Experiment 4

**Aim: To implement programs based on conditional clause and parallel reduction operations.**

***Compilation and execution:***

**gcc -fopenmp condition\_example.c -o condition\_example**

**./condition\_example**

**Assignment 1: Write a Program in OpenMP using conditional clause to print values in serialized and parallelized mode.**

**Solution:**

**#include <stdio.h>**

**#include <omp.h>**

**void test(int val) {**

**#pragma omp parallel if(val)**

**if (omp\_in\_parallel()) {**

**#pragma omp single**

**printf("val=%d, parallelized with %d threads\n", val, omp\_get\_num\_threads());**

**} else {**

**printf("val=%d, serialized\n", val);**

**}**

**}**

**int main() {**

**omp\_set\_num\_threads(4);**

**test(0);**

**test(4);**

**}**

**Output-:**

****

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**Assignment 2: Write a Program in OpenMP to calculate the sum of first 100 natural numbers using parallel reduction.**

**Solution:**

**#include <stdio.h>**

**#include <omp.h>**

**void main()**

**{**

**int i,sum=0;**

**omp\_set\_num\_threads(4);**

**#pragma omp parallel**

**{**

**#pragma omp for reduction(+:sum)**

**for(i=1;i<=100;i++)**

**sum+=i;**

**}**

**printf("Sum=%d\n",sum);**

**}**

**Output-:**

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**Practice Assignment (NOT TO BE WRITTEN IN LAB MANUAL) : Write a Program in OpenMP to calculate the sum of first 100 natural numbers without using parallel reduction.**

**Solution:**

**#include <stdio.h>**

**#include <omp.h>**

**int main()**

**{**

**int i,sum = 0;**

**int thread\_sum[4];**

**omp\_set\_num\_threads(4);dc**

**#pragma omp parallel**

**{**

**int ID=omp\_get\_thread\_num();**

**thread\_sum[ID]=0;**

**#pragma omp for**

**for(i=1;i<=100;i++)**

**{**

**thread\_sum[ID]+=i; // Individual thread sum**

**}**

**}**

**for(i=0;i<4;i++)**

**sum+=thread\_sum[i]; // Gathered thread sum**

**printf("Sum=%d",sum);**

**}**

***Compilation and execution:***

**gcc -fopenmp practice.c -o practice**

**./practice**