DSC 180A Methodology Assignment 4

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1 Deviations

1.1 Setup

Consider a sample of n values, $x_1, x_2, \ldots, x_n$, and let $\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$. Then, the sum of deviations from each x_i to $\bar{x}$ is 0:

$$\begin{aligned}\sum_{i=1}^{n}(x_i - \bar{x}) &= \sum_{i=1}^{n} x_i - \sum_{i=1}^{n} \bar{x} \\ &= n\bar{x} - n\bar{x} \\ &= \boxed{0}\end{aligned}$$

1.2 Runtime Analysis

What is the asymptotic runtime of `standard_deviation`, where $n =$ `len(xs)`?

```
def standard_deviation(xs):
    return (sum([(x - sum(xs) / len(xs)) ** 2 for x in xs]) / len(xs)) ** 0.5
```

$O(n)$	$O(n^2)$
$O(\log n)$	$O(n \log n)$

2 Trivia

How many of the following sentences (some of which are taken from here) are true?

1. Caesar Salad originates from Italy.
2. Brazil is the only nation to have played in every World Cup finals tournament.
3. The original Costco location is in San Diego.

3 Picture

Here's a picture of my bird, "Lele"

- He's 6 years old.
- He's a cockatiel.