CSE4001 - Parallel and Distributed Computing, Fall 2019
Vellore Institute of Technology
Instructor: Prof Deebak B D - SCOPE

Lab report

Title of Lab: Work Sharing OpenMP
Assessment #: 4
Date: 19|08|2019

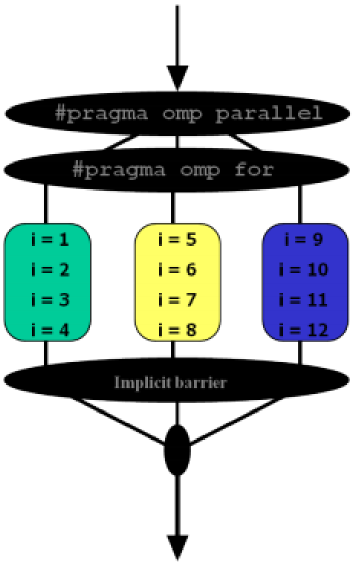
Author's name: Gagan Deep Singh
Registration ID: 17BCI0140
Lab section: Friday L59 + L60

SCENARIO

Write a simple OpenMP program to employ a *'Work Sharing'* clause to assign each thread an independent set of iterations. In order to explore its practical use, you are advised to read and understand the following statements.

1. Assign each thread an independent set of iterations;
2. Threads must wait at the end
3. Can combine the directives:
4. #pragma omp parallel for
5. Only simple kinds of for loops:
    a. Only one signed integer variable
    b. Initialization: var=init
    c. Comparison: var op last op: , <=, >=
    d. Increment: var++, var--, var+=incr, var-=incr, etc.

Execution Scenario:

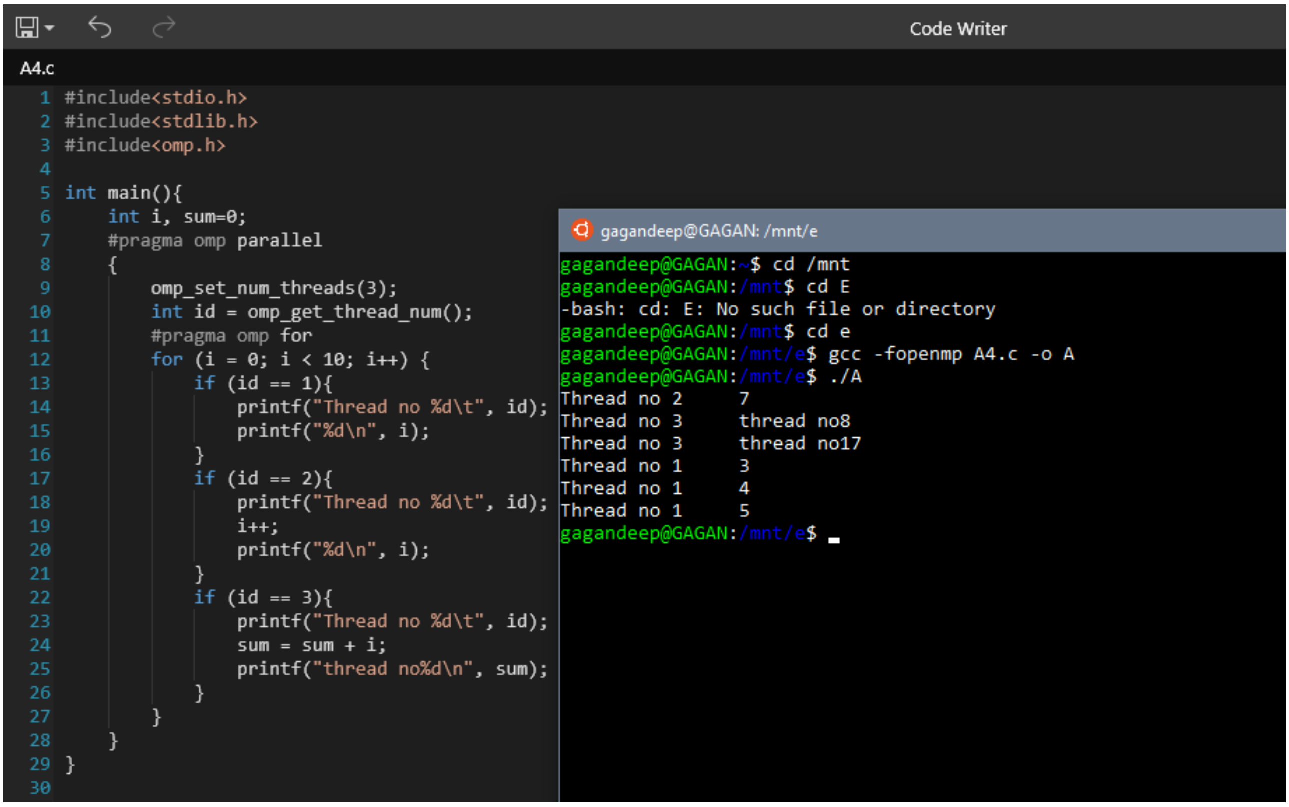


SOURCE CODE:

```c
#include<stdio.h>
#include<stdlib.h>
#include<omp.h>

int main(){
        int i, sum=0;
        #pragma omp parallel
        {
                omp_set_num_threads(3);
                int id = omp_get_thread_num();
                #pragma omp for
                for (i = 0; i < 10; i++) {
                        if (id == 1){
                                printf("Thread no %d\t", id);
                                printf("%d\n", i);
                        }
                        if (id == 2){
                                printf("Thread no %d\t", id);
                                i++;
                                printf("%d\n", i);
                        }
                        if (id == 3){
                                printf("Thread no %d\t", id);
                                sum = sum + i;
                                printf("thread no%d\n", sum);
                        }
                }
        }
}
```

EXECUTION:



```c
#include<stdio.h>
#include<stdlib.h>
#include<omp.h>

int main(){
    int i, sum=0;
    #pragma omp parallel
    {
        omp_set_num_threads(3);
        int id = omp_get_thread_num();
        #pragma omp for
        for (i = 0; i < 10; i++) {
            if (id == 1){
                printf("Thread no %d\t", id);
                printf("%d\n", i);
            }
            if (id == 2){
                printf("Thread no %d\t", id);
                i++;
                printf("%d\n", i);
            }
            if (id == 3){
                printf("Thread no %d\t", id);
                sum = sum + i;
                printf("thread no%d\n", sum);
            }
        }
    }
}
```

```
gagandeep@GAGAN:~$ cd /mnt
gagandeep@GAGAN:/mnt$ cd E
-bash: cd: E: No such file or directory
gagandeep@GAGAN:/mnt$ cd e
gagandeep@GAGAN:/mnt/e$ gcc -fopenmp A4.c -o A
gagandeep@GAGAN:/mnt/e$ ./A
Thread no 2     7
Thread no 3     thread no8
Thread no 3     thread no17
Thread no 1     3
Thread no 1     4
Thread no 1     5
gagandeep@GAGAN:/mnt/e$ _
```