Problem 1. Arrange the following functions in order of increasing growth rate: $2^\log_2 n$, $2^{2 \log_2 n}$, $n^{5/2}$, $2^n$, $n^2 \log_2 n$. Show your work.

Problem 2. Write pseudo-code for the nursery rhyme, ‘five little monkeys...’ with $n$ monkeys instead of five. You may use the version, https://www.lyrics.com/lyric/17203207/The+Countdown+Kids/Five+Little+Monkeys. Find the exact number of times, the word ‘monkeys’, appears in the rhyme. Show your work. You may use digits for the numbers instead of the words.

Problem 3. You are given two arrays, $A$ and $B$, of lengths, $m$ and $n$, respectively. Write pseudo-code to find whether or not there is a number $x$ in both $A$ and $B$. Return TRUE if you find such number and FALSE otherwise. Find the exact total work (comparisons) in the worst case. Show your work.

Problem 4. You are given an array, $A$, of length $n$. Write pseudo-code to find whether or not $A$ contains a number more than once. Return TRUE if there is such a number and FALSE otherwise. Find the exact runtime to count the number of comparisons in the worst case. Show your work.