

Lab5-Regression

CIS694/EEEC693/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:

$$y = \text{theta0} + \text{theta1} * x$$

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

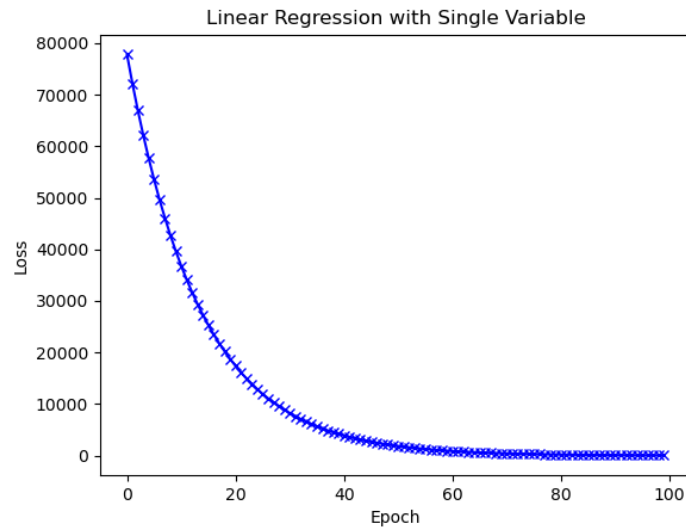
Epoch:99, Loss:64.04122152085355

Ground-truth theta_0:9.5

Ground-truth theta_1:3.5

Predicted theta_0:9.907032819622895

Predicted theta_1:3.391846602561324



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

$$y = \text{theta0} + \text{theta1} * x + \text{theta2} * (x^2)$$

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 θ_0 :9.5

Ground-truth θ_1 :3.5

Ground-truth θ_2 :1

Predicted θ_0 :9.998481006821175

Predicted θ_1 :9.886836608999175

Predicted θ_2 :0.9212991650423719

