

CSI 30 LECTURE NOTES (Ojakian)

Topic 8: Matrices

OUTLINE

(References: 2.6)

1. Matrix Addition
 2. Matrix Multiplication
-

1. Matrix Definition

- (a) Definition.
- (b) Dimensions.

2. Matrix Addition

3. Matrix Multiplication

- (a) Small examples
- (b) Find example of non-commutativity.
- (c) Example: $A \cdot B$, where each row of A is a person's buying pattern, and each column of A is some good; the number in an entry is the quantity bought. Each column of B are the prices of the goods in some country.
So $A \cdot B$ gives the amount a person pays in a given country (get estimates from students!).

4. Application: Neural Network

- (a) Basically a matrix multiplication followed by a non-linear function.
- (b) Make example of a 2-layer network with a) 3 inputs, b) 2 nodes in the hidden layer, c) a Heaviside function, d) going to a final single node.
- (c) More advanced: Deep learning - many layers in the neural network.

5. Exercises

Section 2.6: 1 - 4, 10, 11