You are required to attempt any **three (3)** of the five questions below. Upon completion, please upload your solutions to **your GitHub repository** and share the link with us via email, hello@qubittech.co.tz

Question 1: C++ Message Fragmentation Library

Design a C++ library with the following features:

- Fragment long messages into smaller chunks
- Reassemble disorganized fragmented chunks into whole messages
- Callback for missing chunks
- Report corrupted data after a timeout threshold
- Include a test to validate the above features

Question 2: SQL Builder Library

Design a C++ SQL library with the following features:

- SQL Builder Module supporting SQL creation from scratch
- Chain method style for building SQL queries
- Implement lightweight ORM for bidirectional mapping between objects and databases

Question 3: TCP Proxy Server

Write a C++ TCP Proxy server with these features:

- Handle 1000 simultaneous connections
- Distribute connections over a 5-thread pool
- Log formatted data into a file
- Test the capabilities using Postman, Perf, or a custom utility

Question 4: Header-only JSON Library

Write a C++ header-only JSON processing library with the following:

- Parse strings into JSON documents (objects, arrays, values)
- Index and manipulate JSON documents
- Create JSON documents from objects, arrays, or values

Question 5: Log File Processor

Write a C++ program that reads large log files, processes each line, and stores the results in a database. Utilize multithreading where necessary to optimize performance.

Assessment Questions

Submission Guidelines

1. Choose **three** questions from the list above.
2. Complete your solutions and upload the files to a GitHub repository.
3. Provide a link to your repository below:

GitHub Repository Link: Send here, *hello@qubittech.co.tz*

Additional Notes

- Ensure your code is well-documented and thoroughly tested.
- Use any necessary libraries or frameworks you deem appropriate for your solutions.
- The quality of your code, structure, and problem-solving approach will be considered during evaluation.