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Analysis

1) **The list of items from the description that needed clarification.**

- Which data structure is used to implement a set?
- What data types should we expect from users to enter? Does it only include int, string, and boolean at a time, or can users enter anything?
- What should be done in the get() function, considering that there is no get function in a set data structure?

2) **Your decisions on the items that need clarification.**

- I used ArrayList, which is part of the Java Collection. It is easy to use as it is an index-based data structure.
- After discussing with the professor, we clarified that users can enter any data type. Therefore, we need to create generic functions.
- First, I decided on the functionality of the get() function. We have to pass the index, and in return, the function will provide me the value located at that index. But then I find that Set is not based on ordering, so it is possible that the order in which we insert our data may not be returned in the same order. Then I decided to return the entire set instead of a particular value.

3) **How you showed that your work (so far) is working.**

- I will make sure that I handle all the corner test cases, design the code in such a way that it can easily be modified in the future, and optimize time and space complexity as much as possible.

4) **Identify how you will know that your implementation is working.**

- To check if the code is working under various conditions, I run it through 25 different test cases. These include edge cases, base cases, and weird inputs.

5) **Identify what assurance we have that the code has some quality to it (particularly important if you had an AI tool generate the code)**

- The code has some quality because all the functions I made are of generic type, working with any type of inputs.

6) What difficulties, if any, did you encounter in finally obtaining some working code, and how you dealt with the difficulties.

- Difficulties:
  - ➔ Which data structure to use to implement a set.
  - ➔ In which form we have to take inputs from the user and how to restrict the user from entering wrong inputs.
  - ➔ Instead of creating get, put, contain, and size functions for each data type, make generic functions so that they can be used for all data types, such as int, string, bool, float, etc.

- Solution:
  - ➔ Here, I use an ArrayList as it is easy to use and is an index-based data structure, making it convenient to implement basic functions.
  - ➔ After brainstorming, I decided to let the user enter anything, but at the backend, we can handle all invalid cases.
  - ➔ After thinking for more than 30 minutes, I found an article on Stack Overflow from which I learned that we can use Object if we don't know the input data type. After reading that article, I am clear on how to make generic methods.

7) What you did well in developing the implementation that you could use as an approach to coding a solution to another problem.

- Before attempting this problem, I had never used Objects in Java to take input from the user. From now on, while working on real-world problems where we don't know the input data type, I will try to use this concept.