**Statistical Methods in AI**
**Assignment 4 (Mini-Project)**

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## Age Prediction using EfficientNet and MSE Loss

### Introduction:

This code implements a deep learning model for predicting the age of individuals based on images using the EfficientNet architecture. It utilizes Mean Squared Error (MSE) loss function for optimization.

### Components:

1. **Dataset Class (AgeDataset):**
    - Manages loading of image data and corresponding age labels.
    - Performs data augmentation and preprocessing.
2. **Data Loading:**
    - Loads the training and test datasets using DataLoader.
3. **Model Architecture:**
    - Utilizes EfficientNet as the backbone architecture for feature extraction.
    - Fine-tunes the pretrained EfficientNet model for age prediction.
4. **Training Loop:**
    - Iterates through the training dataset for a specified number of epochs.
    - Computes MSE loss between predicted and actual age labels.
    - Updates model parameters using backpropagation and optimizer.
5. **Prediction:**
    - Generates predictions for age labels on the test dataset.
    - Utilizes the trained model to predict age labels.
6. **Evaluation:**
    - Evaluates the model's performance by calculating the loss on the training dataset after each epoch.

**Conclusion:** This code serves as a foundation for age prediction using deep learning techniques. It implements key components such as data loading, model

training, and prediction, utilizing EfficientNet architecture and MSE loss function for optimization.