

EXERCISE: SUM-OF-A-NATURAL LOGARITHMS OF NATURAL NUMBERS RECURSIVE FUNCTION

PDF report due on Tuesday, may 12, 2015 @ 11:59:59 pm via email.

Email Subject: sumLOG RECURSIVE FUNCTION

Write the recursive function sumLOG(N) that sums the natural logarithms of natural number, n=1,2,3,4,... N:

$$\ln(1) + \ln(2) + \ln(3) + \ln(4) + \ln(5) + \dots + \ln(N)$$

The recursive algorithm:

$$\begin{aligned} \sum_{i=1}^N \ln(i) &= \ln(N) + \sum_{i=1}^{N-1} \ln(i) = \ln(N) + \ln(N-1) + \sum_{i=1}^{N-2} \ln(i) \\ &= \ln(N) + \ln(N-1) + \sum_{i=2}^{N-2} \ln(i) + \dots + \ln(1) \end{aligned}$$

<pre>function [R]=sumLOG(N) % Computes the sum of natural logarithms of the natural % numbers 1,2,3,..,N if N==1 R=log(N); % Stops the recursion else R=log(N)+ sumLOG(N-1); % Also R=log(1); also R=0; end end</pre>	<pre>Command Window: >> sumLOG(1) ans = 0 >> sumLOG(2) ans = 0.6931 >> sumLOG(3) ans = 1.7918 >> sumLOG(4) ans = 3.1781</pre>
---	---