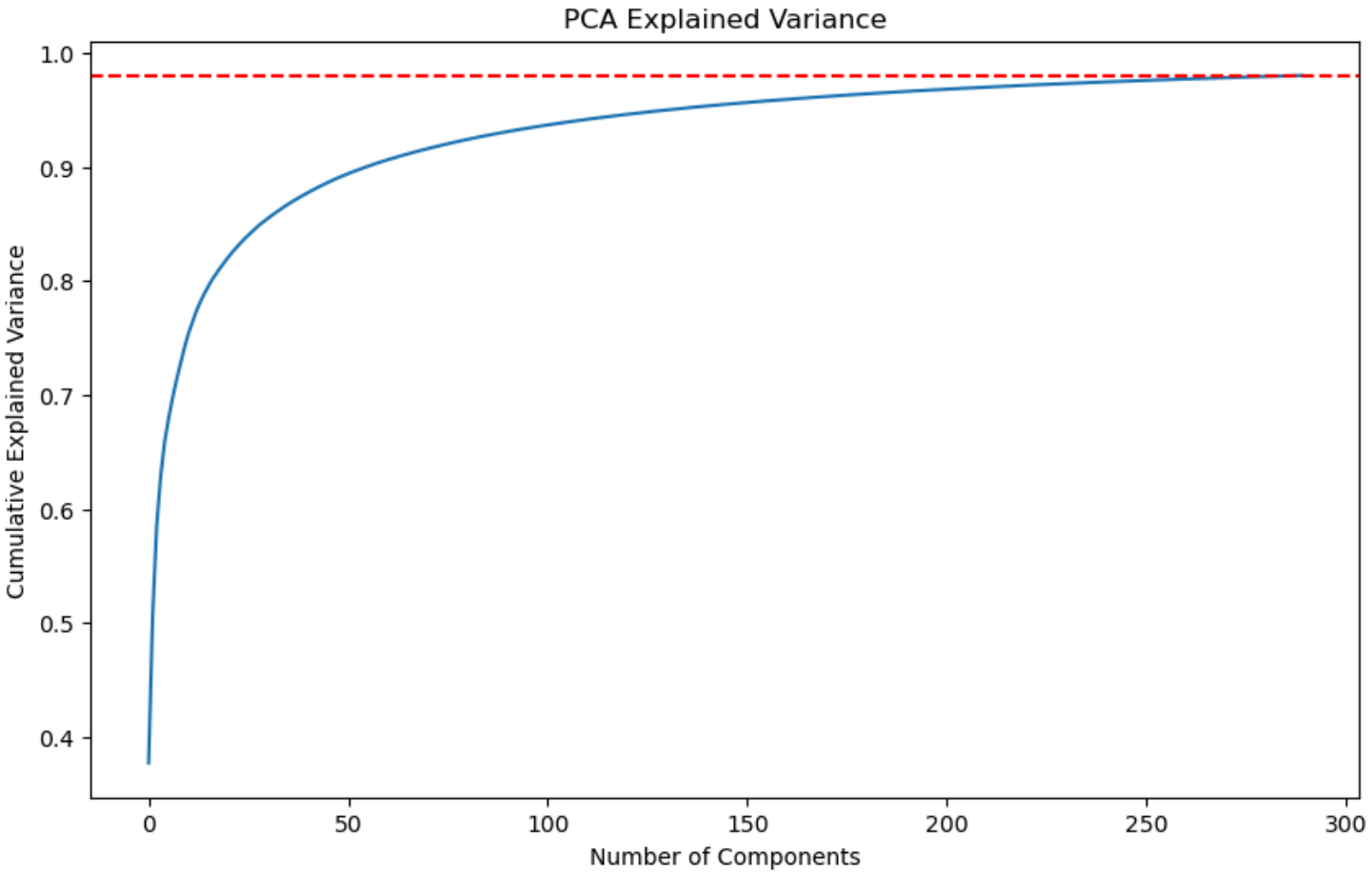
    -

PCA Analysis



Cumulative explained variance ratio by PCA components

Model Comparison

Model Architectures

1. **K-Nearest Neighbors (KNN)**
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        -
2. **Logistic Regression**
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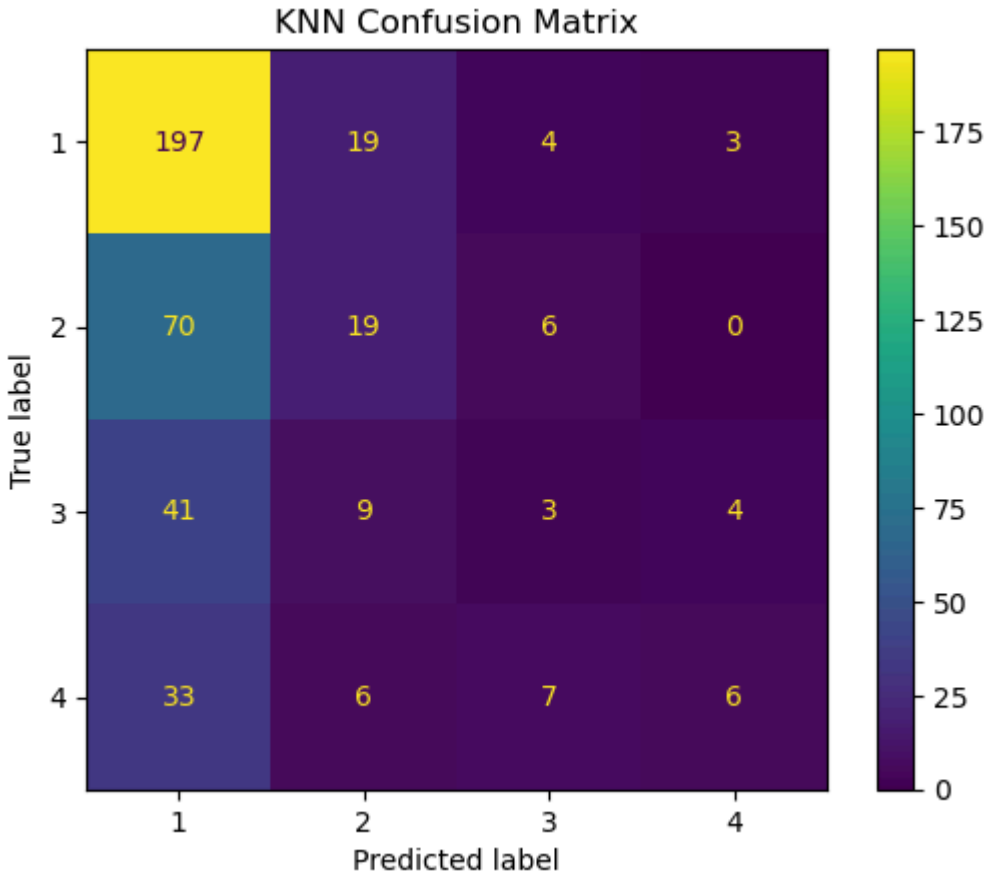
Performance Metrics

Metric	KNN	Logistic Regression

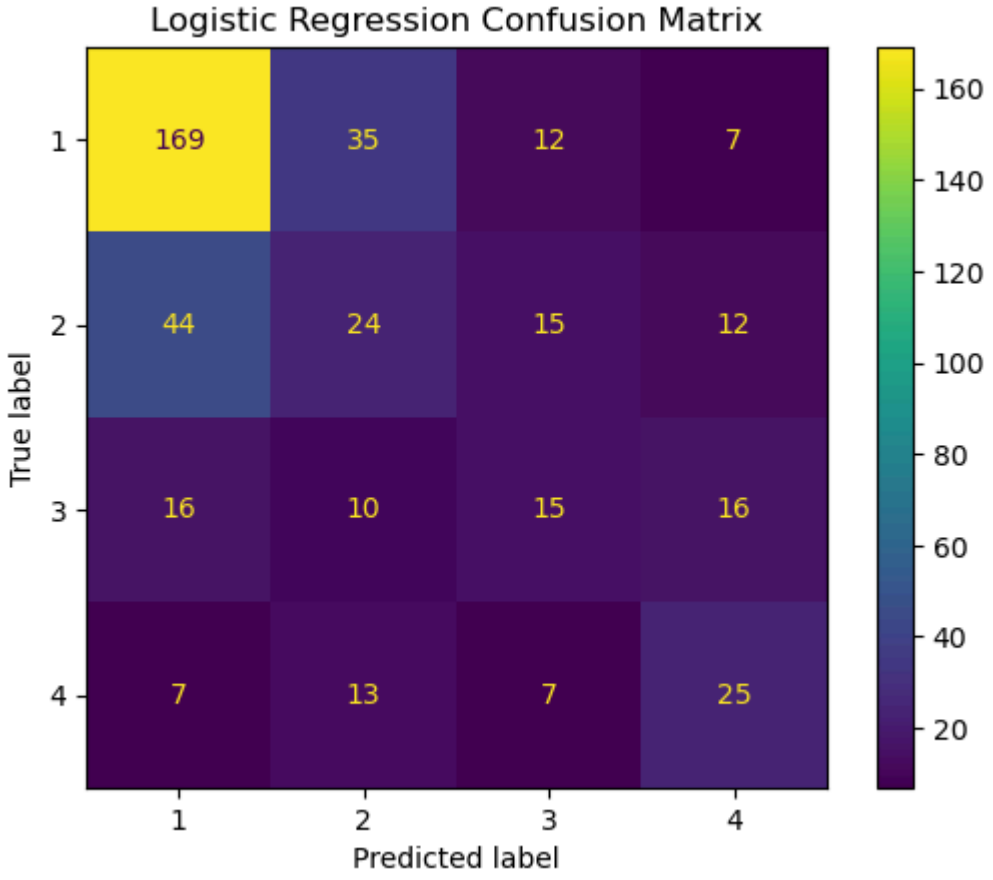
Confusion Matrices

KNN Model



Confusion matrix for KNN classifier

Logistic Regression Model



Confusion matrix for Logistic Regression classifier

Results and Analysis

Key Findings

1. **Model Performance**
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   -
2. **Feature Importance**
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   -
3. **Class Balance**
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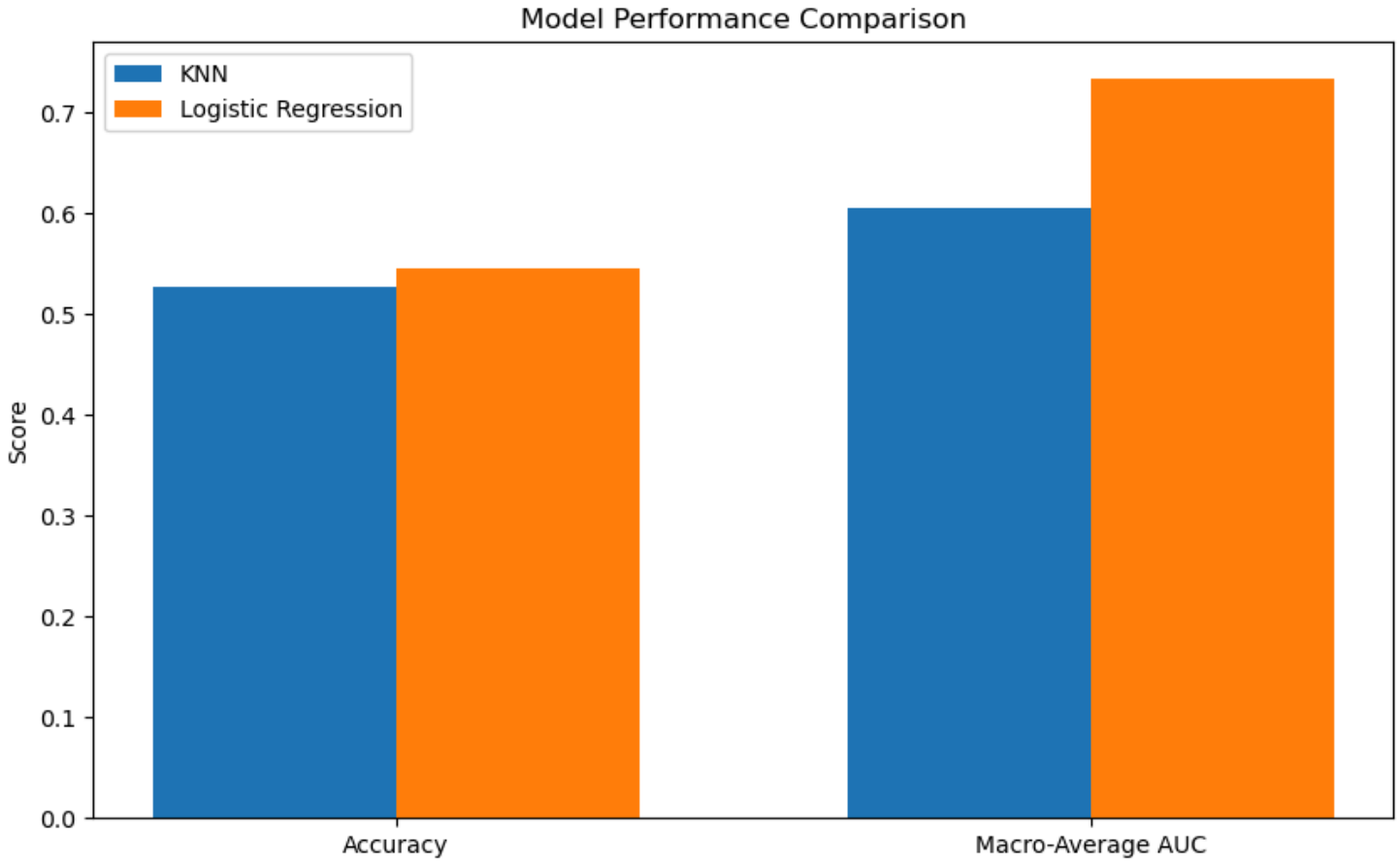
   -

Comparison Visualization



Performance comparison between KNN and Logistic Regression

Improvements Made

1. **Data Enhancement**
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   -
2. **Model Optimization**
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   -

-

3. **Results Visualization**
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    -
    -

Future Improvements

1. **Model Enhancements**
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    -
    -
2. **Feature Engineering**
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    -
    -
3. **Evaluation**
    -
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