**Implementation (Java)**

Two variations of concurrent stack were implemented

1. Lock based stack
2. Lock based stack with exchanger array

**Verification of correctness**

The above mentioned implementations were tested based on the following condition, each thread has a local variable and if the thread performs a push operation with value x; x is added to the local variable. Similarly, if a thread performs a pop operation which returned y; y is subtracted from the local variable. At the end of computation, each thread adds the computed value to an array and computes the sum of all the local variables added to the array.

If the difference of sum of all the local variables and items on the stack is 0 then the stack is considered to be consistent.

**Analysis**

Following test was performed for threads varying from 1 to 128 by a factor of 2 with 100,000 and 1,000,000 operations on TACC machines