Problem Set 10

(10 Points) Cohort Question 1:

Given Exercise1.java, apply SPMD (Single Program, Multiple Data) design pattern for concurrent programming to parallelize the program which approximates π by integration.

(10 Points) Cohort Question 2:

Given SlidingGame.java, parallelize it. Hint: ParallelRecursive.java

(10 Points) Cohort Question 4:

Given StripedMap.java, assume that the objects in the buckets are independent. Complete method **get(), size()** and **clear()** using the idea of lock stripping.

(10 Points) Cohort Question 5:

Given CasCounterTest.java, design and implement a performance test to compare the CAS-based counter (using AtomicInteger) and lock-based counter

(10 Points) Cohort Question 6:

The ABA problem: A CAS effectively asks "Is the value of V still A?" and proceeds with the update if so. What if we really want to ask "Has the value of V changed since I last observed it to be A". Modify NonblockingCounter.java to full-fill the requirement. Hint: use AtomicStampedReference to help.