**Course:** High Performance Computing Lab

**Practical No. 4**

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**Title of practical:**

Study and Implementation of Synchronization

**Problem Statement 1:**

# Analyze and implement a Parallel code for below programs using OpenMP considering synchronization requirements. (Demonstrate the use of different clauses and constructs wherever applicable)

# Fibonacci Computation:

**Screenshots:**

**Information:**

**Synchronization:**In Fibonacci computation, each element fib[i] depends on the previous two (fib[i-1] and fib[i-2]). Without proper synchronization, threads might read uninitialized values.

**OpenMP Constructs Used:**

|  |  |
| --- | --- |
| **#pragma omp parallel** | **Creates multiple threads for parallel execution.** |
| **#pragma omp single** | **Ensures only one thread initiates the tasks.** |
| **#pragma omp task** | **Defines independent units of work to be executed in parallel.** |
| **#pragma omp taskwait** | **Waits for all created tasks to complete before proceeding.** |

**Clauses Demonstrated:**

* firstprivate(i): Ensures each task gets its own copy of i.
* taskwait: Synchronizes dependent calculations.

**Problem Statement 2:**

# Analyze and implement a Parallel code for below programs using OpenMP considering synchronization requirements. (Demonstrate the use of different clauses and constructs wherever applicable)

# Producer Consumer Problem

**Screenshots:**

**Information:**

**Github Link:**