Topic 4.1: Concurrency Patterns: Monitors

Begin by reading the original papers on monitors that are recommended in the lectures.

The following questions are courtesy of Magee & Kramer, chapter 5.

1. A single-slot buffer may be modelled by:

\[
\text{ONEBUF} = (\text{put} \rightarrow \text{get} \rightarrow \text{ONEBUF}).
\]

Write a Java class, OneBuf, that implements this one-slot buffer as a monitor.

2. In the museum example on Exercise Sheet 2, identify which of the processes, EAST, WEST, CONTROL, and DIRECTOR, should be threads and which should be monitors. Provide an implementation of the monitors.

3. The Dining Savages: A tribe of savages eats communal dinners from a large pot that can hold $M$ servings of stewed missionary. When a savage wants to eat, he helps himself from the pot, unless it is empty, in which case he waits for the pot to be filled. If the pot is empty, the cook refills the pot with $M$ servings. The behaviour of the savages and cook are described by:

\[
\text{SAVAGE} = (\text{get-serving} \rightarrow \text{SAVAGE}).
\]
\[
\text{COOK} = (\text{fillpot} \rightarrow \text{COOK}).
\]

Model the behaviour of the pot as an FSP process and then implement it as a Java monitor.