Assignment 2 INFORMATION ARCHITECTURE, FALL 2019

DUE : 10:00 AM SATURDAY, OCTOBER 5

Problem 1. Perform an experimental analysis of the three methods, `L.sort()`, `L.reverse()`, `len(L)`, for a `list` data type. Visualize their running times as a function of the input size. You may reuse the code shown in the lecture.

Problem 2. Order the following functions by asymptotic growth rate:

$$4n \log n + 2n, 2^{10}, 2^{\log n}, 2^n, n^2 + 10n, \log n^{10000}$$

Problem 3. Given an n-element sequence `S`, Algorithm A calls Algorithm B on each element `S[i]`. Algorithm B runs in $O(i^2)$ time when it is called on element `S[i]`. What is the worst-case running time of Algorithm A?

Problem 4. Give a big-Oh characterization, in terms of N, of the running time of the following code fragment:

```
sum = 0
N = len(S)
i = 1
while i <= N:
    for j in range(1, N):
        sum+=(S[j] * i)
    i*=2
```