COMP 2210 Empirical Analysis Assignment – Part X

George P. Burdell

September 24, 2016

Abstract

This document presents an example for you to follow when creating lab reports for the empirical analysis assignment. Note that the abstract is very important. It should be brief but complete, mentioning the experiment's motivation, method, and results.

1 Problem Overview

Here give a brief summary of the problem being studied and any pertinent background information. You can paraphrase from the assignment handout in this section, as well as add your own material. You'll also want to lay out any assumptions that your work rests on, like the following property perhaps.

$$T(N) \propto N^k \implies \frac{T(2N)}{T(N)} \propto \frac{(2N)^k}{N^k} = \frac{2^k N^k}{N^k} = 2^k \tag{1}$$

2 Experimental Procedure

This section should contain a detailed, thorough description of the procedures that you performed as part of the experiment. Remember—you're writing this so that another student could *repeat* exactly what you did. You should also provide a description of the experimental environment (i.e., machine, operating system, memory, Java version, etc.).

Short code snippets are probably in order for this section (like that shown in Listing 1).

```
System.out.printf("%4s%8s\n", "N", "Time");
for (int i = 0; i < NUM_RUNS; i++) {
   start = System.nanoTime();
   methodToTime(N);
   elapsedTime = System.nanoTime() - start;
   System.out.printf("%4d %8.3f\n", N, (elapsedTime / SECONDS));
   N *= 2;
}
```

Listing 1: Sample code snippet.

3 Data Collection and Analysis

Here describe the data collected when you actually performed the experiment. Data should be presented clearly in tables (like Table 1) with appropriate captions, column labels, etc. An explanation of what each row and column means is required.

Table 1: Running-time data and calculations.

N	Time	R	k
8	0.04	—	—
16	0.08	2.25	1.17
32	0.84	10.37	3.37
64	7.59	9.03	3.18
128	113.56	14.97	3.91
256	1829.28	16.11	4.01
512	29689.21	16.23	4.02

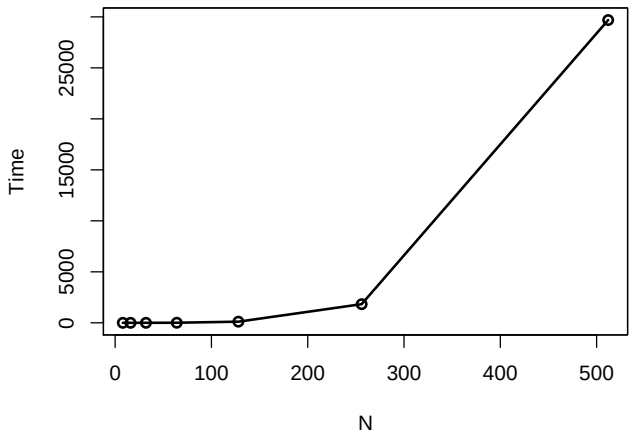

Figure 1: Running-time in seconds for increasing problem sizes.

You must also discuss the analysis of the data. This will include graphs and other figures (e.g. like Figure 1) that you created in analyzing the data.

4 Interpretation

This section should contain a well-reasoned argument that explains your interpretation of the data. That is, what conclusions did you draw and what was your thought process in doing so? You will want to reference things like tables (e.g., Table 1) and figures (e.g., Figure 1) in doing so.