Lab5-Regression

CIS694/EEC693/CIS593 Deep Learning

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**Let us fill the code in the corresponding Python files. No need to modify the existing code.**

1. Please fill the code “LR\_SingleVariable.py” for linear regression with one single variable:

y = theta0 + theta1\*x

Suppose the ground-truth data has been generated with some random noise as detailed in the Python file. After filling the code, if you run it, you will see the following output in the command window with the following figure:

Epoch:0, Loss:77783.24273369457

Epoch:1, Loss:72171.13316214646

Epoch:2, Loss:66964.03053486267

Epoch:3, Loss:62132.70687209375

Epoch:4, Loss:57650.04347841819

Epoch:5, Loss:53490.87872283475

Epoch:6, Loss:49631.86680405037

…

Epoch:95, Loss:80.39290237406838

Epoch:96, Loss:75.83488737865326

Epoch:97, Loss:71.60580887519453

Epoch:98, Loss:67.68192863089944

Epoch:99, Loss:64.04122152085355

Ground-truth theta\_0:9.5

Ground-truth theta\_1:3.5

Predicted theta\_0:9.907032819622895

Predicted theta\_1:3.391846602561324

A picture containing chart

Description automatically generated

2. Please fill the code “QR\_SingleVariable.py” for quadratic regression with one single variable:

y = theta0 + theta1\*x + theta2\*(x2)

Suppose the ground-truth data has been generated with some random noise as detailed in the Python file. After filling the code, if you run it, you will see the following output in the command window with the following figure:

Epoch:0, Loss:920660270.3101265

Epoch:1, Loss:555311053.3307267

Epoch:2, Loss:334945512.60576975

Epoch:3, Loss:202028924.0836065

Epoch:4, Loss:121858406.28423025

…

Epoch:94, Loss:4552.011621541269

Epoch:95, Loss:4551.991766856051

Epoch:96, Loss:4551.97191225774

Epoch:97, Loss:4551.952057746326

Epoch:98, Loss:4551.932203321801

Epoch:99, Loss:4551.912348984179

Ground-truth theta\_0:9.5

Ground-truth theta\_1:3.5

Ground-truth theta\_2:1

Predicted theta\_0:9.998481006821175

Predicted theta\_1:9.886836608999175

Predicted theta\_2:0.9212991650423719

Shape

Description automatically generated