Practical_maximum_likelihood_estimation_ Oscar_Contreras_Rafael_Castilla

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R Markdown

Resolve the following exercise in groups of two students. Write your solution in a Word, Latex or Markdown document and generate a pdf file with your solution. Upload the pdf file with your solution to the corresponding task at the Moodle environment of the course, no later than the hand-in date.

1.(16p) ML estimation of a one-parameter distribution. Let X be a random variable with probability density $f(x|\beta) = \beta x^{b-1}$ with $\geq x \geq 1$, $\beta > 0$ we consider a random sample of n observation of this distribution.

a) (2p) Write down the likelihood function for a sample of n observations of this distribution.
Answer: $L(f(x|\beta)) = \prod_{i=1}^{n} f(x|\beta) = \prod_{i=1}^{n} \beta x^{b-1} = \beta^n x^{nb-n}$

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likelihood<-function(x,b,n){
  l=b^n*x^(n*b-n)
  return(l)
}
```

b) (1p) Obtain the log-likelihood function