Joaquim Costa – Dinning Philosophers Documentation

This program will only run in windows.

This program was writing using visual studio 2010.

There are two ways you can go about compiling this program:

1- Import the Philosophers.cs file to a visual studio project and compile it using the IDE.
2- Compile it using the command line.
    a. http://msdn.microsoft.com/en-us/library/1700bbwd%28v=vs.71%29.aspx
    b. When you have setup the environment you can **csc Philosophers.cs** to compile the program.

How to run the program?

To run the program, open the Philosophers.exe file. It will load a console application.

When the program loads, it will display a title and wait for the ENTER key to be pressed.

Press ENTER to start the simulation. The simulation will go into an infinite loop that keeps invoking the pickup and putdown method.

I have setup a statistics method that will trigger every 30 seconds. If you which to change to elapse to shorter/longer time, simply change the ELAPSED_INTERVAL constant.

How to close the program?

- Simply close the window.

Test Plan

This program prevents deadlock and starvation
I have debugged the program and found no deadlock issues.

- The code guarantees that a philosopher only picks up chopsticks when he is hungry, AND the left/right chopsticks are both available.

I used the lock(){} which is basically the same as try{Monitor.Enter()}finally{Monitor.Exit()}.

- This ensures that a thread does not have access to a resource that is in use. When the resource is released it will be available for any thread to use.

To fix the starvation issues I created a **feedStarvingPhiloEvent.**

- This method is triggered every 5 seconds, and it checks if the philosophers that have ate the most have ate 2 times more that the philosophers that have ate the least.
- If this condition is true we help the starving philosopher by setting its left and right neighbors to thinking state and we feed the starving philosopher.

Statistic of the simulation running for 4 minutes with/without the *feedStarvingPhiloEvent*.

Without feedStarvingPhiloEvent		With feedStarvingPhiloEvent	
Philosophers	**Eat Total**	**Philosophers**	**Eat Total**
Joaquim	23	Joaquim	21
Socrates	17	Socrates	24
Plato	20	Plato	23
Aristotle	20	Aristotle	22
Karl Mark	24	Karl Mark	22