CIS 432 Software Architecture and Design Homework #1
(100 points)

Individual Effort; Due Date: 11:59 PM on February 17th

Parnas presents two different modularization approaches in his paper "On the Criteria to Be Used in Decomposition Systems into Modules". The goal of this assignment is to implement the KWIC problem in *Java* based on one of the designs proposed in the paper. You will implement one version of KWIC, choosing either Implementation 1 or Implementation 2 as described below:

Implementation 1:

- Reads all lines from the keyboard,
- Stores all the lines in the core with each word stored as a sequence of characters,
- Circularly shifts all the lines and stores them,
- Alphabetizes the circularly shifted lines, and
- Displays the results on the screen.

Implementation 2:

- Reads the lines from a file,
- Stores all the lines in the core,
- Stores each word as a Word object in the Line Storage,
- Makes an index for the circular shifts instead of storing the shifted lines,
- Considers "interesting" circular shifts only; that is, removes the stop words such as "a", "an", "the", "of", etc.,
- Uses a different sorting algorithm than Implementation 1,
- Outputs to a file

Requirements:

1. Choose **one** implementation to complete (either Implementation 1 or Implementation 2)
2. Design and implement the **modular structure** of your chosen KWIC solution.
3. Document your design and implementation.
4. Follow good software engineering practices, ensuring a clear interface between modules.

Deliverables:

1. Code implementation (70 points) – Correct functionality, modular design, and appropriate data structures.
2. Design document (20 points) – Explanation of design choices, sorting method, and improvements.
3. Code documentation (10 points) – Clear comments and readability.

What to submit:

1. Your source code (formatted and well-documented).
2. Your design document (1-2 pages explaining your approach and design choices).