Algorithm 1 Ridge Regression

Require: Dataset D, regularization parameter λ
Ensure: Ridge regression model parameters β

Initialize parameters β to 0
Set learning rate α and regularization parameter λ
while not converged **do**
    Compute predicted values $\hat{y} = X\beta$
    Compute residuals $e = y - \hat{y}$
    Compute gradient $\nabla_\beta = -2X^T e + 2\lambda\beta$
    Update parameters $\beta \leftarrow \beta - \alpha\nabla_\beta$
end while
return β