

Note: Bonus questions are entirely optional. They can get very challenging and/or fall outside the course curriculum. Interested individuals may attempt.

6. Let $h(1) = 1$ and $h(n) = \sum_{i=2}^n h\left(\left\lfloor \frac{n}{i} \right\rfloor\right)$ for $n \geq 2$.

Show how you can calculate $h(n)$ in $o(n)$ time and prove rigorously it is indeed $o(n)$ (note the small o).

(Hint: You may need to obtain the bound by evaluating integrals.)