

COMPUTER SUBJECT: BASIC ML CONCEPTS

TYPE: GROUP WORK ASSIGNMENTS/DISCUSSION

IDENTIFICATION: CHAPTER 4/MICL

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LEVEL: EASY

DURATION: 15-30 min

SIZE: 10 lines!!

OBJECTIVE: Understanding logistic regression elements

REQUIREMENTS: ML Ch. 4

COMMANDS:

IDENTIFICATION: CHAPTER 4/MICL

ML Chapter 4 Assignments in Logistic Regression

The following assignments must be solved in smaller groups (2-4 persons); and they are followed up by a short presentation/discussion in the class the very same day.

Assignment 1

What is logistic regression ?

Assignment 2

What is the difference between linear regression and logistic regression ?

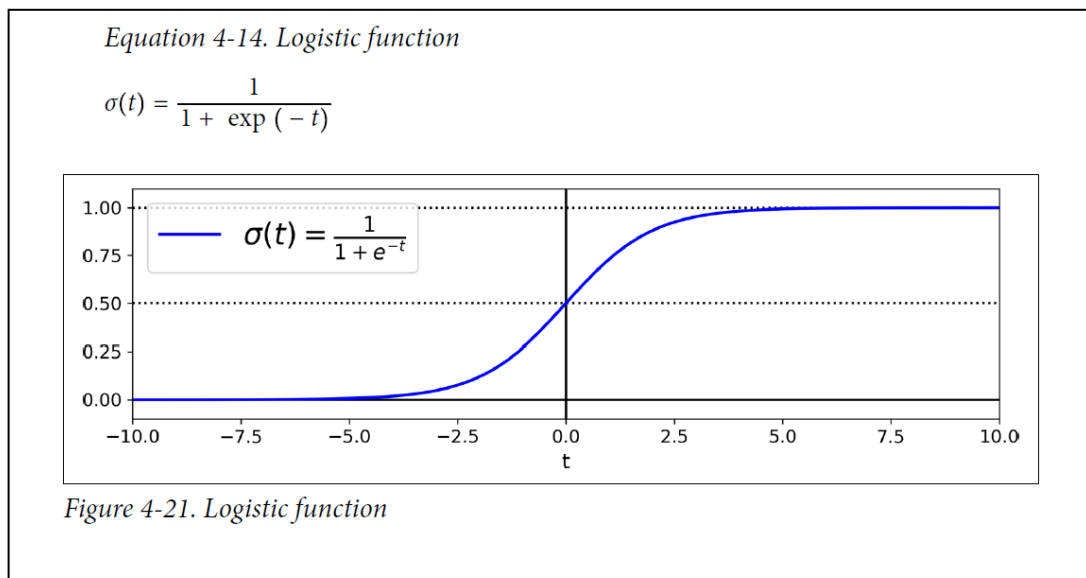
Assignment 3

Give some examples where logistic regression is applicable ?

Assignment 4

Take a look at the figure, 4.21, below.

What is the sigmoid function used for ?



Fill out the following table:

Value t	-5.0	-1.0	0.0	1.0	5.0
$\sigma(t)$					

Assignment 5

Take a look at the cost function, c , for a single training instance in equation, 4.16 below.

Equation 4-16. Cost function of a single training instance

$$c(\theta) = \begin{cases} -\log(\hat{p}) & \text{if } y = 1 \\ -\log(1 - \hat{p}) & \text{if } y = 0 \end{cases}$$

Calculate the cost, c , for different probabilities, p , both for instances of a positive class ($y=1$) and for instances of a negative class ($y=0$). Do this by filling out the table:

probability	0	0.1	0.3	0.5	0.7	0.9	1.0
$y = 0$							
$y = 1$							

Ring a bell ?

Assignment 6

What is L_1 penalty ?

What is L_2 penalty ?

Are they used in Sklearn logistic regression ?

Assignment 7

Suppose you want to classify people in a tourist place in Italy as tourist/native and Corona-case/not Corona case. What kind of classifier(s) would you use ?