

# Errata for “Notes on probability theory and probabilistic Machine Learning”

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## Chapter 1

- pag.9,

$$\begin{aligned} p(x \in \{2, 4, 6\}) &= \sum_{x \in \{2, 4, 6\}} p(x = x) \\ &= p(x = 2) + p(x = 4) + p(x = 6) = \textcolor{red}{0.51}, \end{aligned}$$

- pag.10,

$$p(x \in \{1, 3, 5\}) = 1 - p(x \in \{2, 4, 6\}) = \textcolor{red}{0.49}$$

- pag. 14, there is an extra  
at the end of formula (1.4).
- pag. 15, What is  $p(y = 1)$ ?

$$\begin{aligned} p(y = 1) &= \sum_{x \in \{H, T\}} p(x = x, y = 1) \\ &= p(x = H, y = 1) + p(x = \textcolor{red}{T}, y = 1) = 0.2. \end{aligned}$$

- pag. 16, equation (1.7) should be

$$p(x = x | y = y) = p(x = x)$$

- pag. 16, “The three conditions for independence in Equations  $\textcolor{red}{(1.5)}$ , (1.6) and (1.7)”.
- pag. 17, the same typo above occurs in

$$\begin{aligned} p(y = i) &= \sum_{x \in \{H, T\}} p(x = x, y = i) \\ &= p(x = H, y = i) + p(x = \textcolor{red}{T}, y = i). \end{aligned}$$

- pag. 22, “In practice, we sum all the rows in the table that include the instance  $s = \textcolor{red}{1}$  (colored rows in the following table):”
- pag. 26,

$$p(y = y | x = x, z = z) = p(y = y | z = z)$$

- pag. 23, “we aim to answer”
- pag. 29, “ourcome” should be “outcome”.
- pag. 30, Exercise 8, “Consider the last exercise. We have now a thermometer whose rate of false negative reading is 5% and false positive reading is  $\textcolor{red}{15\%}$ ”
- pag. 31, Exercise 4.b, “We can also solve it by applying Bayes’ rule:

$$p(x = i, y = i | x + y \leq 4) = \frac{p(x + y \leq 4 | x = i, y = i)p(x = i, y = i)}{p(x + y \leq 4)}$$

the numbers at the end should be removed. This is the generic formula.

- pag. 31, Exercise 4.b,

$$p(x = 2, y = 2 | x + y \leq 4) = \frac{p(x + y \leq 4 | x = 2, y = 2)p(x = 2, y = 2)}{p(x + y \leq 4)} = \frac{\frac{1}{36}}{\frac{1}{6}} = \frac{1}{6}$$

- pag. 32, Exercise 6, in the formulas one should use capital  $B$  instead of  $b$  (just a notation issue).
- pag. 33, exercise 7 answer = 0.192. it is 0.19149 and so it should be 0.191 (when rounded).
- pag. 33, “HighTmp” should be “HighTemp”

## Chapter 2

- pag. 38 code at the top of the page, the code can returns 0,1,2,3,4,5 instead 1,2,3,4,5,6 due to the fact that Python counts from zero.
- pag. 39, “and it is also true if we roll the dice more than two times.” This sentence is a bit misleading, I mean that the fact that the probability does not depend on the order of the outcomes even fore more than two rolls.
- pag 48, there is typo in the code:  

```
def predict(self, X):
    return np.argmax(self.predict_proba(X), axis=1)
```
- pag. 49, “the number of possible sentences<sup>s</sup>”
- pag 52,  $p(\text{bye}) \approx 3/48$ .
- pag. 56, Exercise 1, “For instance, the first email (first row) includes the word “money”, does not include “win” and it is **not** spam.”
- pag. 59, “Therefore, for the first row in the dataset we have: **so**” (this extra should be removed)