CS2302 Data Structures
Spring 2020
Randomization

Individual work, you may ask for assistance from your assigned staff member, the instructor and your teammate form last week.

1. (Randomization) Write a randomized version of quicksort and compare its running time with normal quicksort for randomly ordered and sorted arrays as input.

2. (Randomization) Assume f(n) and g(n) are integer functions implemented in python. Write a method that uses randomization to determine if f is equal to g. For example, suppose $f(n) = (n + 10)^2$; if $g(n) = n^2 + 20n + 100$, your method should return true, if $g(n) = n - 3$, your method should return false.

3. (Randomization) Assume f(t) and g(t) are trigonometric functions implemented in python. Write a method that uses randomization to determine if f is equal to g. For example, suppose f(t) = sin(t)/cos(t); if g(t) = tan(t), your method should return true, if g(t) = cos(2*t) your method should return false.