

## Parallel Prefix Sum

```
#include <iostream>
#include "omp.h"
#include <math.h>
#define N 10
int main()
{
    clock_t start, end;
    double cpu_time_used;
    start = clock();
    int id,A[N]={4,3,8,2,9,1,0,5,6,3},B[N],i;
    B[0]=A[0];
    for(int j=0; j<=ceil(log(N)); j++)
    {
        omp_set_num_threads(N-1);
        #pragma omp parallel
        {
            #pragma omp critical
            {
                id=omp_get_thread_num()+1;
                if((id-(int)pow(2,j))>=0)
                    B[id]=A[id]+A[id-(int)pow(2,j)];
            }
        }
        #pragma omp for
        for(i=0; i<N; i++)
            A[i]=B[i];
    }
    std::cout<<"\n";
    for(int i=0; i<10; i++)
        std::cout<<A[i]<<" ";
    std::cout<<"\n";
    end = clock();
    cpu_time_used = ((double) (end - start))/ CLOCKS_PER_SEC;
    std::cout<<"\nTime Taken: "<<cpu_time_used<<"\n";
    return 0;
}
```

```
prachi@prachi-Vostro-1014:~$ g++ -fopenmp 4p.c++ -o p
prachi@prachi-Vostro-1014:~$ ./p
4, 7, 15, 17, 26, 27, 27, 32, 38, 41,
Time Taken: 0.001181
prachi@prachi-Vostro-1014:~$ g++ 4s.c++ -o p
prachi@prachi-Vostro-1014:~$ ./p
4, 3, 8, 2, 9, 1, 0, 5, 6, 3,
4, 7, 15, 17, 26, 27, 27, 32, 38, 41,
Time Taken: 0.126
prachi@prachi-Vostro-1014:~$
```