Homework Assignment 3

SE 311: Software Architecture II

Requirements:

Design and Implement a Client-Server KWIC-Search System

In this assignment, you need to revise the KWIC-Search system you implemented in HW2 to create a client-server System that contains two components:

1. **KWIC-Client**:

The user can enter a keyword from the console, and the system will send the request to the KWIC server. From the user perspective, the scenario should be the same as in HW1:

The user enters a keyword:

- If the keyword is found, the system will return all the sentences containing the keyword. In the returned lines, the keyword will be highlighted. The system will also return the total number of lines containing the keyword. For example, if the input is "*Tiger*," the output should look like this:

  "1 sentence is found:

  Crouching [Tiger] Hidden Dragon"

- If the keyword is not contained in any sentences, the system will return:

  ``[keyword] not found."

- If the server is not responding within 30 seconds, the system will prompt:

  "The KWIC server is not responding."

2. **KWIC-server:**

This component should support the following functions:

- All functions in HW 2
- Respond to search requests from multiple clients: Write a multithreading server using sockets that can receive the keywords from multiple clients and search the keywords from the sentence repository. The server will keep a `log.txt` recording of how many

requests are received and how many search requests are successful, that is, at least one sentence containing the keywords was found.

Submission Guidelines:

You need to turn in the following items from BB Learn:

Item 1: UML Component and Class diagrams

Turn in a ***PDF*** of your UML exported from draw.io.

Do not handwrite your diagram or reverse engineer it from the source code.

You must submit a component diagram with two components, KWIC-Client and KWIC-Server. For each component, draw a Class diagram to show the relations among its internal classes.

If you applied design patterns, please label the name of the patterns and the pattern role a class takes.

Item 2: UML Sequence Diagram

Turn in a ***1-page PDF*** of your sequence diagram, exported from draw.io, demonstrating which and how objects work together to accomplish the following scenario:

The user enters a keyword from the console, the system will return all the sentences containing the keyword both in the original sentences, and the keyword will be highlighted. If the keyword is not contained in any sentences previously entered, the system will return ``[keyword] not found.''; If the server doesn't respond in 30 seconds, prompt "The KWIC server is not responding."

Item 3: Source code in Java, VSCode project

You need to submit two Java projects with the source code of KWIC-Client and KWIC-Server, respectively. You are to use localhost as the server. You need to submit **one .zip file,** and a readme file showing us how to run your program.

Item 4: DSMs and Modularity Scores

- Submit the .dv8-dsm and .dv8-clsx file of HW3
- For HW1, HW2, and HW3, submit the PC and DL scores through this form. If you are using the DV8 trial version, please also submit the M-score.