***Description of the Open Educational Resource:***

***Mutual Exclusion and Critical Region***

***University Of São Paulo***

***Institute of Mathematical and Computer Sciences***

***Class: SSC0640 Operating Systems I***

***Date: 06/17/2015***

**OBJECTIVES**

This open educational resource aims to illustrate two important concepts related to operating systems: critical region and mutual exclusion.

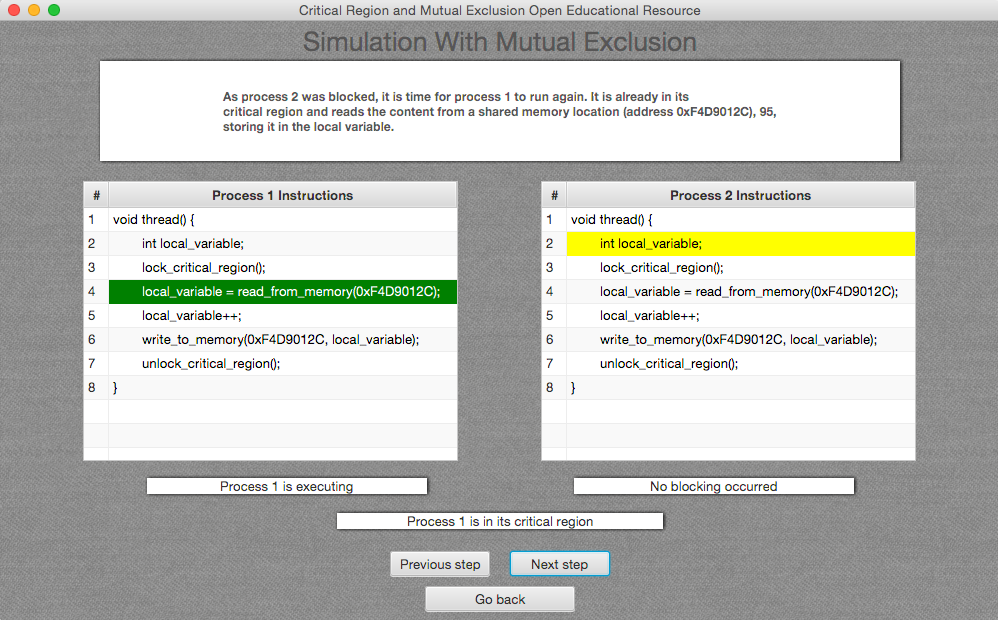
Its objectives are:

* To illustrate the concept of critical region, showing in code examples where it is located;
* To show the importance and the necessity of implementing a mutual exclusion mechanism in concurrent programming where processes share common resources;
* To present an example of how the execution concurrent processes occurs, given the use of a mutual exclusion mechanism and the access to critical regions;
* To illustrate a situation in which the lack of a mutual exclusion mechanism results in unexpected and unwanted behavior.

**UTILIZATION**

The utilization of this open educational resource can be done by:

* Professors, in class, executing the simulations of concurrent processes that illustrate the concepts of critical region and mutual exclusion. After explaining those concepts, the professor can facilitate the understanding of those concepts by using this open educational resource, showing the step-by-step execution of concurrent processes that access their critical regions both when mutual exclusion mechanisms are implemented and when they are not implemented.
* Students, individually and after class. When studying the concepts addressed by this open educational resource, the student will be able to use it as a summary of those concepts and as a simulation tool to visualize the behavior of concurrent processes, focusing on the operation of mutual exclusion and critical region access.

**SNAPSHOT**

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**SYSTEM REQUISITES AND NECESSARY RESOURCES**

* To use this open educational resource, there is no need for special hardware resources;
* In case the user downloads only the .jar file, it is necessary to have the latest version of Java installed in the computer. The latest version of Java was Java 8 when this text was written;
* In case the user downloads the installers for Windows or Macintosh, there is no needed for additional resources.