function for linear regression

as matrices

dimensions of those matrices in simple linear regression

coefficients

estimate for

prediction

error

or

note dimensions

remember the goal is to minimize the error:

or

or

note dimensions

we want to find the which minimizes the error, so we take the partial derivative with regard to and set it to

draw the transposition into the parentheses and remember to reverse the terms if you transpose a product

aus-x-en

note the dimensions of only this part of the derivative

so it is a scalar, and we actually have it two times

so the whole term looks like this now

now derive: terms with no disappear, terms with a loose the , terms with become

solve for b (the osl parameter estimates)

check the dimensions one last time

yay, checks out :)