National University

Manila

College of Computing and Information Technologies

Computer Science Department

Programming Languages (CCPGLANG)

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**Title:** Write a program using abstraction.

1. Instruction Analysis

Task: Create a program that demonstrates abstraction.

Focus: Abstraction via an interface that conceals device implementation specifics (e.g., fan, light).

1. Research Summary

One of the fundamental ideas of object-oriented programming (OOP) is abstraction, which enables programmers to concentrate on an object's functionality rather than its underlying workings. Interfaces, which provide a set of methods that must be implemented by any class that utilizes them, are an efficient way to do abstraction in Java (Schildt, 2019). This let each class to give its own implementation of those functions while maintaining consistency.

Because they keep behavior specification and implementation distinct, interfaces are helpful in building adaptable and maintainable systems. Fans and lights, for instance, can use the same appliance interface in a home appliance management system, but when switched on or off, they can each do something special. This illustrates how abstraction streamlines code structure, streamlines program design, and facilitates the implementation of future additions (Horstmann & Cornell, 2024).

References:

1. Horstmann, C. S. (2024). *Core java, volume I: fundamentals*. Pearson Education. Retrieved from <https://ptgmedia.pearsoncmg.com/images/9780132354790/samplepages/0132354799_Sample.pdf>
2. Schildt, H. (2019). *Java: The Complete Reference* (11th ed.). McGraw-Hill Education. Retrieved from <http://www.gandhicollegekada.org/department/Computer/E-Resources/Java-%20The%20Complete%20Reference,%20Eleventh%20Edition%20(%20PDFDrive.com%20).pdf>
3. Design and Implementation
4. Sample Simulations or Test Cases
5. Reflection