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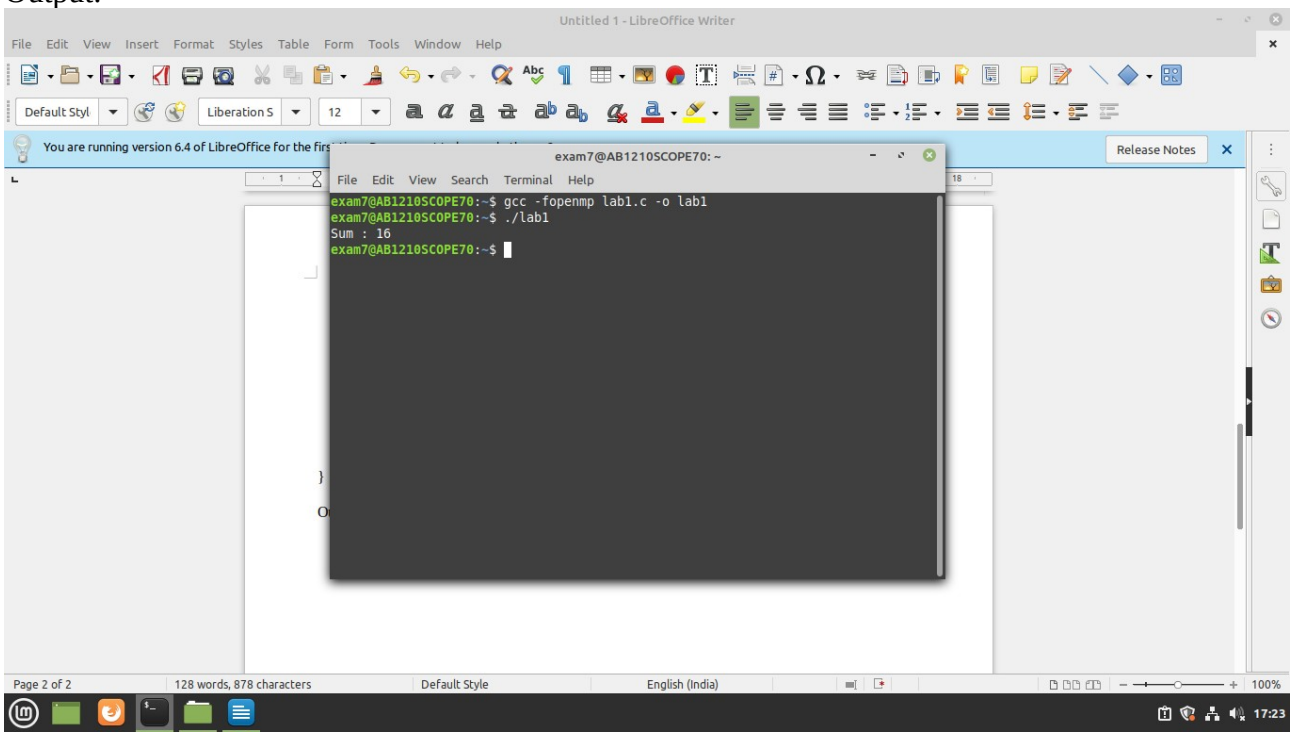
Question 1:
Code:

```
#include <omp.h>
#include <unistd.h>
#include <stdlib.h>
#include <pthread.h>
#include <sys/time.h>
#include <stdio.h>
#define n1 6
int main()
{
	int m=2,n=1,p=2,i;
	for(i=1;;i++)
	{
		if(i%2==0)
		{
			//printf("%d, ",m);
			m+=m;
		}
		else if(i%2!=0)
		{
			//printf("%d, ", n);
			n+=p;
			p++;
		}
		if(n>n1 && m>n1)
		break;
	}
	//printf("\n%d",i);
	int k=i;
	int arr[i];
	m=2,n=1,p=2;
	omp_set_num_threads(5);
	#pragma omp parallel for private(i) shared(arr) ordered
	for(i=1;i<=k;i++)
	{
		if(i%2==0)
		{
			//printf("%d, ",m);
			arr[i-1] = m;
			m+=m;
		}
		else if(i%2!=0)
		{
			//printf("%d, ", n);
			arr[i-1] = n;
			n+=p;
			p++;
		}
```

```
		//if(n>n1 && m>n1)
		//break;
	}
	int sum = 0;
	#pragma omp parallel for private(i) shared(arr) reduction(+: sum) ordered
	for (i = 0; i < n1; ++i) {
		sum += arr[i];
	}
	printf("Sum : %d\n",sum);
	return 0;

}
```

Output:



Question 2 :
Code:

```
#include <mpi.h>
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#define n 5
int main(int argc, char * argv[]){
	int j=0,count=0;
	for(j=1;j<=n;j++)
	{
		count++;
		j++;
	}
```

```
	int a[100],a2[100];
	int elements_per_process,elements_left, n_elements_recieved;
	int np, pid;
	int m=0;
	for(j=1;j<=n;j++)
	{
		a[m] = j;
		m++;
		j++;
	}
	MPI_Status status;
	MPI_Request request = MPI_REQUEST_NULL;
	MPI_Init( & argc, & argv);
	MPI_Comm_size(MPI_COMM_WORLD, & np);
	MPI_Comm_rank(MPI_COMM_WORLD, & pid);
	if (pid == 0) {
		int index, i;
		elements_per_process = count / np;
		if (np > 1) {
			for (i = 1; i < np - 1; i++) {
			index = i * elements_per_process;
			MPI_Send( & elements_per_process,1, MPI_INT, i,
0,MPI_COMM_WORLD);
			MPI_Send( & a[index],elements_per_process,MPI_INT, i,
0,MPI_COMM_WORLD);
			}
			index = i * elements_per_process;
			int elements_left = count - index;
			MPI_Send( & elements_left,1, MPI_INT,i, 0,MPI_COMM_WORLD);
			MPI_Send( & a[index],elements_left,MPI_INT, i, 0,MPI_COMM_WORLD);
		}
		int sum = 0;
		for (i = 0; i < elements_per_process; i++)
			sum += a[i];
		int tmp;
		for (i = 1; i < np; i++)
		{
			MPI_Recv(&tmp, 1, MPI_INT, MPI_ANY_SOURCE, 0,
MPI_COMM_WORLD, &status);
			int sender = status.MPI_SOURCE;
			sum += tmp;
		}
		printf("Sum of array is : %d\n", sum);
	}
	else
	{
		MPI_Recv(&n_elements_recieved,1, MPI_INT, 0, 0,MPI_COMM_WORLD,
&status);
		MPI_Recv(&a2, n_elements_recieved,MPI_INT, 0, 0,MPI_COMM_WORLD,
&status);
		int partial_sum = 0;
		for (int i = 0; i < n_elements_recieved; i++)
```

```
                partial_sum += (a2[i]*a2[i]);
            MPI_Send(&partial_sum, 1, MPI_INT,0, 0, MPI_COMM_WORLD);
        }
        MPI_Finalize();
        return 0;
}
```

Output: