LIME ML Study
Day 4

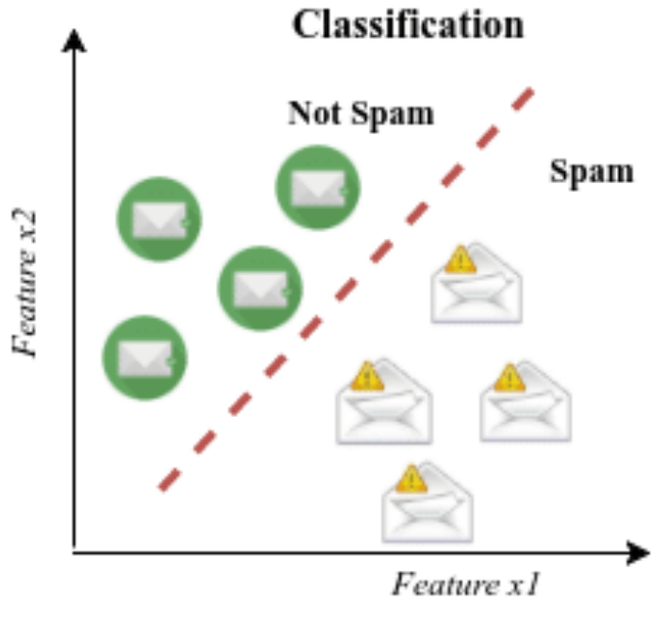
Stanford CS229

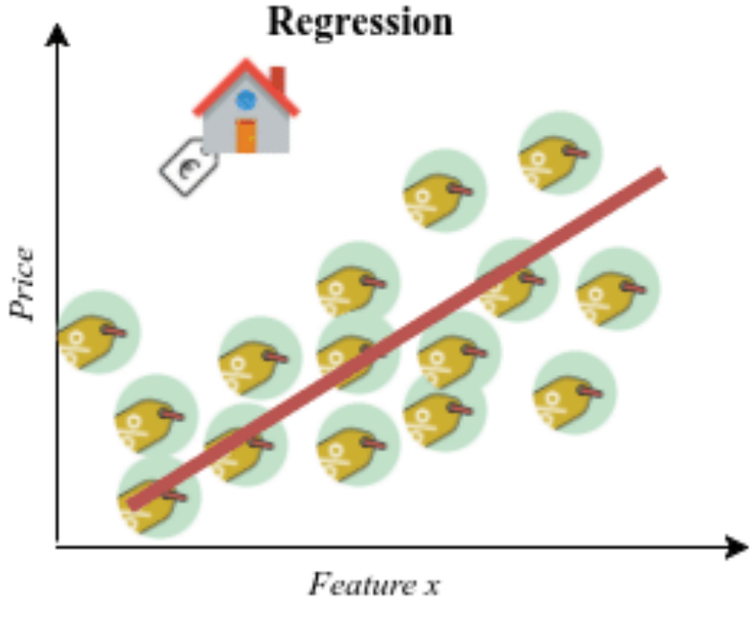
Machine Learning

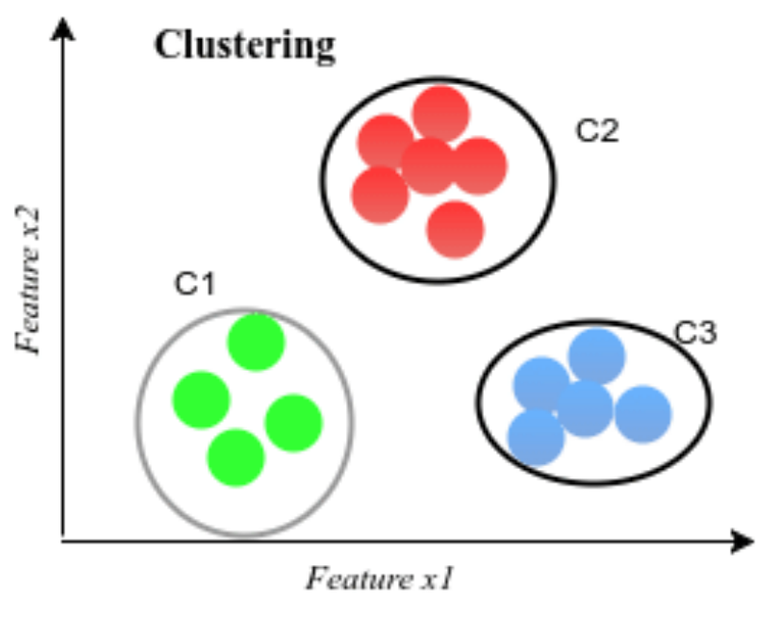
Machine Learning Introduction

Machine Learning 의 정의 : Tom Mitchell

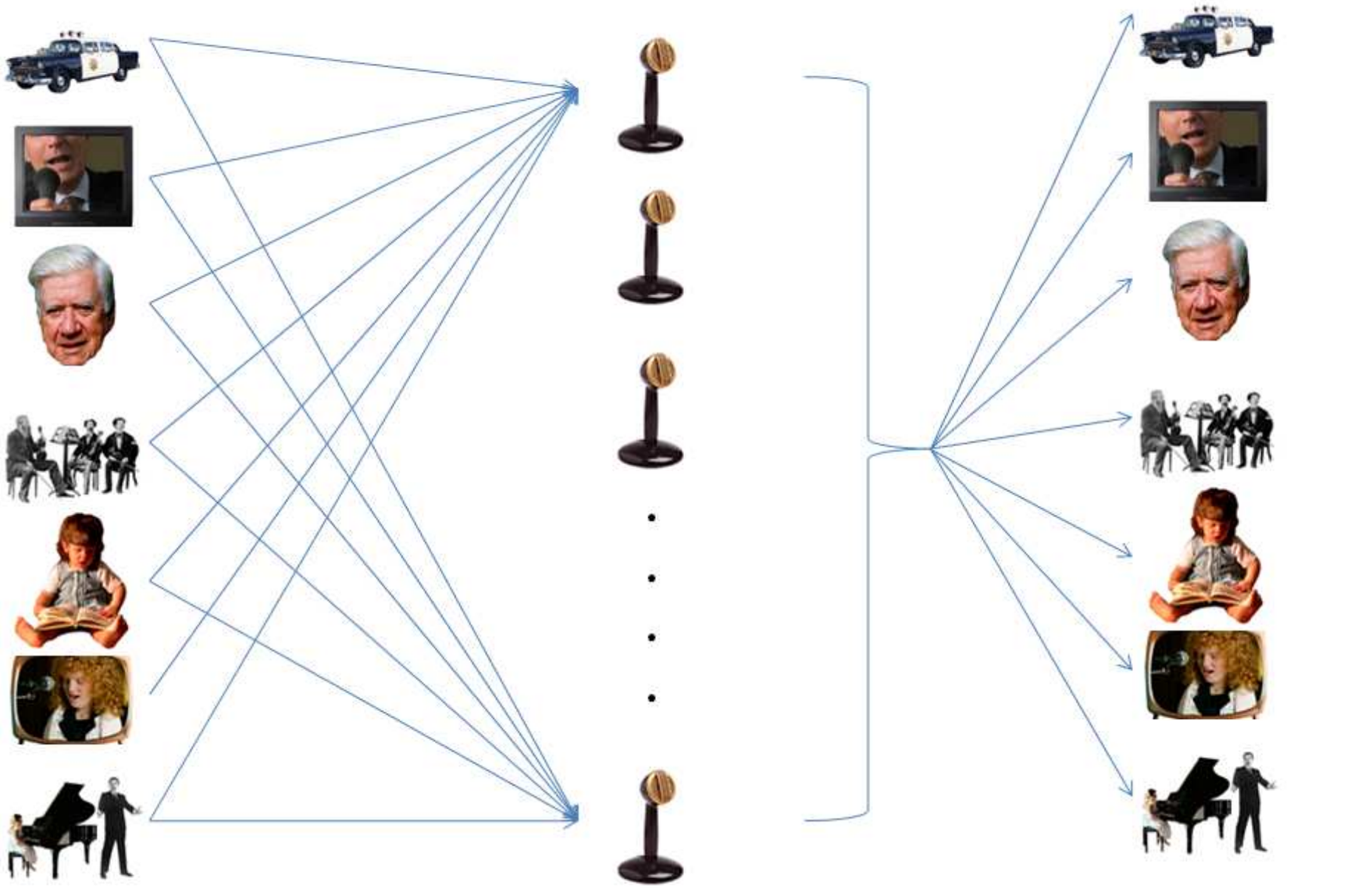
: 과제 T 에 대한 성능이 P 라 측정되고, 경험 E 를 통해 향상될 때,
: 프로그램은 과제 T 에 대해 경험 E 로부터 성능 기준 P 에 따라 학습한다 할 수 있다







Cocktail Party Problem

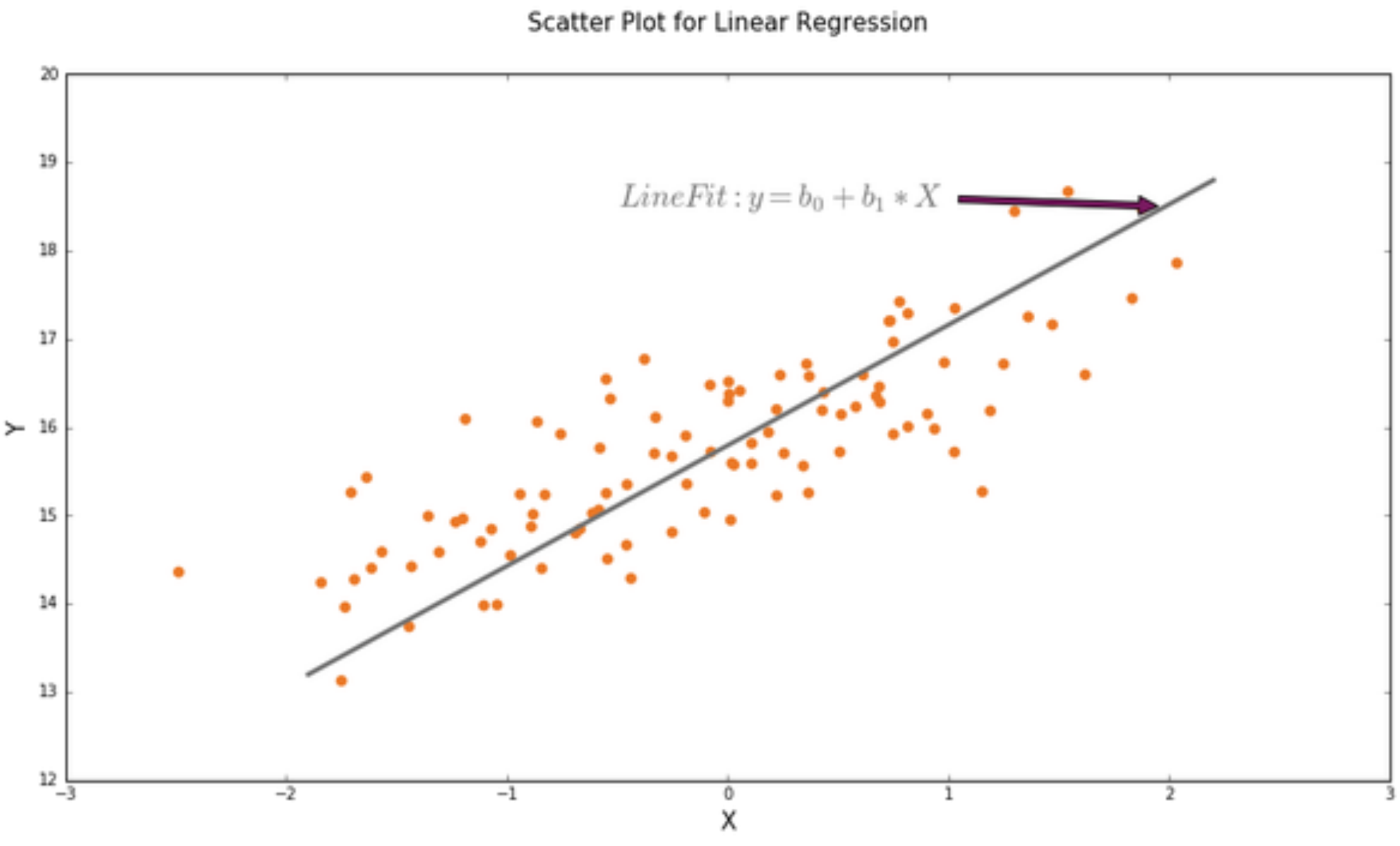


Sources

Mixtures

Separated Sources

Linear Regression



Cost Function

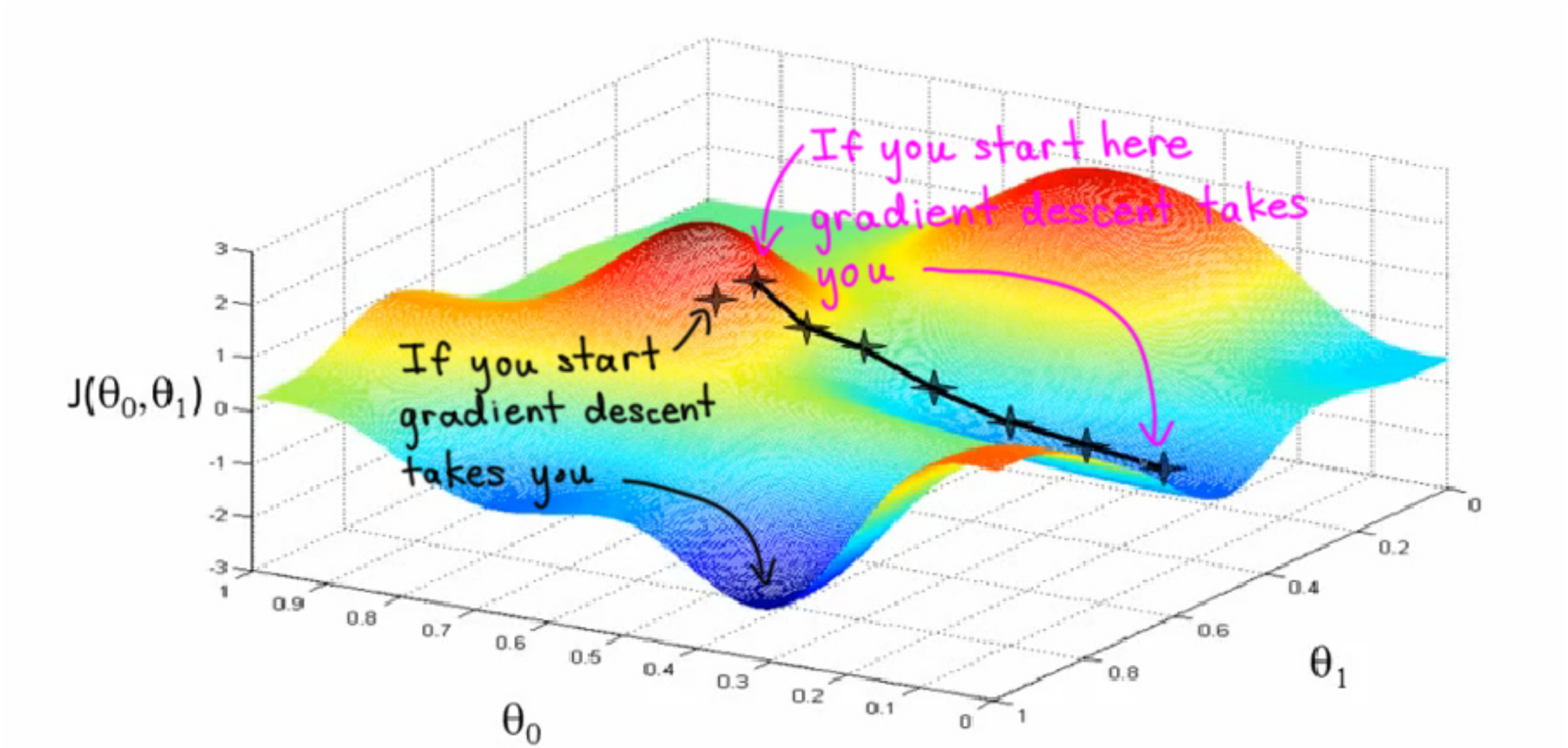
Hypothesis: $h_\theta(x) = \theta_0 + \theta_1 x$

Parameters: θ_0, θ_1

Cost Function: $J(\theta_0, \theta_1) = \frac{1}{2m} \sum_{i=1}^{m} \left(h_\theta(x^{(i)}) - y^{(i)} \right)^2$

Goal: $\underset{\theta_0, \theta_1}{\text{minimize}}\ J(\theta_0, \theta_1)$

Gradient Descent



Matrix Calculation

Array Computation

matrix creation A & B

$$A := \begin{pmatrix} 3 & 6 & -3 \\ 4 & -2 & -5 \\ 2 & -5 & 8 \end{pmatrix} \qquad B := \begin{pmatrix} -2 & 3 & 7 \\ 3 & 5 & 9 \\ 1 & 2 & 6 \end{pmatrix}$$

vector creation v

$$v := \begin{pmatrix} 2 \\ -7 \\ 9 \end{pmatrix}$$

addition of matrixes A & B

$$A + B = \begin{pmatrix} 1 & 9 & 4 \\ 7 & 3 & 4 \\ 3 & -3 & 14 \end{pmatrix}$$

matrix multiplication A*B

$$A \cdot B = \begin{pmatrix} 9 & 33 & 57 \\ -19 & -8 & -20 \\ -11 & -3 & 17 \end{pmatrix}$$

matrix multiplication A*v

$$B \cdot v = \begin{pmatrix} 38 \\ 52 \\ 42 \end{pmatrix}$$

calculation of the return matrix A

$$A^{-1} = \begin{pmatrix} 0.125 & 0.101 & 0.11 \\ 0.128 & -0.092 & -9.174 \times 10^{-3} \\ 0.049 & -0.083 & 0.092 \end{pmatrix}$$

Matrix determinant A

$$|A| = -327$$

Allocation of the second column of a matrix A

$$A^{\langle 2 \rangle} = \begin{pmatrix} -3 \\ -5 \\ 8 \end{pmatrix}$$

matrix transposing B

$$B^T = \begin{pmatrix} -2 & 3 & 1 \\ 3 & 5 & 2 \\ 7 & 9 & 6 \end{pmatrix}$$

matrix multiplication A*A

$$A^2 = \begin{pmatrix} 27 & 21 & -63 \\ -6 & 53 & -42 \\ 2 & -18 & 83 \end{pmatrix}$$

matrix multiplication of the return matrixes

$$A^{-2} = \begin{pmatrix} 0.034 & -5.695 \times 10^{-3} & 0.023 \\ 3.872 \times 10^{-3} & 0.022 & 0.014 \\ 1.87 \times 10^{-5} & 4.938 \times 10^{-3} & 0.015 \end{pmatrix}$$

Expression A^{-2} **displays matrix multiplication of the return matrix** A **on itself**

Expression A^{-n} **displays consecutive multiplication of the return matrix** A **on itself** n **times**

Questions

1.

2.

3.

4.