

CS 4342 - Machine Learning
Homework - 2 Linear Regression

Method 1: Analytical Method

Training fMSE = 39.242962

Testing fMSE = 206.7964

Method 2: Gradient Descent Method

Training fMSE = 95.2860

Testing fMSE = 105.4207

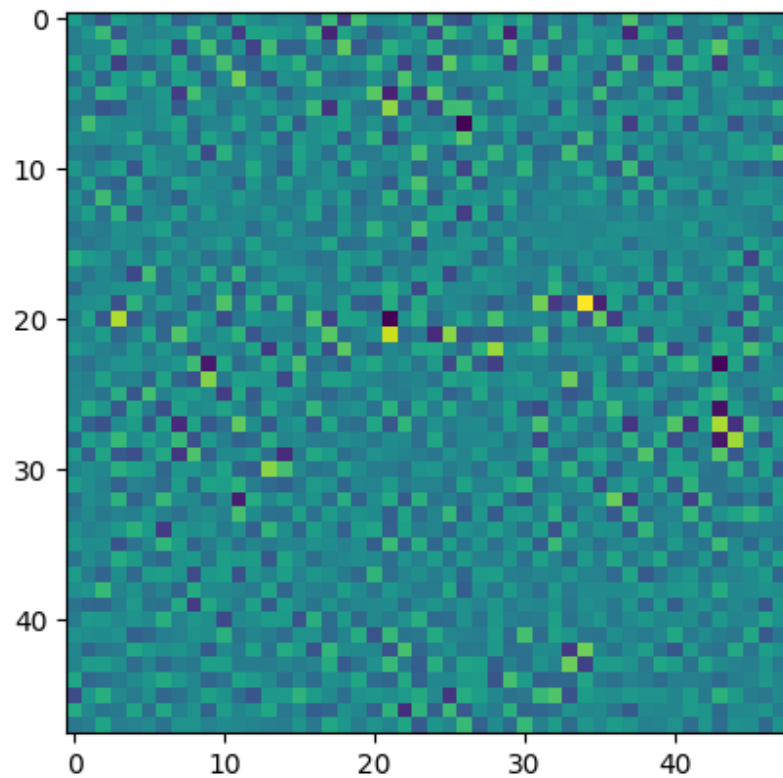
Method 3: Gradient Descent Method with L2 Regularization

Training fMSE = 95.2871

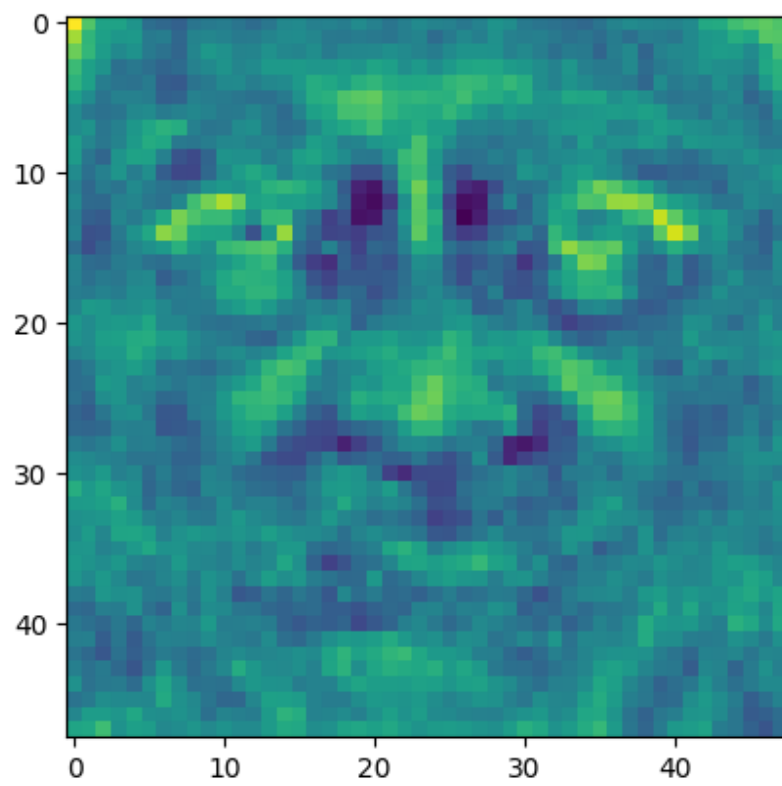
Testing fMSE = 105.4157

Learned Weights

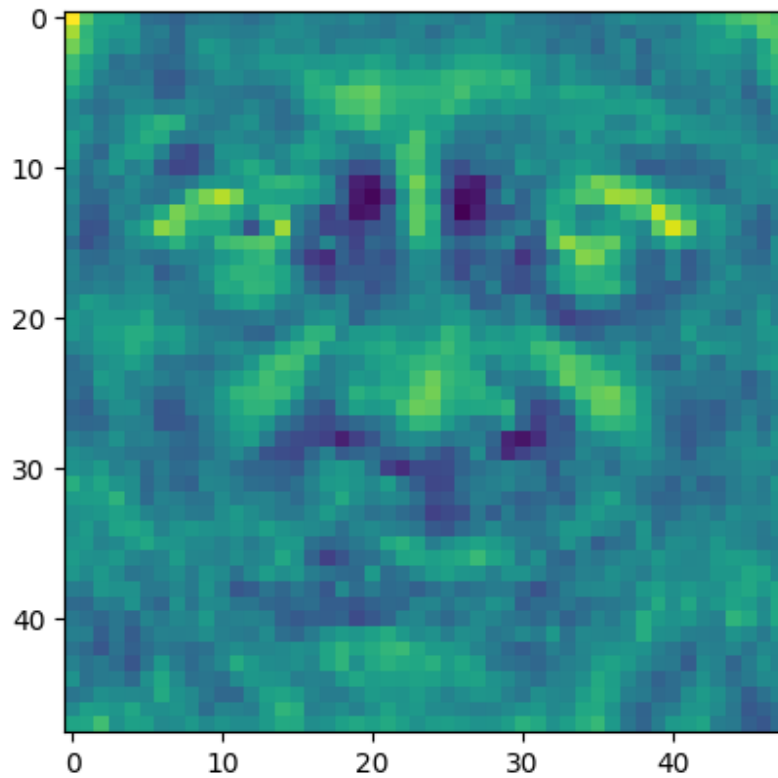
1. W1



2. W2



3. W3:



The first weight, W_1 , is totally different from W_2 and W_3 . It doesn't appear to be an image of a face. On the other hand, W_2 and W_3 appear similar and more like an image of an old person (specifically an old man). These two weights contain the aging features such as wrinkles, depression above the eye socket and white hair.

Top 5 most egregious predictions

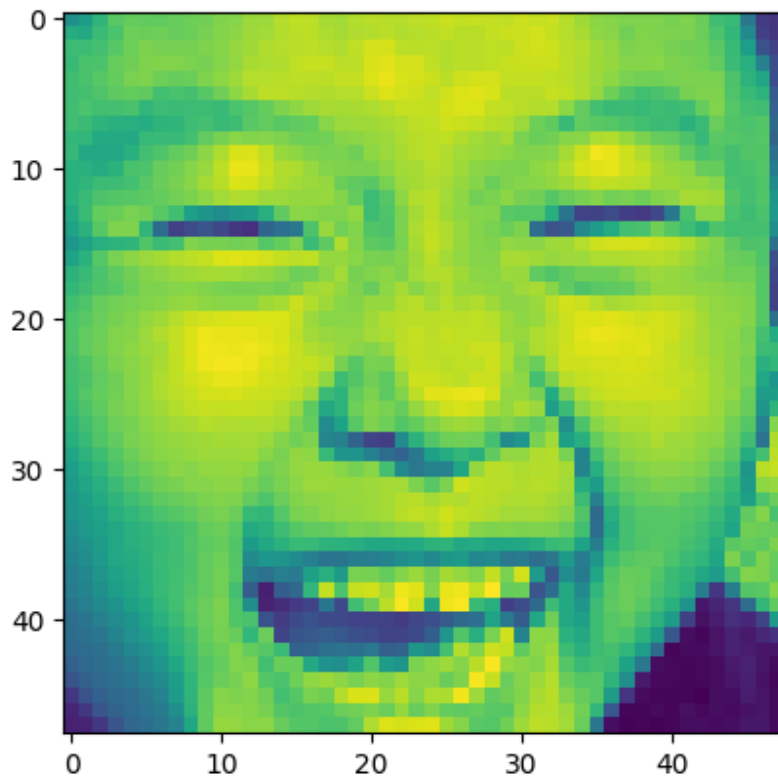


Image 1

Actual Age: 4

Predicted Age: 56.16

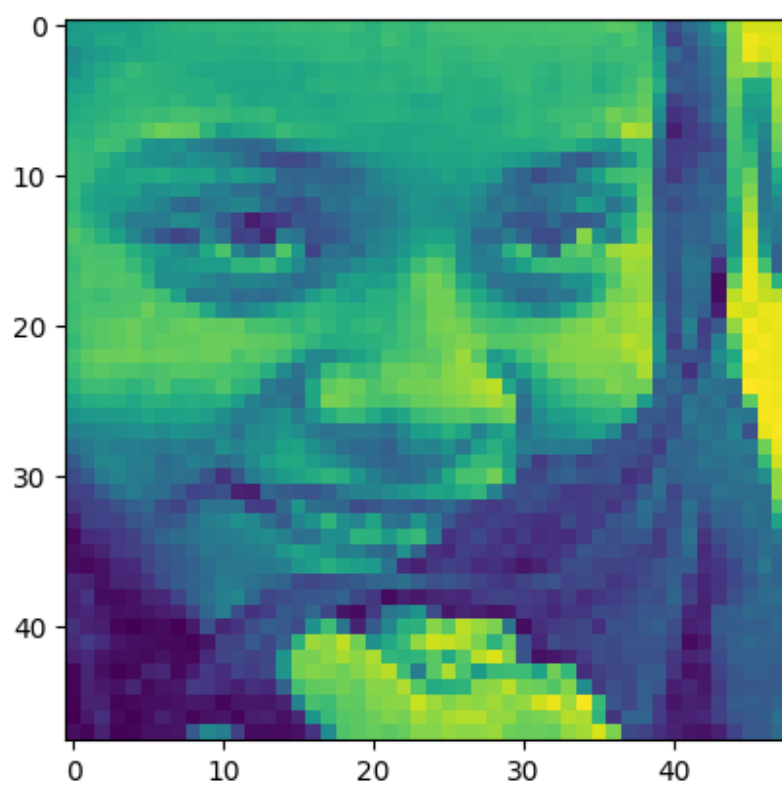


Image 2
Actual Age:10
Predicted Age: 59.7

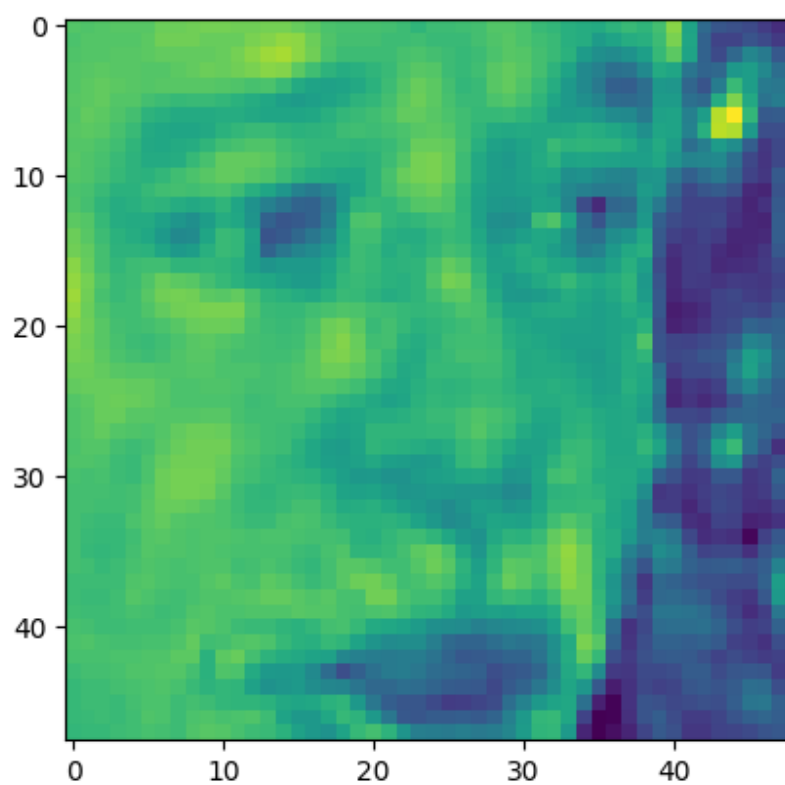


Image 3
Actual Age: 72
Predicted Age: 22.72

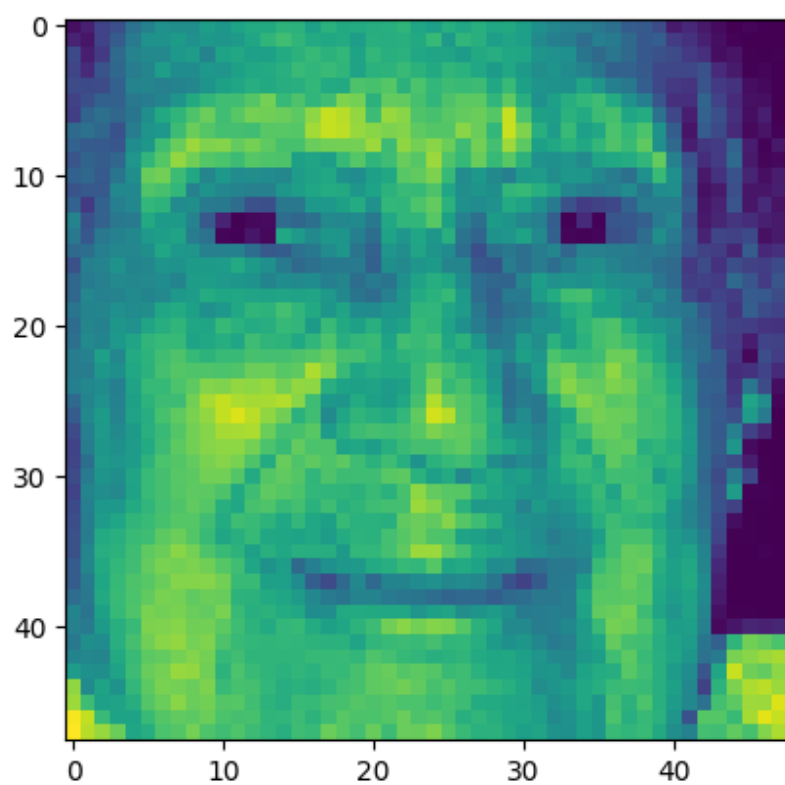


Image 4
Actual Age: 80
Predicted Age:30.78

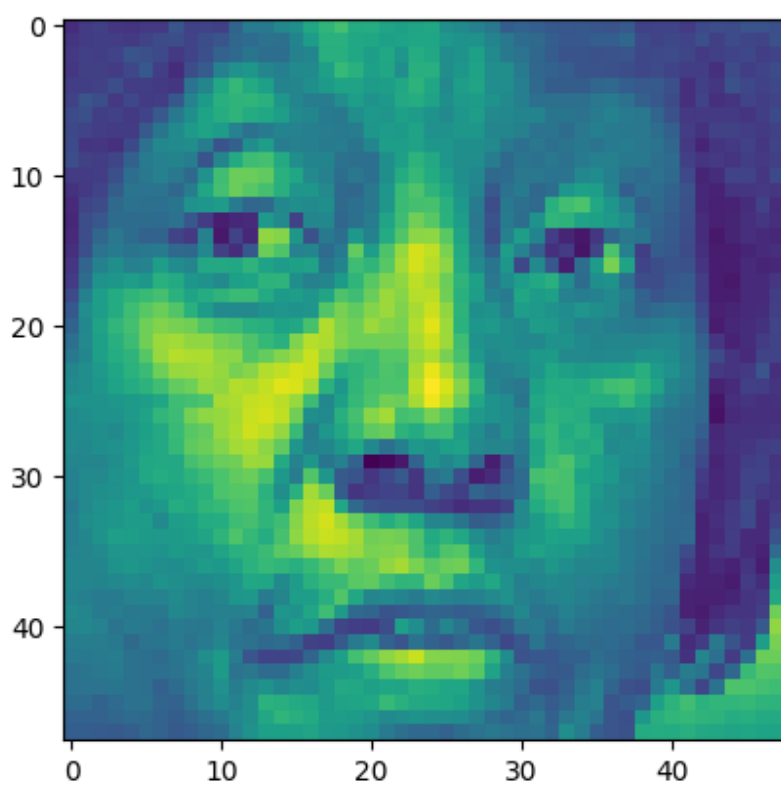


Image 5

Actual Age: 89

Predicted Age: 40.14