

# CHEM 370 Week 5 Activity

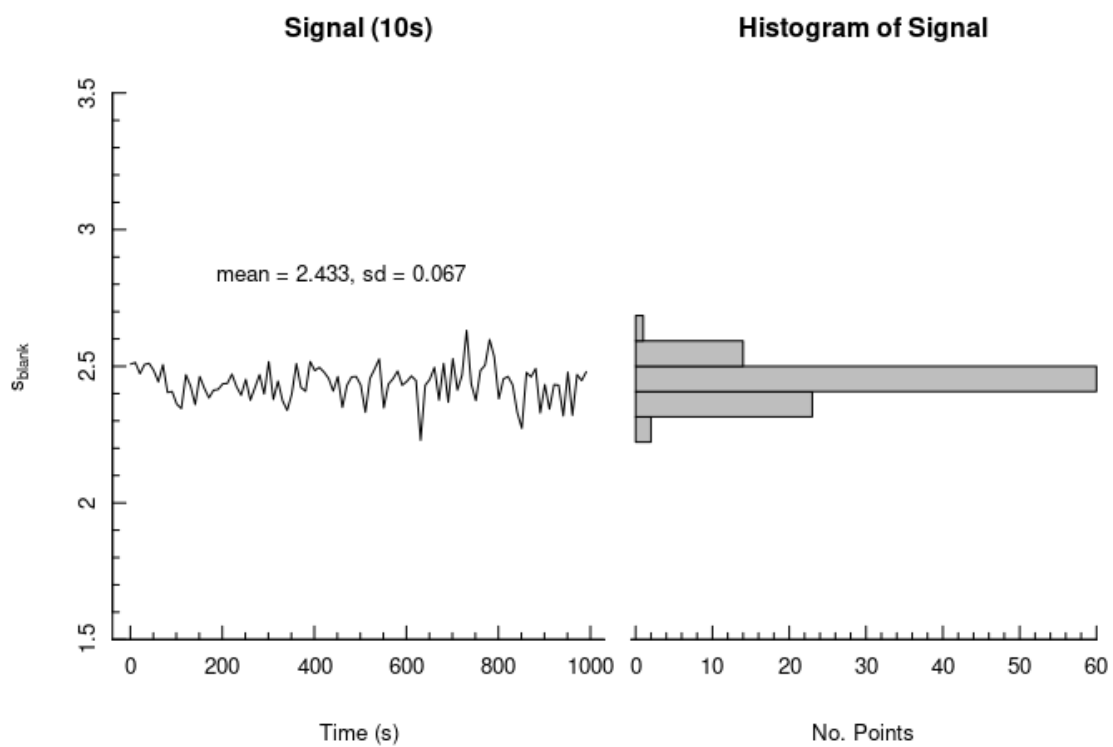
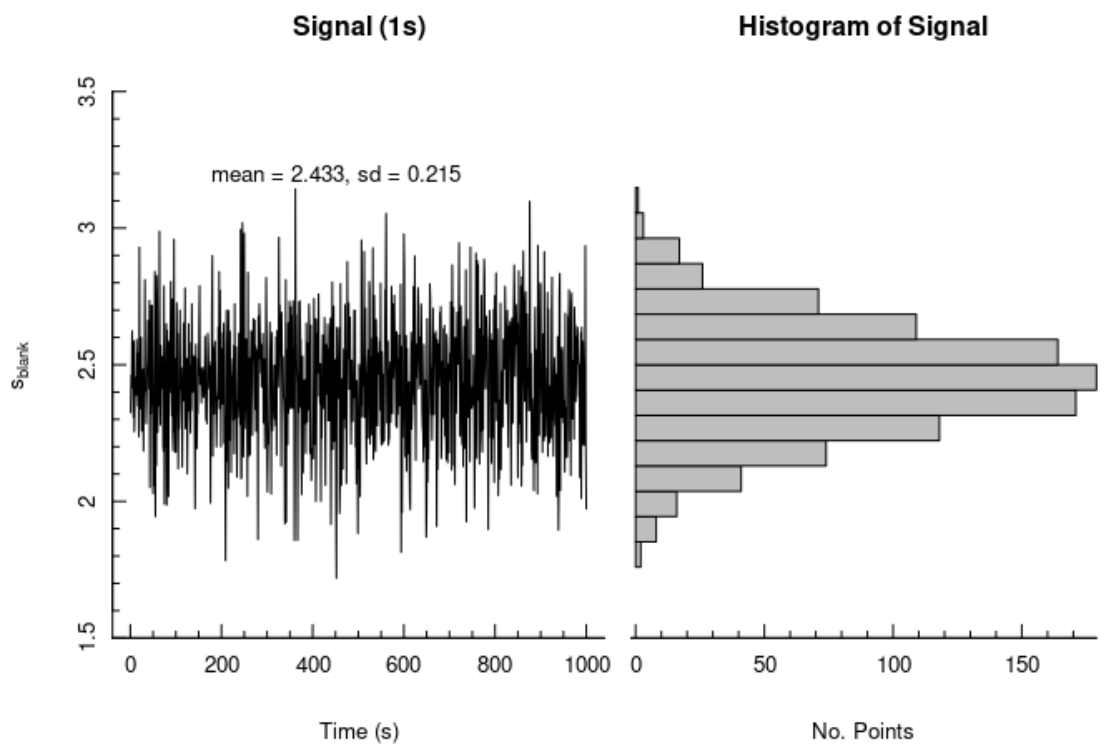
Name: \_\_\_\_\_

## Introduction

This assignment covers Chapters 4 and 5 of *Analytical Chemistry 2.1* by Harvey involving basic analytical chemistry terms, statistical analysis, and confidence intervals.

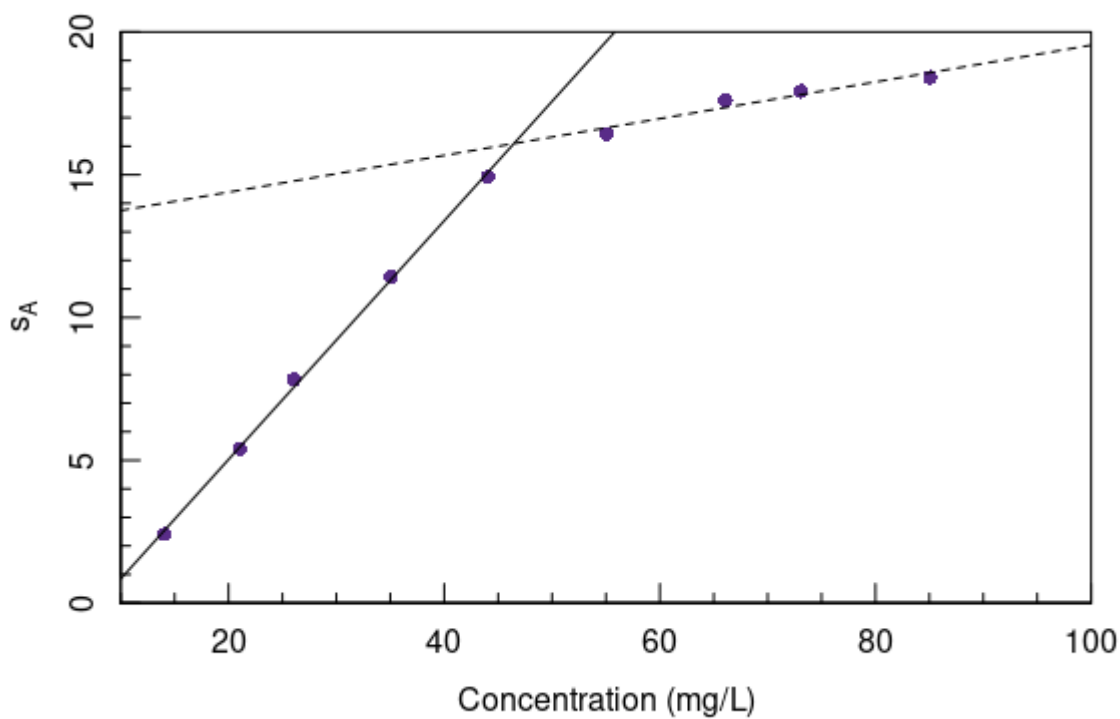
## Lower Limit of Detection

1. The first plot below of signal vs. time was acquired by measuring the baseline (blank) signal from an instrument under development. It was acquired with a signal averaging time of 1 second (sampling rate = 1 Hz). What is the minimum detectable signal level for this instrument?
2. The second plot below shows data from the same instrument, but with a signal averaging time of 10 seconds (sampling rate = 0.1 Hz). What is the minimum detectable signal in this case?
3. What causes the difference observed when the averaging time changes?



## Limits of Quantitation

1. The attached calibration curve is for the same instrument described above. What is the minimum *detectable* concentration?
2. What fraction of the detected signal is actually due solely to random noise and not true signal?
3. What is the minimum *quantifiable* concentration?
4. What is the maximum quantifiable concentration?
5. What is the linear dynamic range (LDR) of the instrument?



Conc (mg/L)	$s_A$
14.07	2.406
21.05	5.401
26.04	7.825
35.07	11.43
44.09	14.93
55.05	16.44
66.09	17.60
73.10	17.93
85.05	18.41

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