

Assignment 1 Report

Linear Regression

The problem we are trying to solve here is finding a new house which is suitable to our needs and the budget we assigned. The client who wants to buy the new house did her research and found some houses. She wrote the details of each house she visited including location, sale condition, sale type, house price, among others. She needs some help to know how much she is expected to pay to get a house that conforms with her specific needs. Your task is to build a linear regression model that helps her to predict the house price depending on the given attributes she collected.

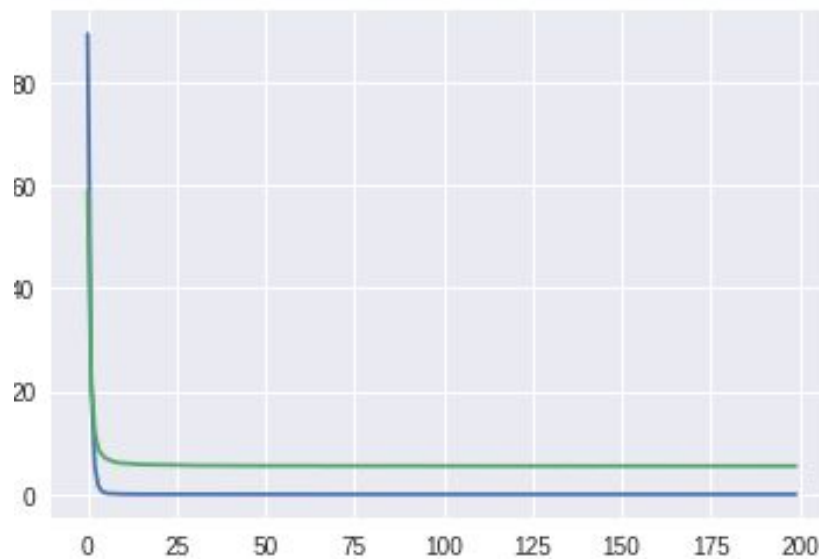
Model Information:

- Hyper-parameters:
 - Learning rate of SGD optimizer = 0.01
 - Momentum of SGD optimizer = 0.001
 - Epochs Number
- Input Number = 288 “After Changing from Categorical to Numerical”
- Output Number = 1

Tuning:

- After adding value to momentum the learning by SGD improved
- After adding artificial variable the validation_loss minimized.
- SGD optimizer worked well in this model

Training Loss & Validation Loss Plot vs Epochs:



Hint:

- Green curve: Validation loss
- Blue curve : training loss
- X-axis: epochs number
- Y-axis: loss value

Results:

loss: 0.0406 - val_loss: 8.4752

Logistic Regression:

Here, we are trying to increase the people's attention regarding the heart diseases. Like any disease, it is always better to know if you are sick early so you can get the treatment you need before it is too late. Therefore, we use a dataset that gathered some information about two groups: a group with a heart disease and the other group has no disease. The gathered information includes age, chest pain type, fasting blood sugar, etc. Your goal is to train a logistic regression model to predict if a person has a heart disease or not depending on the given information.

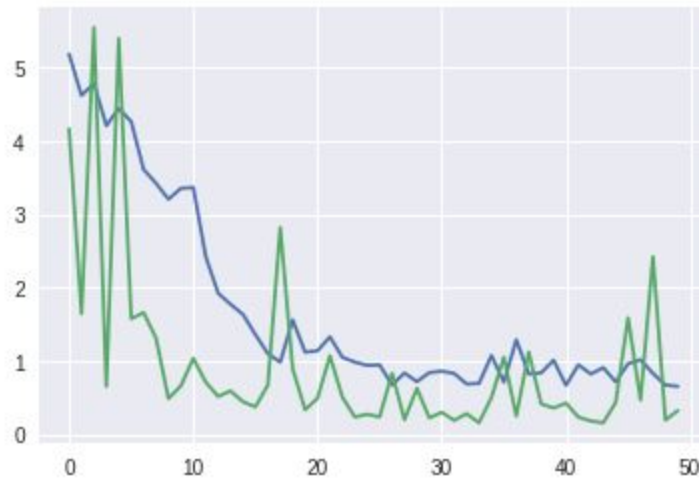
Model Information:

2. Hyper-parameters:
 - Learning rate of Adam optimizer = 0.01
 - beta_1 of Adam optimizer = 0.9
 - Beta_2 of Adam optimizer = 0.999
 - Amsgrad of Adam optimizer = True
 - Epochs Number = 50
2. Input Number = 13
3. Output Number = 1

Tuning:

- Making **learning rate** = 0.01 instead of default value 0.001 made a significant difference and gave a better accuracy.
- Setting **Amsgrad** to **True** value also improved the accuracy in a significant way.

Training Loss & Validation Loss Plot vs Epochs:



Hint:

- Green curve: Validation loss
- Blue curve : training loss
- X-axis: epochs number
- Y-axis: loss value

Results:

loss: 0.6536 - acc: 0.8088 - val_loss: 0.3236 - val_acc: 0.9130

Test fraction correct (NN-Score) = 0.84

Test fraction correct (NN-Accuracy) = 0.83