CS 4342 - Machine Learning
Homework - 2 Linear Regression

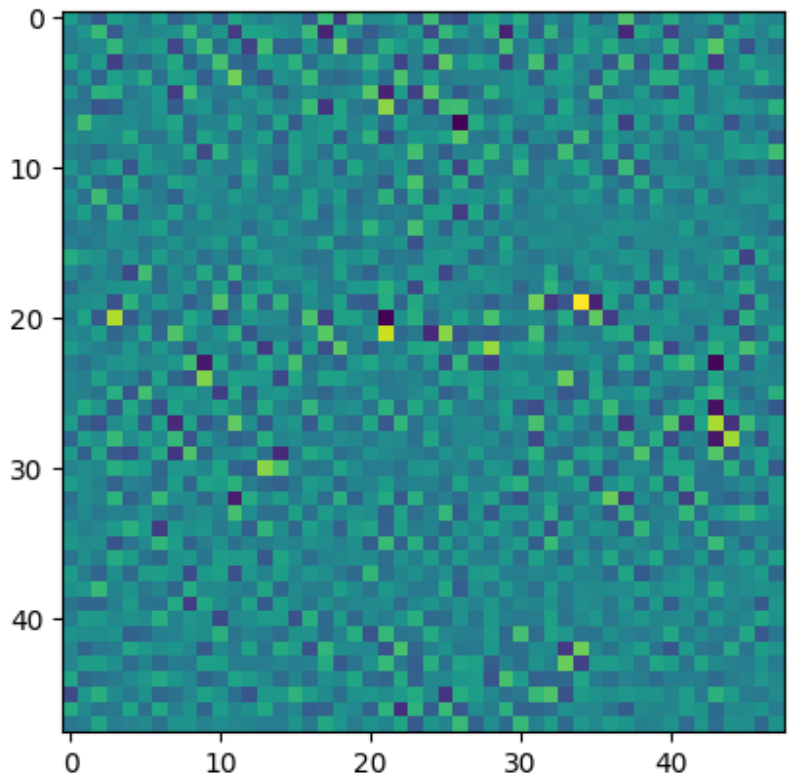
Method 1: Analytical Method
Training half-MSE = 39.242962
Testing half-MSE = 206.7964

Method 2: Gradient Descent Method
Training half-MSE = 83.555
Testing half-MSE = 93.085

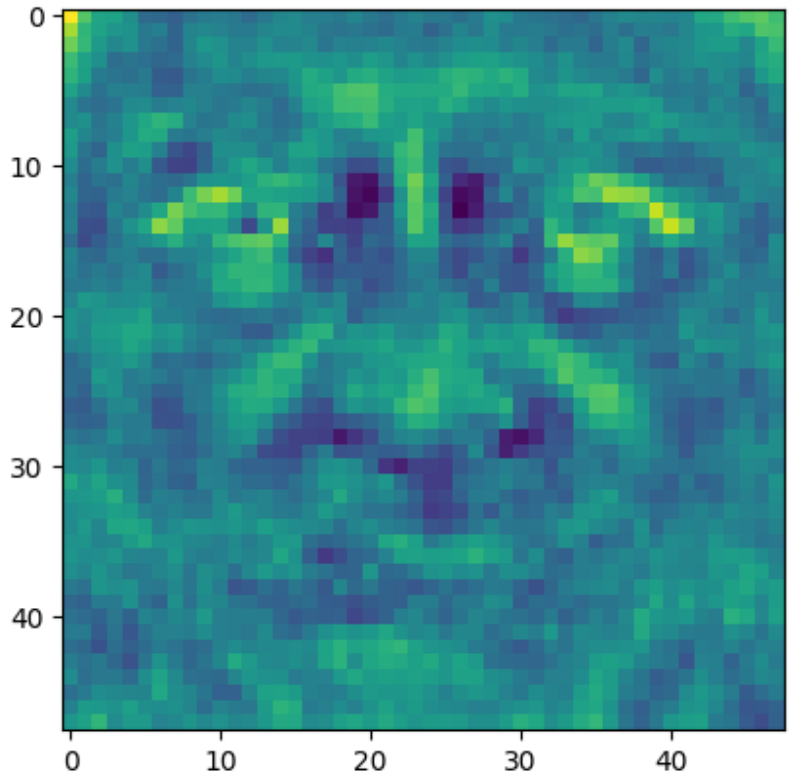
Method 3: Gradient Descent Method with L2 Regularization
Training half-MSE = 83.549
Testing half-MSE = 93.101
Testing half-RMSE = 9.6488

Learned Weights

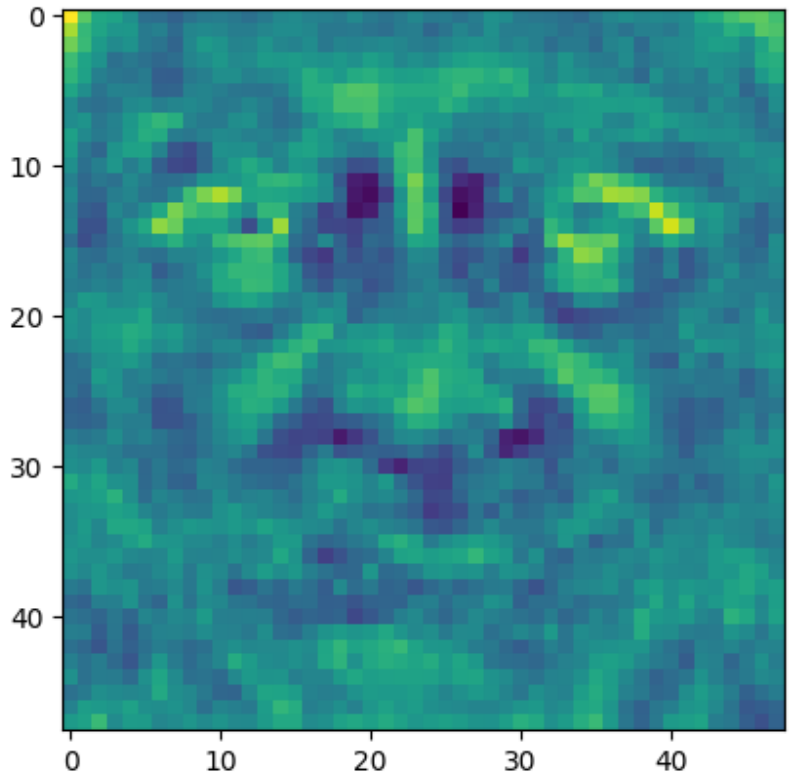
1. W1



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

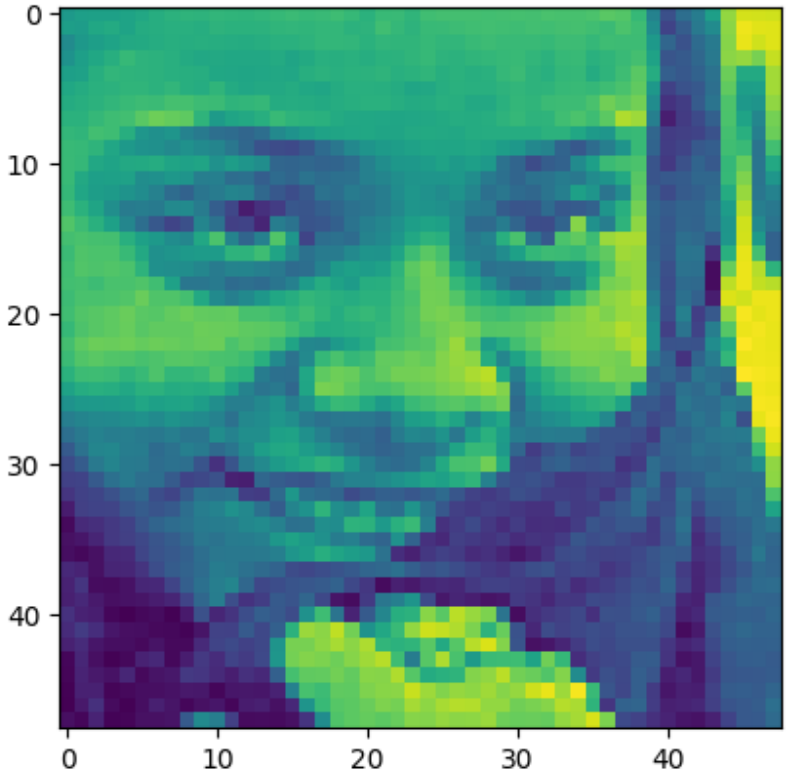


Image 1
Actual Age:10
Predicted Age: 60.03

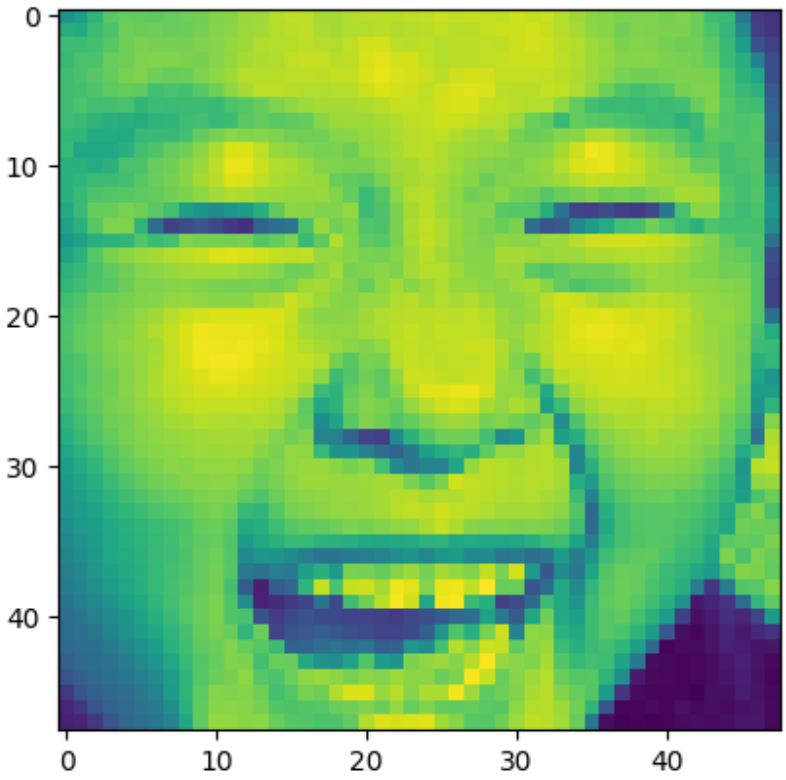


Image 2
Actual Age:4
Predicted Age: 52.408

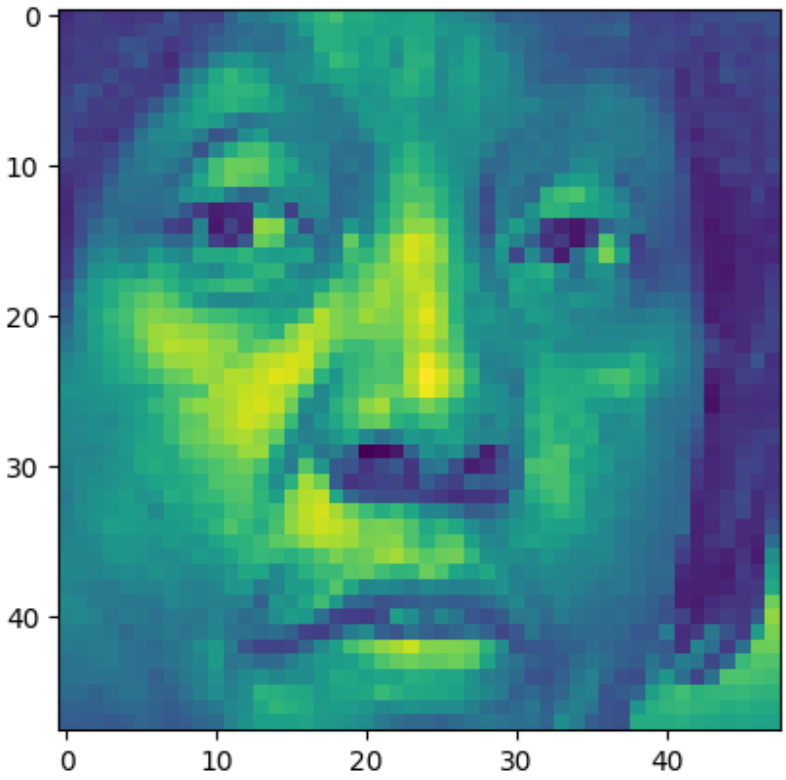


Image 3
Actual Age: 89
Predicted Age: 41.65083

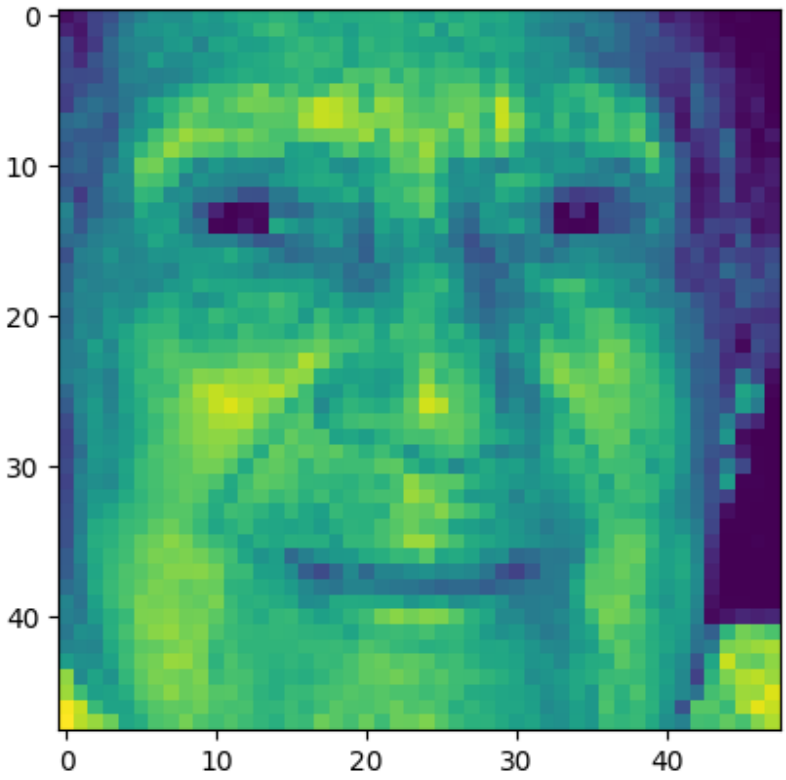


Image 4
Actual Age: 80
Predicted Age:33.3186

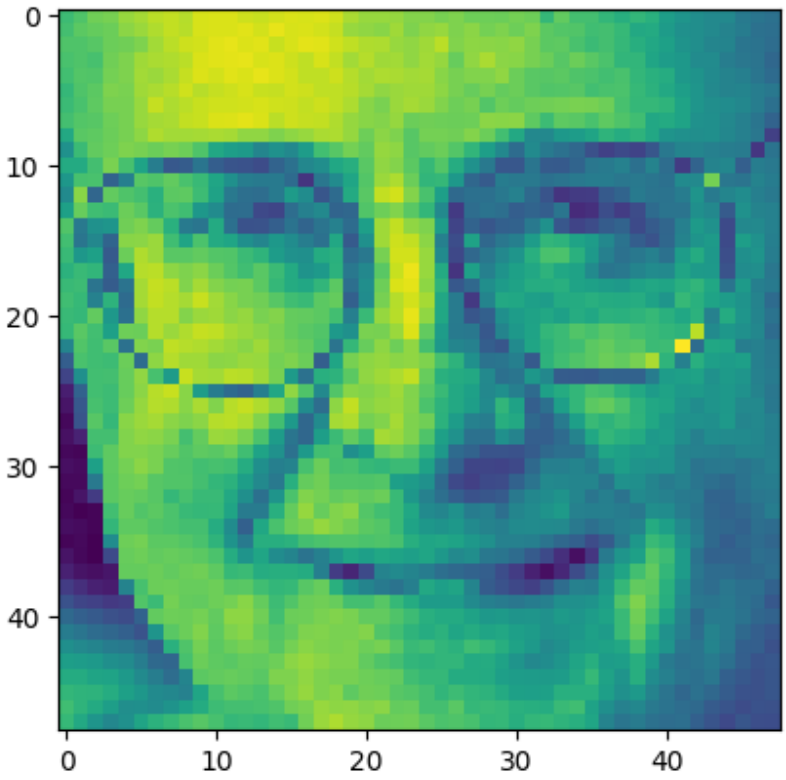


Image 5
Actual Age: 8
Predicted Age: 53.5575