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Assignment: Homework 1

**Evaluation of the “Implementation of the Set ADT as a Boolean array” Set Class**

**Specification:**  The specification of this class is severely lacking. There are no contracts, or even useful comments provided. To discover how to use the methods requires inspecting the implementation. The class therefore fails to provide clients without access to the implementation the necessary data.

**Design:** Since the Set is a container and can be implemented many different ways, an interface and even possibly an abstract class should have been used in the design. With the current design, the structure is very rigid. There is no functionality to traverse the set, and both the Union and Intersection methods lack the ability to combine and compare sets of different sizes. Had this been noted in the documentation as a pre-condition, it may not qualify as a design problem. The “print” method should never be used. It should be replaced by a more client-friendly toString method.

**Implementation:** The implementation is correct, but very restrictive and confusing. This implementation can only create sets of integers from 1 to n. As I mentioned in design, the Union and Intersection methods can only compare and combine sets of like sizes. The implementation of the isMember method should be edited to contain only one return statement.

**Documentation:** Very little useful documentation is provided. No contracts and unclear comments regarding the functionality of the methods lead to a difficult to navigate implementation.

**Formatting:** Overall, the formatting seems clean. Methods are clearly separated by a blank line and there is no line wrapping. My only possible problem with formatting is that I might prefer to have the methods organized differently to make the class easier to follow, i.e. queries and commands grouped together.

**Efficiency:** Some parts of the implementation are efficient while others leave room for improvement. For example, the constructor’s means of setting each member of the set to false is iterating with a for loop over the array. A linked-based implementation would be more efficient for this.

**Memory Footprint:** The memory footprint varies depending on which constructor is used and how large an array is reserved. If a set could contain possible values between 1 and 300, but the set only has 8 elements, there is significant memory reserved for what is ultimately very little data.