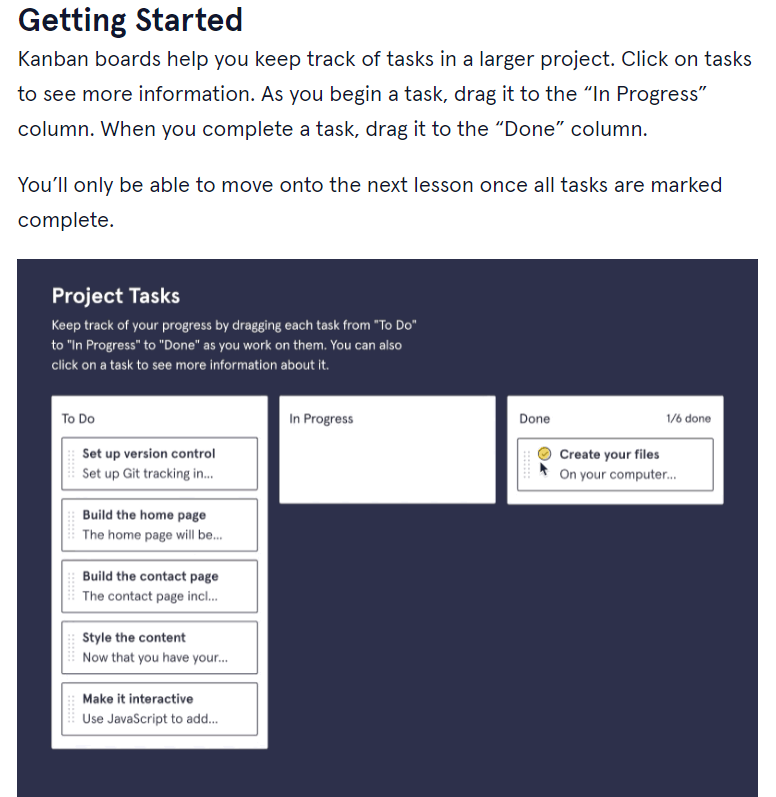
**Project Prompt**

**Optimizing Code with Generative AI**

You’re an intern working for a company where a senior engineer has asked you to implement a class in Python that will accept an array of numbers and compute the average, variance, standard deviation, and median. Before you submit your code, you are told that it must be efficient and optimized for readability, maintainability, and testability. You have the code already prepared, all you have to do now is optimize it. This can be a tedious task, so you will use ChatGPT to do so.

Click Begin to get started!

Overview:  
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**OVERVIEW:**

Optimized code is crucial when writing production-grade code as it makes the code efficient, elegant, and easy to work with. When working on a team to design a product, an engineer must write their code with the consideration that another engineer will need to work with it. Producing poor-quality code can cause others to waste time because they need to refactor it to read it, use it, or test it. Poor-quality code can also be inefficient in its use of computational resources such as the CPU and memory.

In this case study, you will practice refactoring a poorly written Python class called statistics\_calculator used to compute the average, variance, standard deviation, and median of a list of numbers.

*Note: The code you will use for this case study can be found in the Setup section.*

In its current state, the code for statistics\_calculator has several problems, specifically:

* The statistics\_calculator class violates Python naming conventions in that it is in snake case, not Pascal case.
* The class statistics\_calculator has one function called clc which does everything, violating the single responsibility principle for a function.
* The variables are single characters and not descriptive names.
* The function clc name is also not very descriptive.
* clc accepts a string that determines which value to compute, which is error-prone. For example, to compute standard deviation, the correct string is “standard deviation”. However, a user may type “std dev”, “standard deviation”, or “standard dev”, etc… leading to an error.
* The function for median is inefficient as it uses insertion sort to sort the array (an inefficient sorting algorithm).

You will use ChatGPT to improve this code, making it maintainable, testable, readable, and computationally efficient.

**SETUP:**

For this case study, you will need the code for statistics\_calculator found [here](https://static-assets.codecademy.com/ai-case-studies/optimizing_code_with_gen_ai/stats_calculator.py" \t "_blank).

You will also need to sign into (or sign up for) a [ChatGPT](https://chat.openai.com/) account.