Coding HW #1

For all of the programs below, write the program as efficiently as you can. Do not use any built-in libraries for the array. You may use referenced source code from the internet. You may use the built-in uniform random number generator and assume it operates in Θ(1). For each problem:

* From an analysis of your code, give a function representing the running time of your code. Give a tight asymptotic bound for that function.
* Run your code for various values of n and time it,
  + Create a chart showing the running times for various values of “n”,
  + Create a graph of the running times vs various values of “n”. Use a linear scale on the axes.
  + Describe how the running times support your analysis of the asymptotic running times.
* Include your source code with your submission.

1. [50 pts] Write a program that takes a value “n” as input and prints “Hello, World” n times.
2. [50 pts] Write a program that takes a value “n” as input; produces “n” random numbers with a uniform distribution between 1 and n and places them in a singly linked list in sorted order. Place them in the list in order, do not sort the array after placing them there. You must have the list source code in your program. You may not use a “built-in” list class or library. You may download the list source code from the internet.

Turn in your assignment as a single pdf file with the answers and source code for all problems.