Computational Statistics Computer Lab 6 (Group 7)

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Question 1: Genetic algorithm (Solved by Qinyuan Qi)

Answer:

(1):

(2):

(3):

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(6):

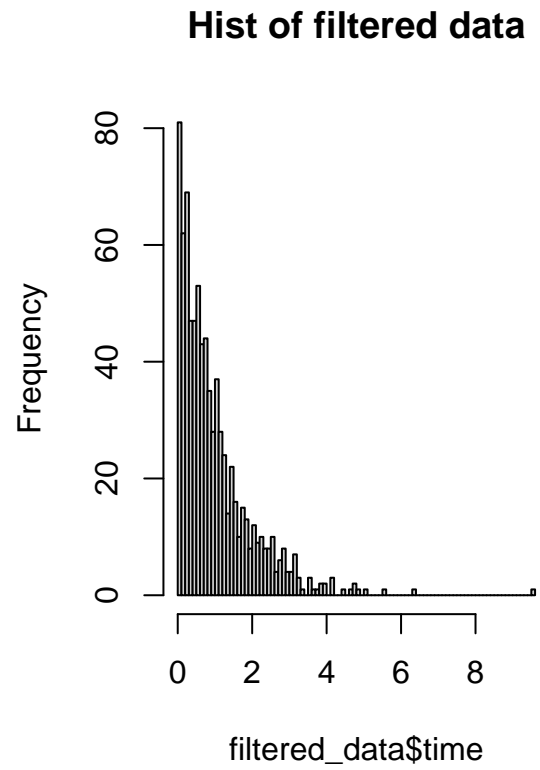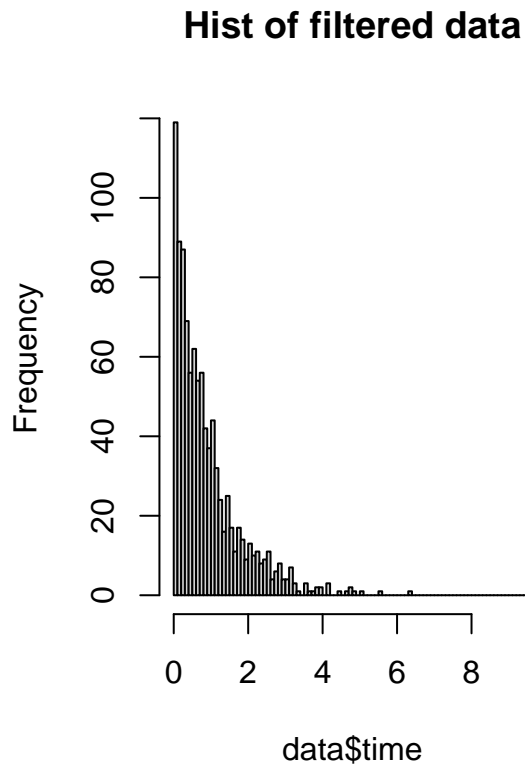**(7):**

(8):

(9):

Question 2: EM algorithm (Solved by Satya Sai Naga Jaya Koushik Pilla)

Answer:

(1) Plot 2 histograms:

According to the plots generated, we found that the plot seems follow exponential distribution.

```
############################### (2.1) ######################################
# Load data
data <- read.csv("censoredproc.csv",
                 sep = ";", header = TRUE)
# We will filter out the records with cens = 2
filtered_data <- data[data$cens != 2,]
layout(matrix(c(1:2), 1, 2))
# plot the data
hist(data$time, breaks = 100, main="Hist of filtered data")
# plot the filtered data
hist(filtered_data$time, breaks = 100, main="Hist of filtered data")
```

Hist of filtered data	**Hist of filtered data**

![Two histograms side by side. Left histogram labeled "data$time" with Frequency on y-axis. Right histogram labeled "filtered_data$time" with Frequency on y-axis.]

(2):

The general PDF form of an exponential distribution is:

$$f(x, \lambda) = \begin{cases} \lambda e^{\lambda x} & x \geq 0 \\ 0 & x < 0 \end{cases}$$

(3):

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