# ML Lab 03

## Setting iterations to 100

* The gradient descent does not fully converge to the optimal solution.
* The cost function J(θ) still be relatively high compared to the 1500-iteration case.
* The final value of Theta is not as close to the optimal values, meaning the model does not fit the data well.

Explanation - Since gradient descent is an iterative optimization process, a lower number of iterations means it stops before reaching the minimum of the cost function. This results in underfitting, where the algorithm has not learned the best parameters yet.

## Setting iterations to 10,000

* The cost function J(θ) decreases further and stabilizes.
* Theta values become more accurate, leading to a better fit for the data.
* However, after several iterations, the improvement in cost function becomes negligible.

Explanation - If the learning rate alpha is well-tuned, running more iterations allows gradient descent to reach a more optimal solution. However, excessive iterations can lead to unnecessary computation without significant improvement.