# Linear Regression with Multiple Variables

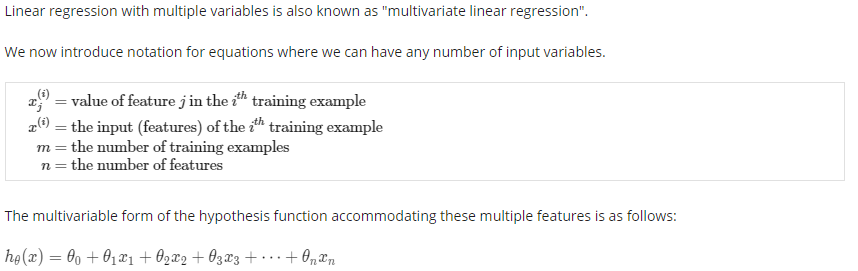
## ~~Environment Setup Instructions~~

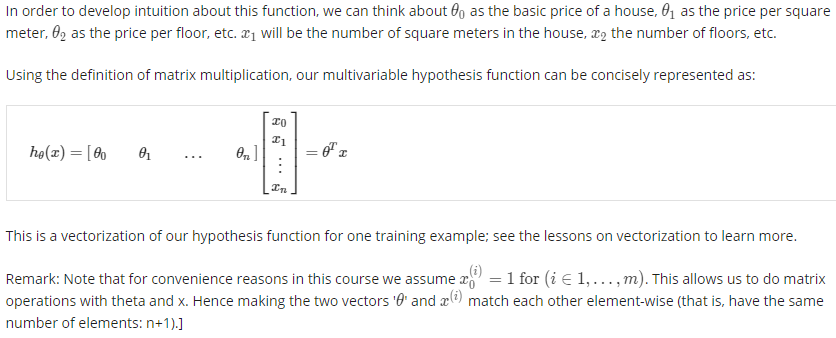
## Multivariate Linear Regression

Multiple Features

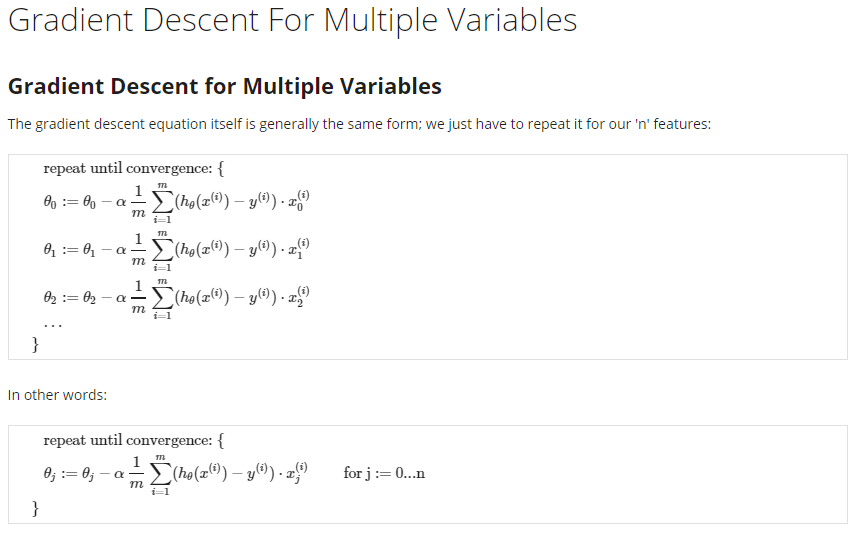
* … or variables

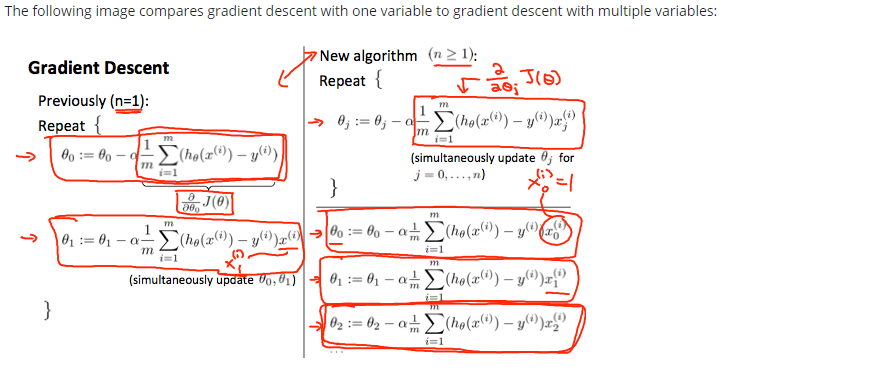






Gradient Descent for Multiple Variables

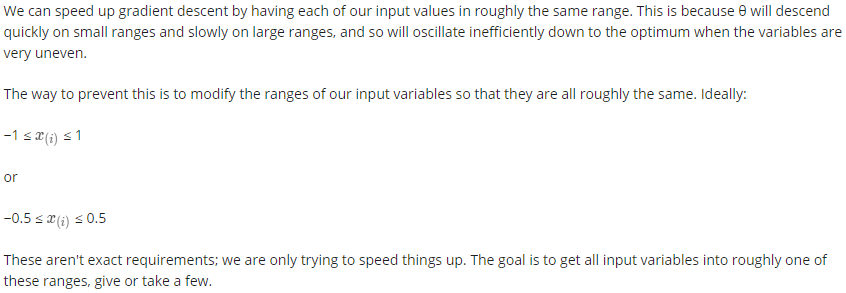


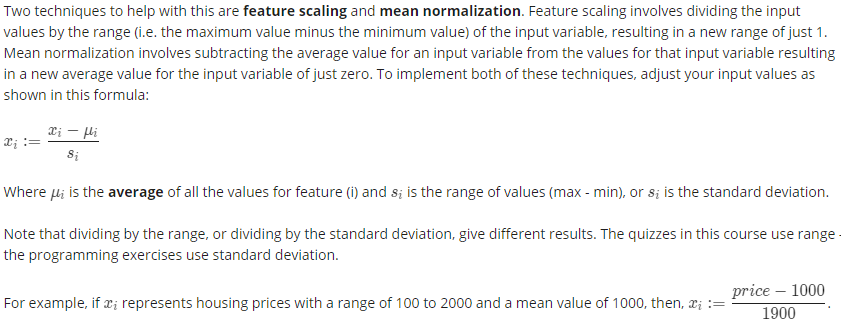


Gradient Descent in Practice I – Feature Scaling

* Feature scaling
* (-) 3 and (-) 1/3
* Mean normalization



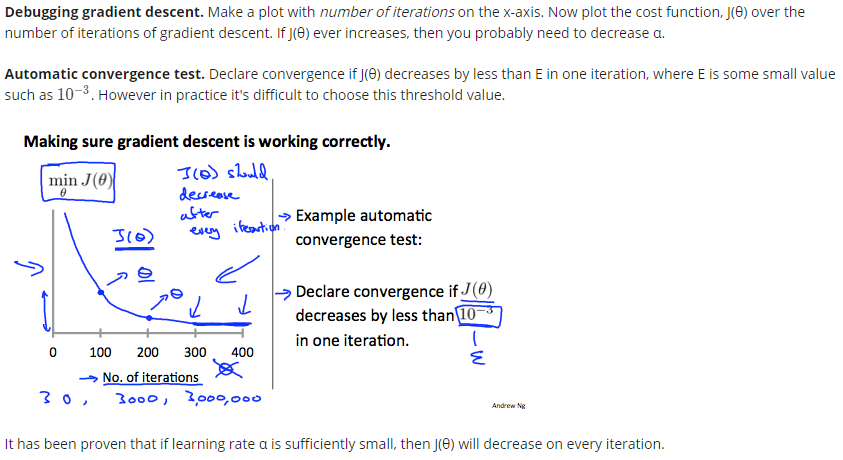


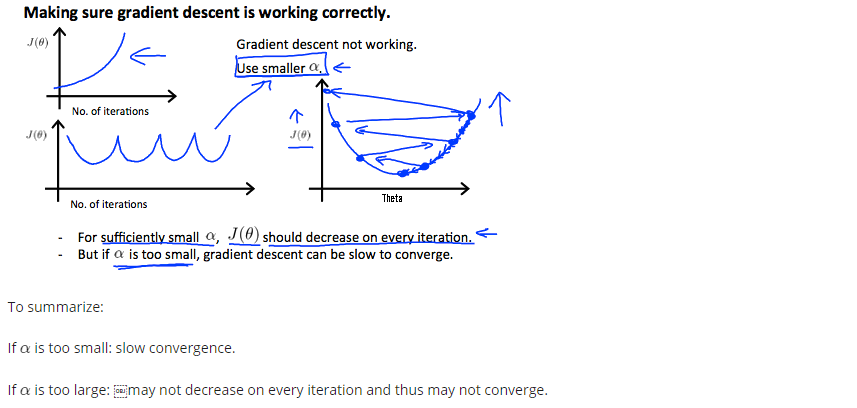


Gradient Descent in Practice II – Learning Rate

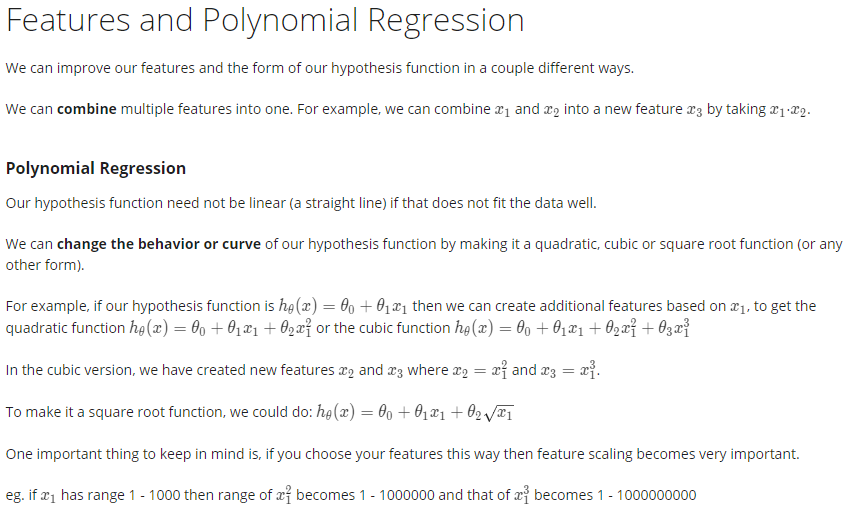
* Debugging
* Selection







Features and Polynomial Regression

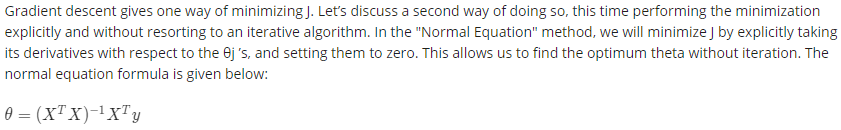


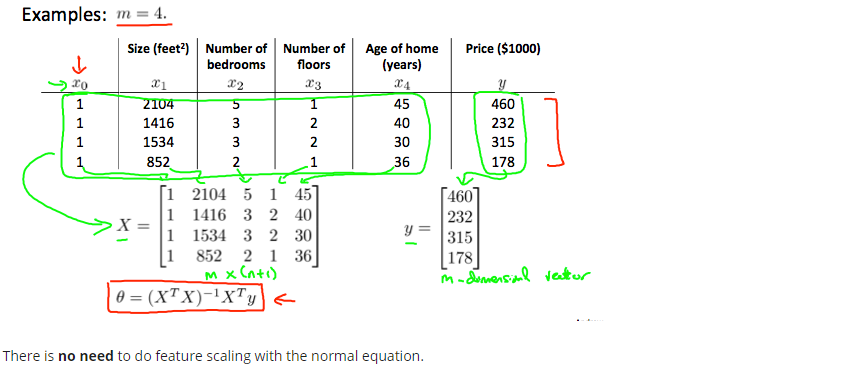
## Computing Parameters Analytically

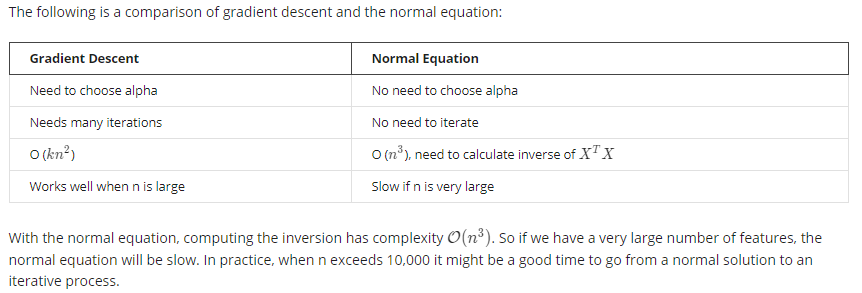
Normal Equation

* Analytical solution
* Classification (logistic regression) algorithms – example of complex algorithms



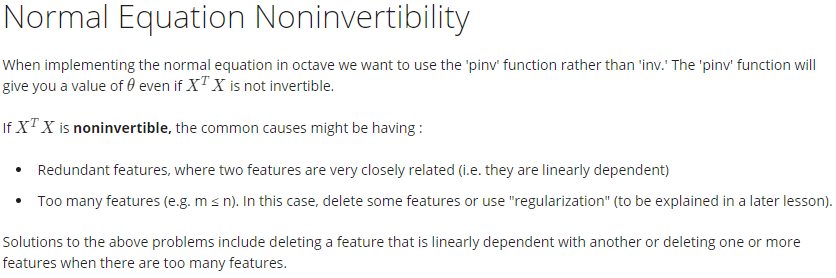






Normal Equation Noninvertibility

* Regularization

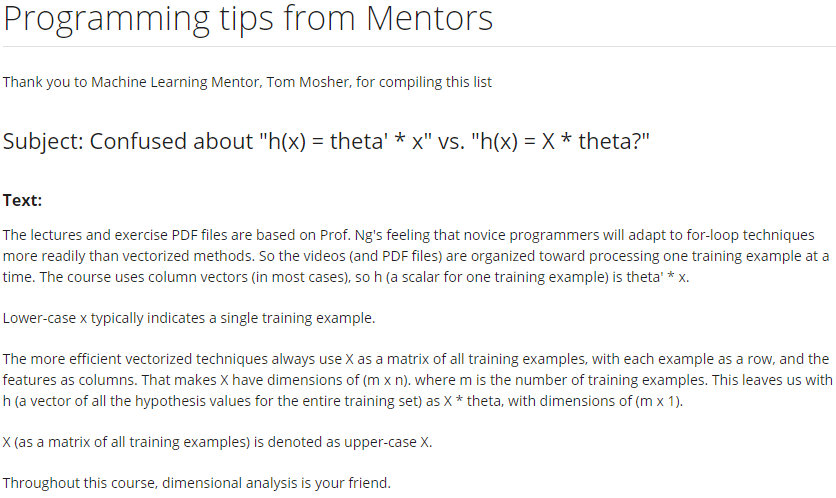


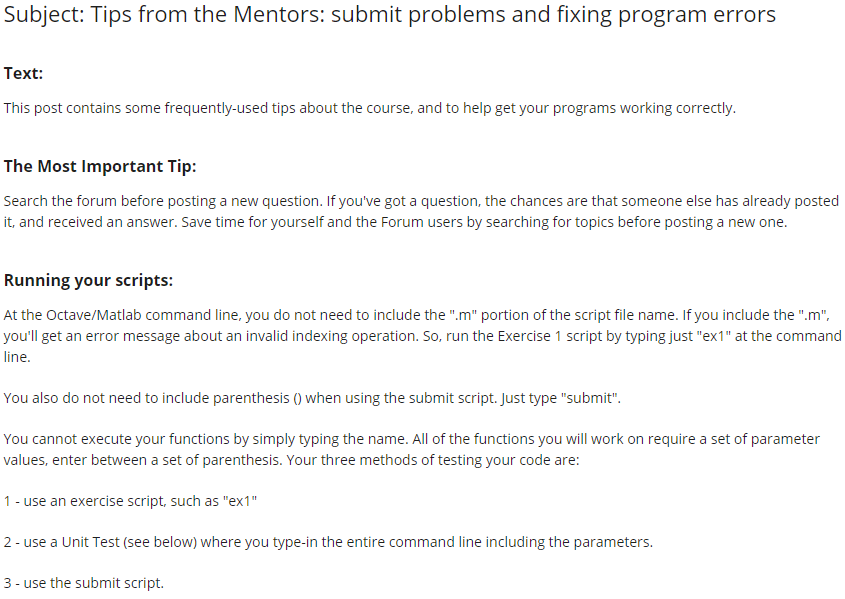
## Submitting Programming Assignments

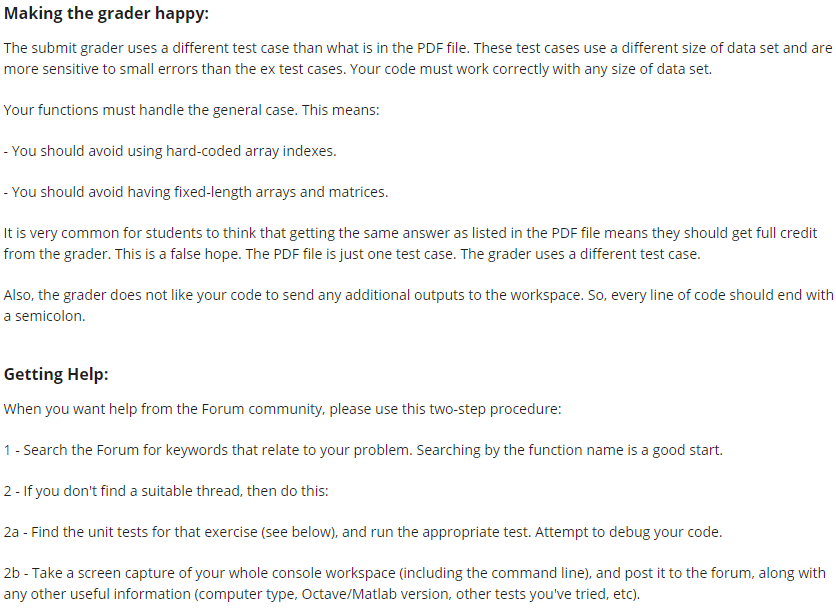
Working on and Submitting Programming Assignments

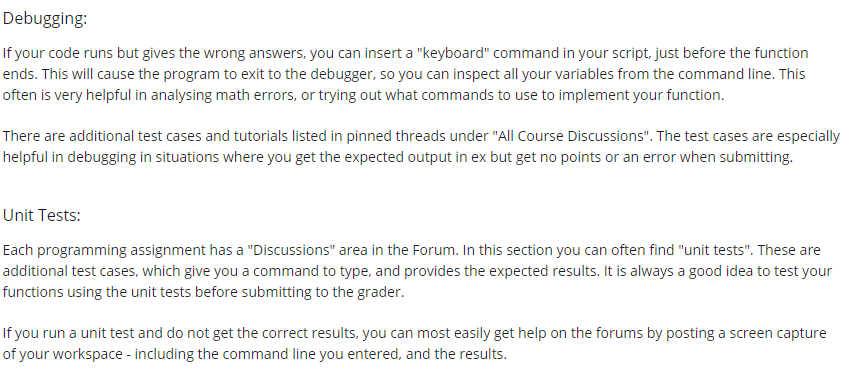
* Steps
* email address, submission password

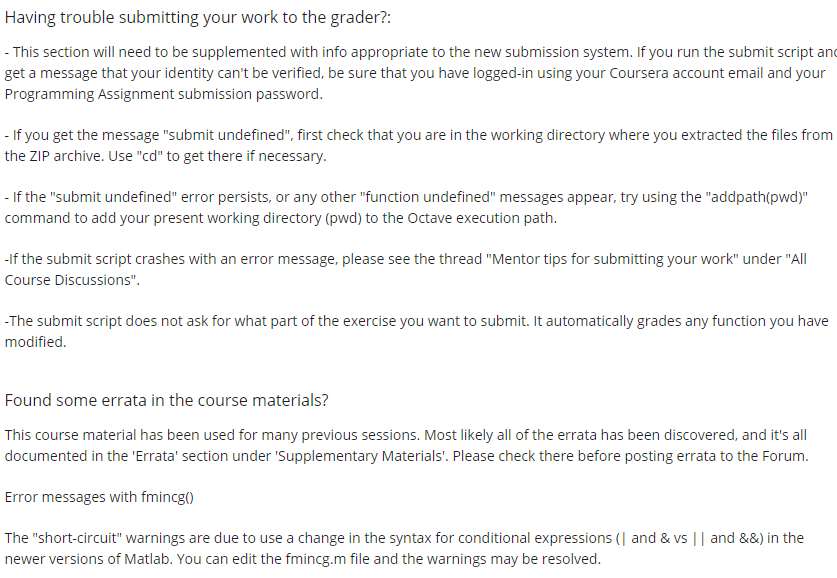
Programming Tips From Mentors

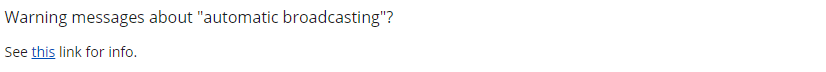




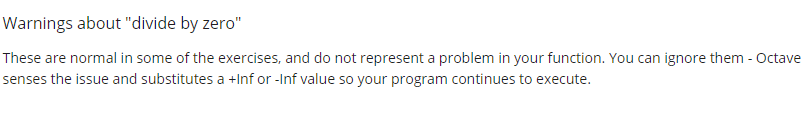








<https://octave.org/doc/v5.2.0/Broadcasting.html>



# Octave/MATLAB Tutorial