

## Report

!! Honestly, I am not sure that my code is working properly, because it seems like I miss a shift somewhere by y-axis. I do not know how to fix it and would appreciate an explanation in the feedback:) !!

- What happens if the learning rate is too high or too low?

When learning rate is too high, the gradient moves too fast during gradient descent. The fitting line then goes to minus infinity on y-axis. If the learning rate is too low, that would make convergence slow.

- Can Linear Regression really find the absolute global minimum?

Not necessarily. There is always a chance that the minimum found is not global, but local. A better initial guess for gradient descent should help, but we cannot be sure.

- What effect does it have if you change the initial guess for the gradient descent to something completely off?

If a guess is not a lucky guess, it would make the result worse. If a guess is a very lucky guess, it would make the fit much better.

- What happens if you are not updating  $\theta_0$  and  $\theta_1$  "simultaneously" but you are updating both parameters in separate for loops?

If we do not update thetas simultaneously, the change in one theta will influence the change in the other and thus they will be dependent on each other.