
The following problems should be done in Julia. Type up the code you used to find your results and answer all questions. Submit your homework via Blackboard by using any program you want and submitting the PDF version of it. This assignment should be submitted no later than 11:59pm on September 14, 2016.

1. This problem does some basic operations and times them:
 - (a) Write a function that takes in an integer n and returns the sum of the positive integers up to n using a `for` loop. For example, this function on 10 should return 55. To make sure that the answer is correct for the values below, we will use larger integers than are standard. The first line of your function should be
`sum=Int128(0)`
 - (b) Time your function for $n = 10^7, 10^8, 10^9, 10^{10}$. What is the relationship between the time taken and n ?
 - (c) Find another way to find the sum that is much faster.
2. This problem examines the factorial function that we saw in class.
 - (a) Rewrite the recursive and non-recursive factorial functions from the class notes.
 - (b) Find the time to run each function for some values of n ? Do you notice a difference?
 - (c) What is the largest value of n that you can compute? Is it the same for both? What happens when you input larger values of n ?
3. A fibonacci number is defined as $F(1) = 1, F(2) = 1$, then $F(n) = F(n-1) + F(n-2)$ for $n \geq 3$. This is naturally a recursive function.
 - (a) Write a procedure F that take a positive integer n and returns the n th Fibonacci number using recursion.
 - (b) Time this function for $n = 30, 35, 40, 45$. What kind of relationship do you notice for this?
 - (c) (Extra Credit) See if you can develop a function that finds these in a faster way.