# Assignment 2

## Research

You are required to provide answers to the following questions. These answers need to be documented in a word processing application like Microsoft Word, and later converted to a PDF for submission. You should submit a PDF file only. Do not zip the file. These questions will help you in properly understanding the basic concepts that are very important in this module. Your assignment should not exceed 6 pages including the cover page.

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| Question 1 | | Subtotal: | [20] |
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Consider a scenario where you have a multi-threaded application that involves multiple objects interacting with each other concurrently. One of the objects, let's call it Object **A**, has a critical section of code that should only be accessed by one thread at a time to ensure data integrity.

1. Explain how you would implement thread safety for Object A in an object-oriented programming language.
2. Discuss the potential issues that may arise when multiple threads try to access and modify Object A simultaneously.
3. Describe the concept of thread synchronization and provide an example of how you would synchronize the threads accessing Object A.
4. Discuss the trade-offs between using locks and using thread-safe data structures in managing concurrent access to Object A.

## Additional Information

* All work must be done on your own.
* Belgium Campus consist of software that can **scan for plagiarism** and a student caught doing this will get 0 marks for this assignment.
* Late assignments will not be accepted; missing the deadline is an automatic 0.
* All work copied from AI tools like ChatGPT will not be marked.
* All sources used must be shown on the reference list at the end of the assignment.