Pratical work: EM algorithm

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2022-11-06

Simulation

We first generate:

1. A sample of $n = 100$ observations with a Poisson law using $\lambda = 3$.
2. A sample of $n = 200$ observations with a Poisson law using $\lambda = 15$.
3. A vectgor of 300 coordinates, which the 100 first are 1 and the others are 2.

```
sample3 <- rpois(100, 3)
print(sample3)
```

```
##   [1] 3 8 5 5 0 0 3 4 2 4 0 7 7 8 2 2 5 3 5 6 2 6 4 7 4 3 7 3 5 0 2 4 2 4 5 3 5
##  [38] 3 3 4 2 1 1 2 4 1 0 1 4 2 4 4 4 1 3 0 2 1 4 3 5 5 4 1 3 3 0 5 1 3 7 2 2 7
##  [75] 0 4 3 3 4 1 2 1 6 6 4 4 2 3 1 5 2 2 2 8 4 3 4 2 1 3
```

```
sample15 <- rpois(200, 15)
print(sample15)
```

```
##   [1] 13  9 13 12 12 16 21  8 25 17 13 23 11 13 11 10  6 10 14 11 18 14 15 15 16
##  [26] 10 16 22 16 17 18 18 15 16 17 11 14 15  9  8 18 18 18  9  9 13 19 14 10 14
##  [51]  9 18  8 15 13 12 23 22 19 14 12 14  8 10 16 17 13 18 16 16 16 13 15 10 17
##  [76] 19 16 20 10  9 14 16 15 15 11 15 15 17 21 21 21  7 23 12 10 10 12 14  8  9
## [101] 18 16 13 18 19 15 16 15 19 12 14 19 15 11 19 15 21 13 17 13 13  9 12  8 17
## [126] 14 16  8 14 14 11 16 16 15 12 12 13 17 11 12  9 15 18 12 14 15 16 19 16 17
## [151] 25 15 15 19  9 11 14 15 15 15 19 15 14 17 11 11 13 13 14 21 13 19 19 19 15
## [176] 15 12 15  8 21 21 23 18 14 13 26 10 15 19 18 13 14 16 26  9 13  7 15 17  9
```

```
v <- c()
for (i in 1:100)
{
  v <- c(v, 1, recursive = TRUE)
}
for (i in 1:200)
{
  v <- c(v, 2, recursive = TRUE)
}
```

Now, we are going to generate a Poisson law using two components:

```
#Settings constants
pi1 <- 0.4
pi2 <- 0.4
lambda1 <- 3
```

```r
lambda2 <- 15
#Computing sample
```