HW 2

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Problem 1

Part (α)

The optimization problem is

Implement the following algorithms to obtain estimates of the regression coefficients β:

(1) Gradient descent with backtracking line search

(2) Gradient descent with backtracking line search and Nesterov momentum

(3) Gradient descent with AMSGrad-ADAM momentum

(no backtracking line search, since AMSGrad-ADAM adjusts step sizes per parameter using momentum and adaptive scaling)

(4) Stochastic gradient descent with a fixed schedule of decreasing step sizes

(5) Stochastic gradient descent with AMSGrad-ADAM-W momentum

Part (a)

Part (b)