CS 4342 - Machine Learning
Homework - 2 Linear Regression

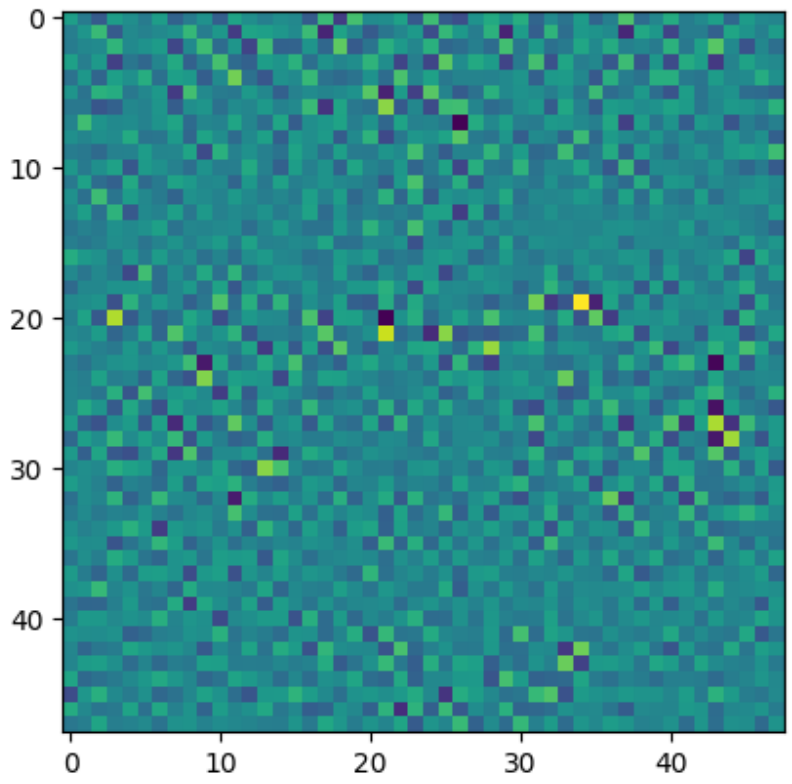
Method 1: Analytical Method
Training MSE = 39.242962
Testing MSE = 206.7964

Method 2: Gradient Descent Method
Training MSE = 95.2860
Testing MSE = 105.4207

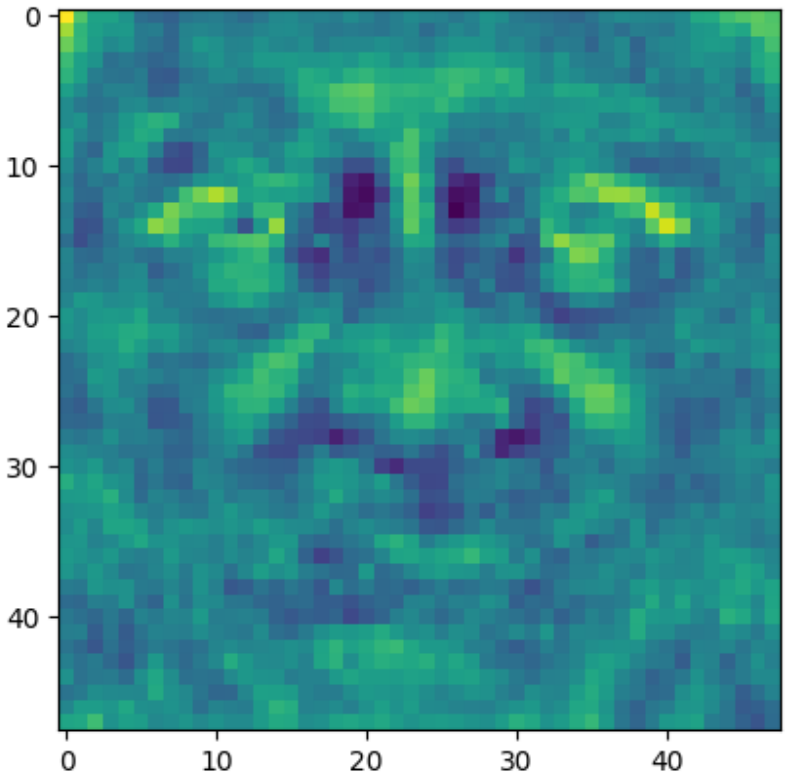
Method 3: Gradient Descent Method with L2 Regularization
Training MSE = 95.2871
Testing MSE = 105.4157
Testing RMSE = 10.26722

Learned Weights

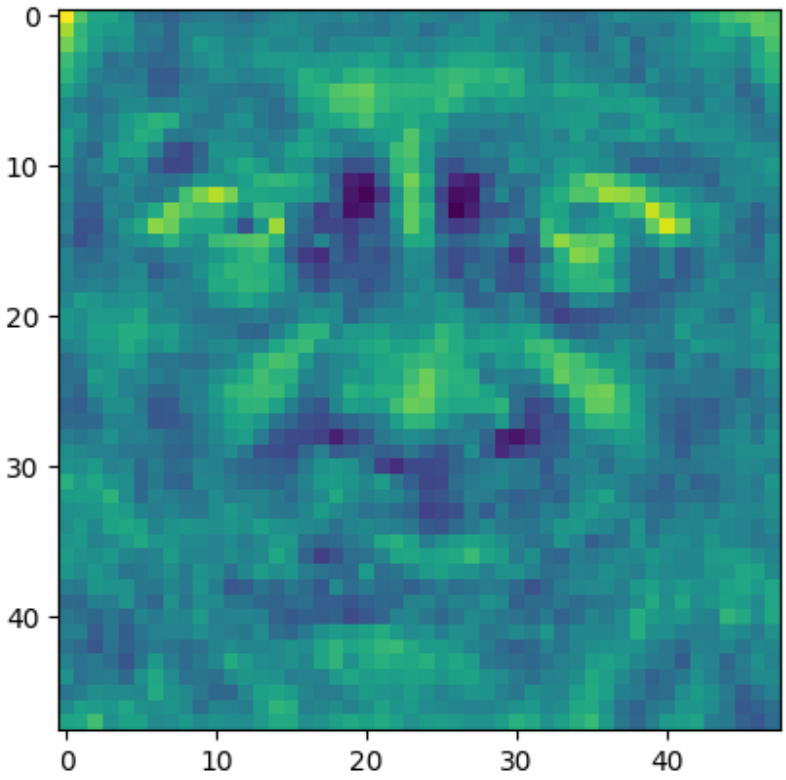
1. W1



2. W2



3. W3:



The first weight, W1, is totally different from W2 and W3. It doesn't appear to be an image of a face. On the other hand, W2 and W3 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

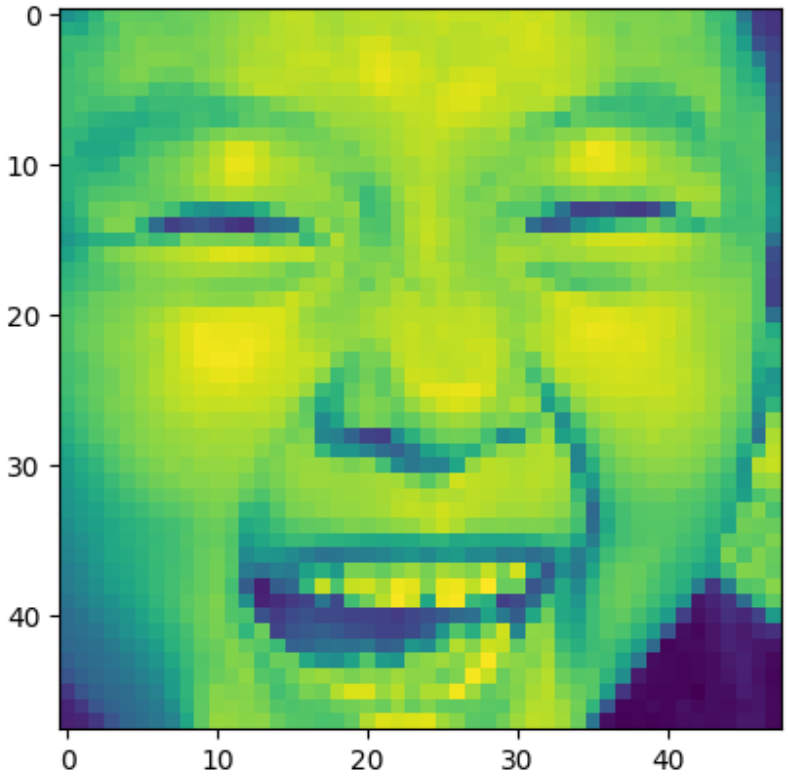


Image 1
Actual Age: 4
Predicted Age: 56.16

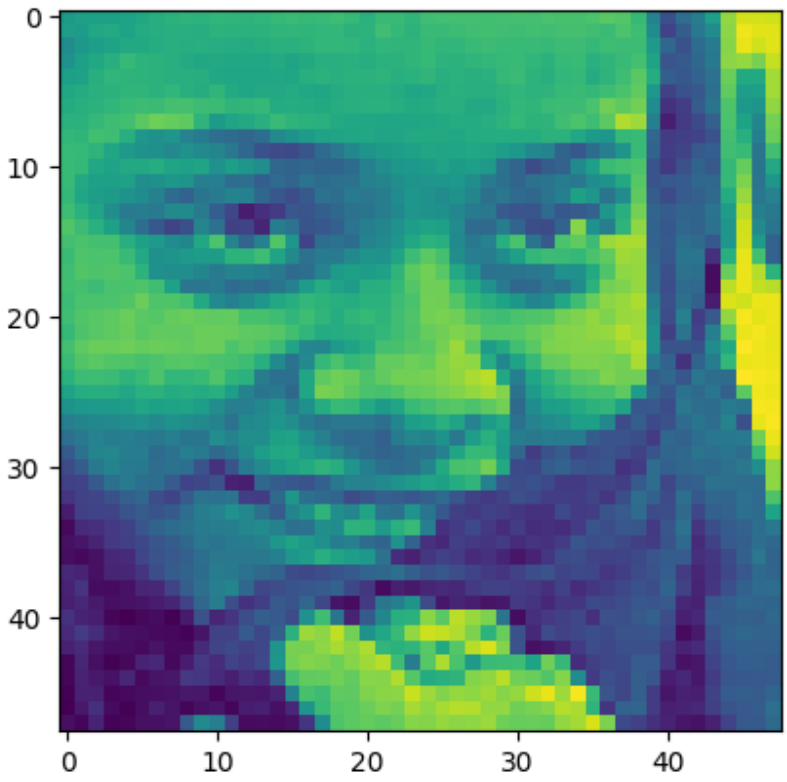


Image 2
Actual Age:10
Predicted Age: 59.7

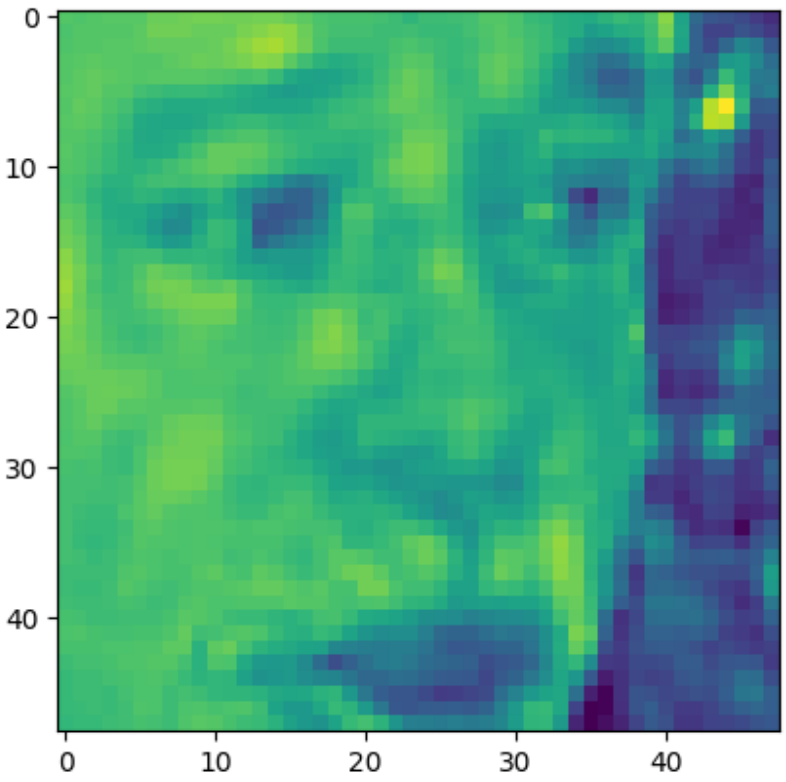


Image 3
Actual Age: 72
Predicted Age: 22.72

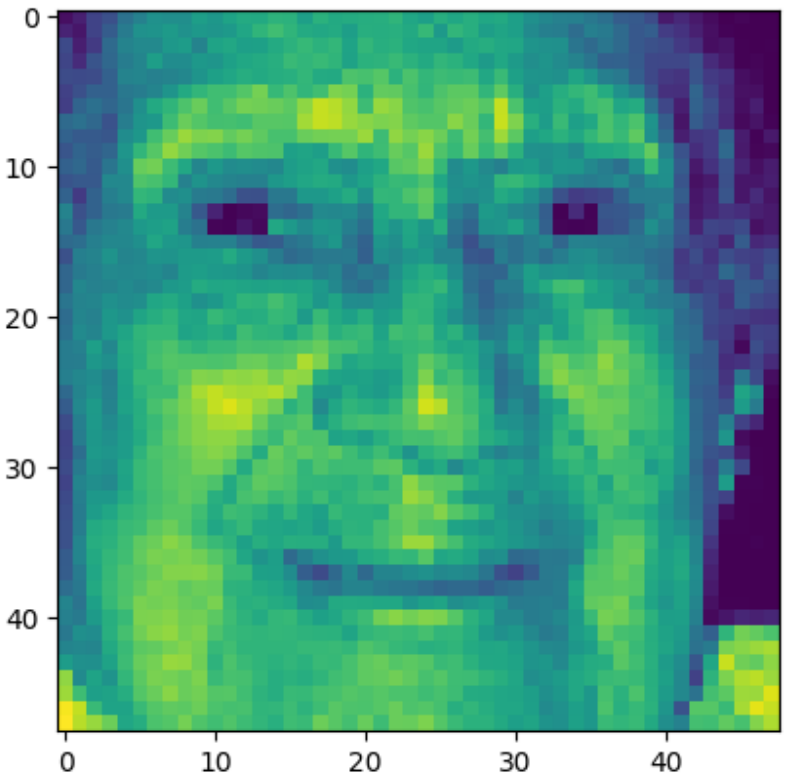


Image 4
Actual Age: 80
Predicted Age:30.78

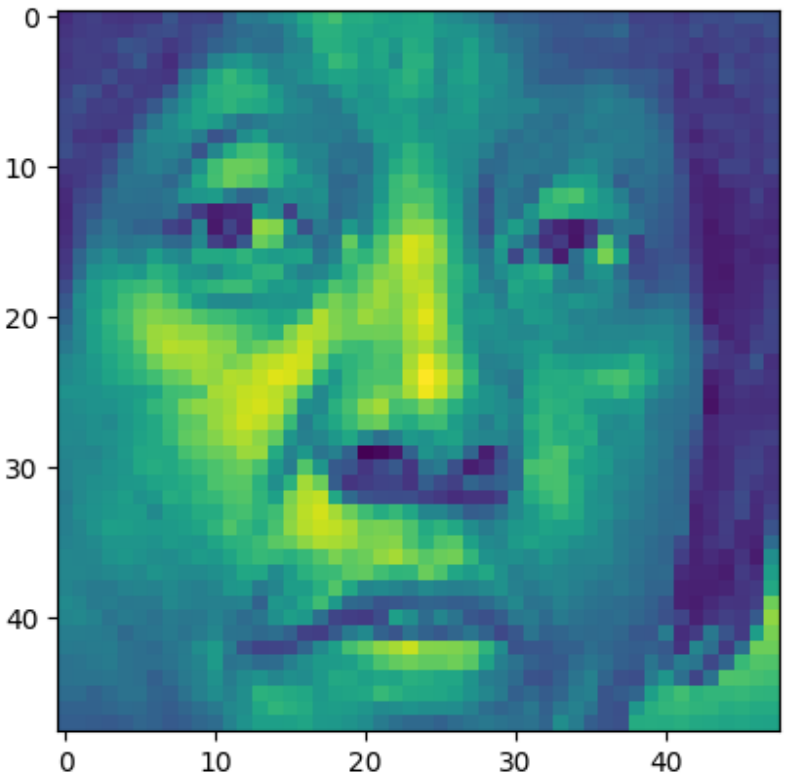


Image 5
Actual Age: 89
Predicted Age: 40.14