

Algorithms, Spring 2022 at CIS – Homework 4

David Woodruff, TA: Hudson Li

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Please answer the following questions and submit a **pdf** file to neoscholar education platform before **2022/3/26 23:59pm**.

Problem 1

Suppose you have a $\lg n$ bit binary counter. Flipping the first bit costs 1, flipping the second bit costs 2, flipping the third bit costs 4, and in general flipping the i -th bit costs 2^i . What is the amortized cost of counting from 0 to n ?

Problem 2

Redo the proof with the change in potential function for $n = 2$ at the bottom of p.7 here: <http://www.cs.cmu.edu/~15451-f21/lectures/lec03-amortized.pdf>

Problem 3

Do exercise 3 in: <http://www.cs.cmu.edu/~15451-f21/lectures/lec03-amortized.pdf>