Lecture Notes for Machine Learning in Python

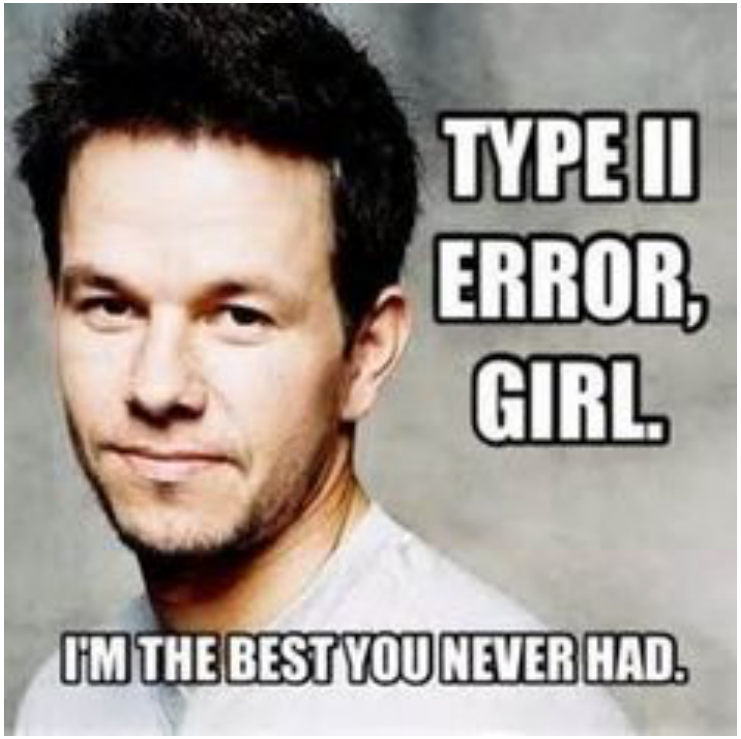
Professor Eric Larson

Logistic Regression

Class Logistics and Agenda

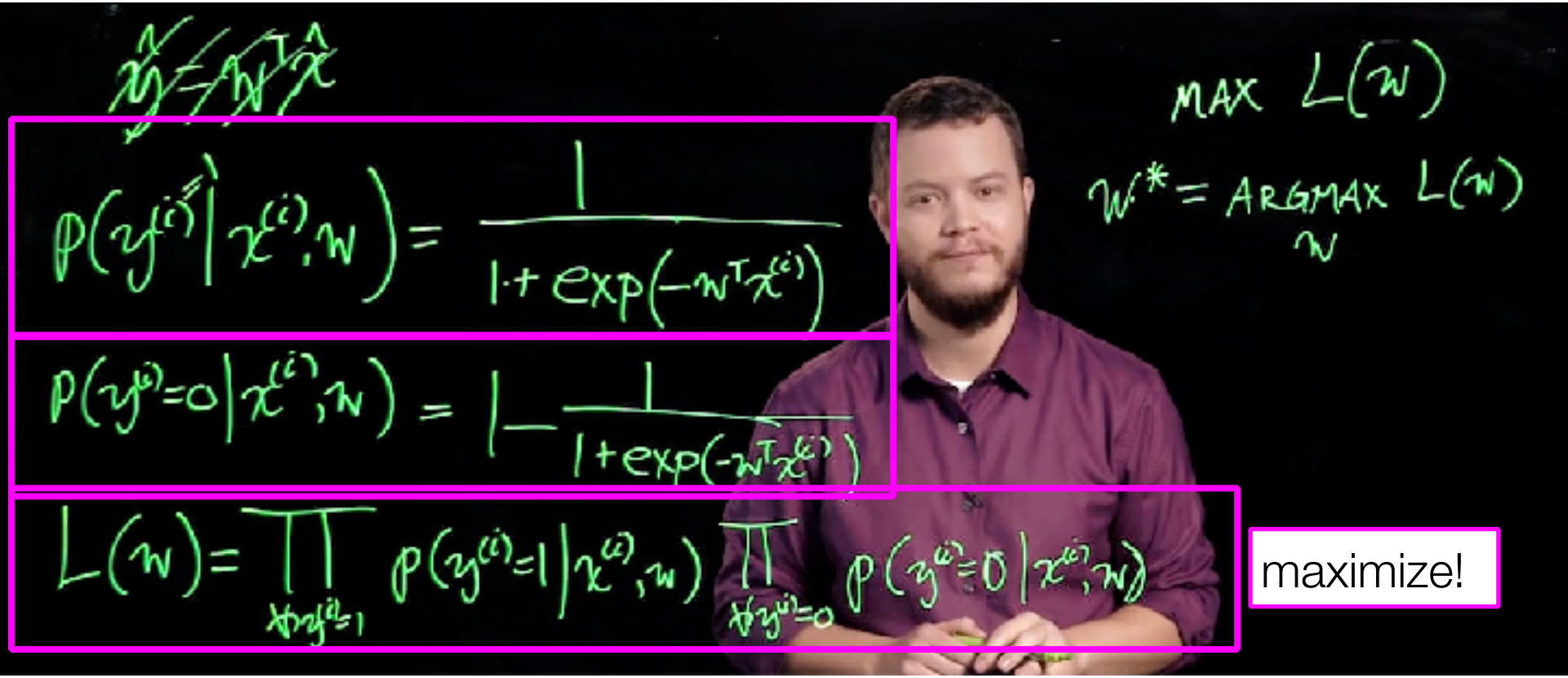
- Welcome back to lecture!
- Logistics
  - A2 Deadline
  - Next week: A3
- Agenda
  - Logistic Regression
    - Solving
    - Programming
    - Finally some real python!

Solving Logistic Regression



Setting Up Binary Logistic Regression

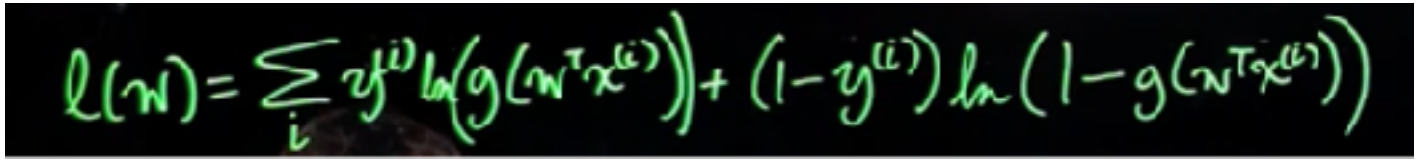
- From flipped lecture:



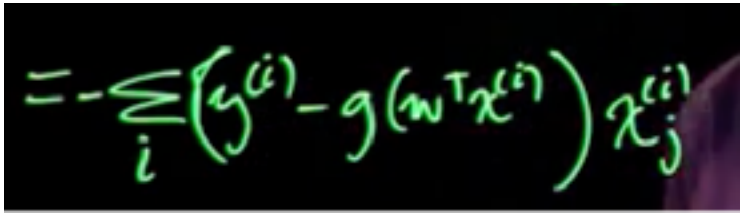
Binary Solution for Update Equation

- Video Supplement (also on canvas):
  - https://www.youtube.com/watch?v=FGnoHdjFrJ8

- General Procedure:
  - Simplify L(w) with logarithm, l(w)



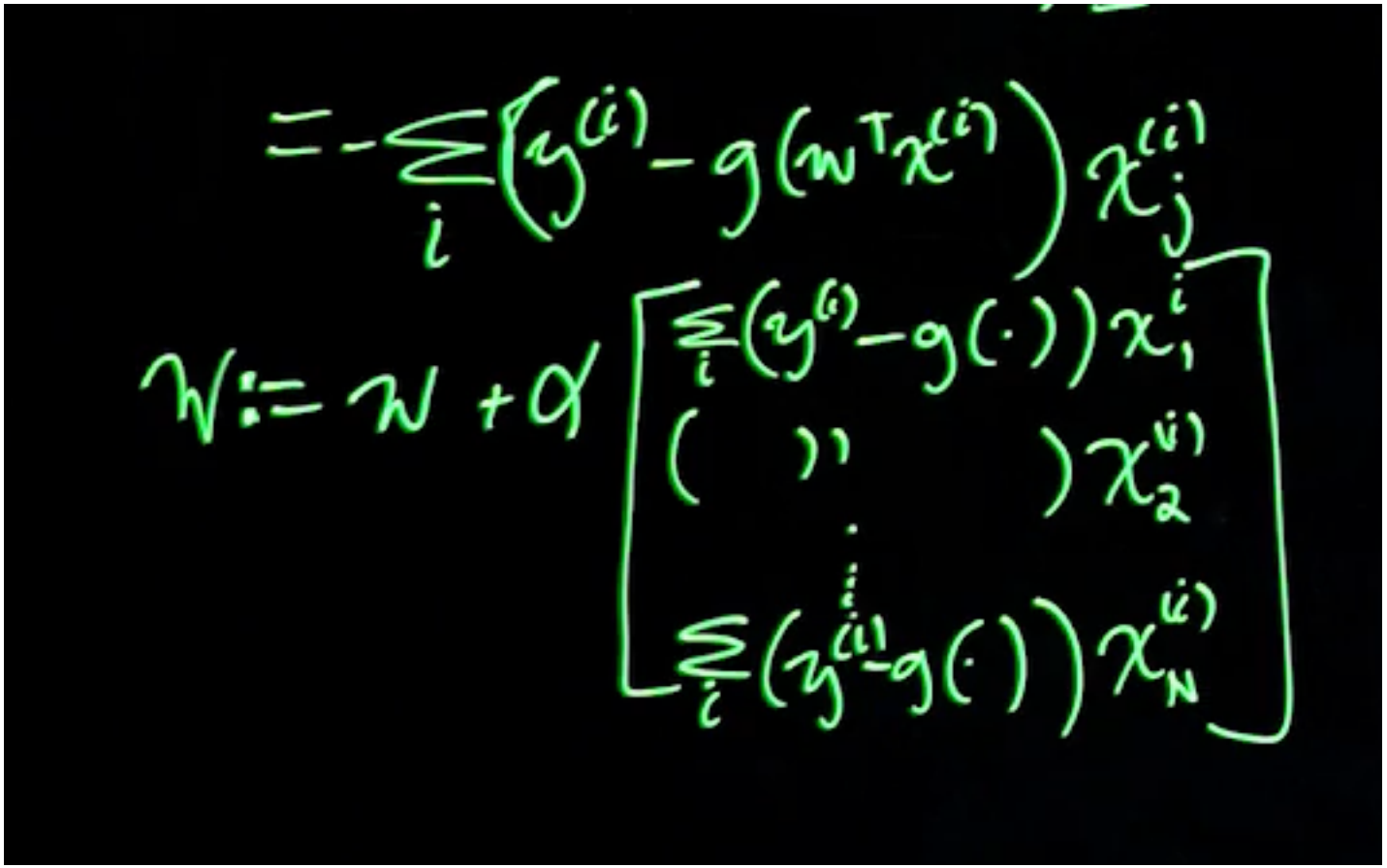
  - Take Gradient



  - Use gradient inside update equation for **w**

Binary Solution for Update Equation

- Use gradient inside update equation for **w**



05. Logistic Regression.ipynb

Demo

Reinvent sklearn
Logistic Regression

Programming
Vectorization
Regularization
Multi-class extension

Other Tutorials:

http://blog.yhat.com/posts/logistic-regression-python-rodeo.html

http://scikit-learn.org/stable/auto_examples/linear_model/plot_iris_logistic.html

For Next Lecture

- **Next time**: More gradient based optimization techniques for logistic regression
- **Next Next time**: SVMs in-class assignment

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Replaced with Jupyter

Professor Eric Larson

Optimization Techniques for Logistic Regression

Scratch Paper

Scratch Paper

Scratch Paper