## Task Description

Implement a thread-safe class for managing a large bitset (e.g. 256bits) that provides some simple operations to manipulate and query individual bits.

Specifications for implementation are provided below and we encourage you to take decisions in the areas where they are open that enable you to speed up your development. Additionally, we recommend not spending more than 2-4 hours on the assignment.

## Requirements

**1. Class Design**

* The class should be thread-safe, ensuring that concurrent operations on the bitmap do not lead to race conditions or inconsistent states.
* The implementation should be memory efficient

**2. APIs to Implement**

* **setBit:** Sets the bit at the specified index to 1.
* **clearBit(index):** Clears the bit at the specified index, setting it to 0.
* **bool getBit(index):** Returns the value of the bit at the specified index (true if the bit is set to 1, false if it is 0).

**3. Additional Considerations**

* **Portability**
* **Unit Tests**
* **Flexibility**

## Implementation details

* The implementation should be in C++

## Deliverables

1. **Source code**
2. **Unit Tests**
   * You can use any framework for unit testing or have tests running in an application that prints a message when tests fail
3. **Documentation**

## Submission

* Submit the implementation via a version control system repository link (e.g., GitHub, GitLab)