CS 344: Design and Analysis of Computer Algorithms **Rutgers: Spring 2021**

Homework #0

Deadline: Monday, January 25, 11:59 PM

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The entire goal of this "homework" is to help you get familiar with LaTeX. This homework only has **bonus credit** for a total of 2% of your course grade.

Problem 1. Enter your first and last name and whether or not you are using an extension at the top of this page in the specified place. **(+20 points)**

Solution. Change the text written as "FIRST LAST" in the command

"\renewcommand{\thisname}{FIRST LAST}"

"\renewcommand{\thisextension}{Yes/No}"

a couple of lines above here.

Problem 2. Write the math expression $\lim_{n\to+\infty} \frac{n}{n^2} = 0$ in a single separate line instead. **(+40 points)**

Solution.

$$\lim_{n\to+\infty} \frac{n}{n^2} = 0$$

Problem 3. Rewrite the following lengthy math expression

$$\sum_{i=0}^{n} 2^i = 1 + 2 + \cdots + 2^n = \frac{2^{n+1} - 1}{2 - 1} = 2^{n+1} - 1 = 2 \cdot 2^n - 1,$$

into multiple lines using the following format:

$$\begin{aligned} \text{Expression 1} &= \text{Expression 2} \\ &= \text{Expression 3} \\ &= \text{Expression 4} \\ &= \text{Expression 5}. \end{aligned}$$

(+40 points)

Solution.

$$\begin{aligned} \sum_{i=0}^{n} 2^i &= 1 + 2 + \cdots + 2^n \\ &= \frac{2^{n+1} - 1}{2 - 1} \\ &= 2^{n+1} - 1 \\ &= 2 \cdot 2^n - 1. \end{aligned}$$
