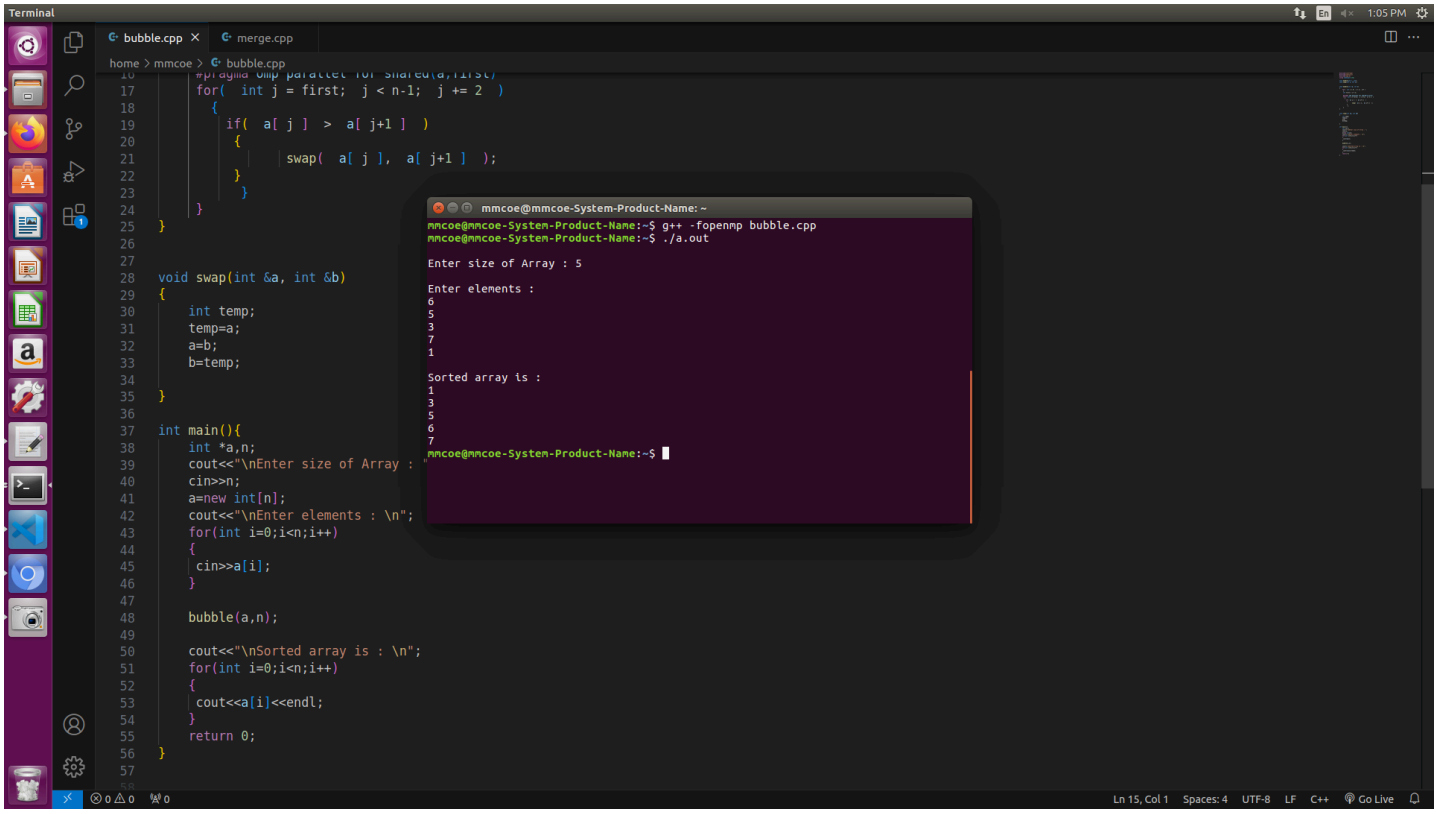
Bubble sort

```
#include<iostream>
#include<stdlib.h>
#include<omp.h>
using namespace std;

void bubble(int *, int);
void swap(int &, int &);


void bubble(int *a, int n)
{
    for(  int i = 0;  i < n;  i++ )
     {
     int first = i % 2;

     #pragma omp parallel for shared(a,first)
     for(  int j = first;  j < n-1;  j += 2  )
      {
        if(  a[ j ]  >  a[ j+1 ]  )
         {
               swap(  a[ j ],  a[ j+1 ]  );
         }
         }
    }
}

void swap(int &a, int &b)
{
    int temp;
    temp=a;
    a=b;
    b=temp;

}

int main(){
    int *a,n;
    cout<<"\nEnter size of Array : ";
    cin>>n;
    a=new int[n];
    cout<<"\nEnter elements : \n";
    for(int i=0;i<n;i++)
    {
     cin>>a[i];
    }

    bubble(a,n);

    cout<<"\nSorted array is : \n";
    for(int i=0;i<n;i++)
    {
     cout<<a[i]<<endl;
```

```
    }
    return 0;
}
```



Merge Sort

```
#include<iostream>
#include<stdlib.h>
#include<omp.h>
using namespace std;

void mergesort(int a[], int i, int j);
void merge(int a[], int i1, int j1, int i2, int j2);

void mergesort(int a[], int i, int j)
{
    int mid;
    if (i < j)
    {
        mid = (i + j) / 2;

        #pragma omp parallel sections
        {
            #pragma omp section
            {
                mergesort(a, i, mid);
            }

            #pragma omp section
```

```
            {
                mergesort(a, mid + 1, j);
            }
        }
        merge(a, i, mid, mid + 1, j);
    }
}

void merge(int a[], int i1, int j1, int i2, int j2)
{
    int temp[1000];
    int i, j, k;
    i = i1;
    j = i2;
    k = 0;

    cout << "\nMerging: ";
    for (int x = i1; x <= j1; x++)
    {
        cout << a[x] << " ";
    }
    cout << "and ";
    for (int x = i2; x <= j2; x++)
    {
        cout << a[x] << " ";
    }
    cout << endl;

    while (i <= j1 && j <= j2)
    {
        if (a[i] < a[j])
        {
            temp[k++] = a[i++];
        }
        else
        {
            temp[k++] = a[j++];
        }
    }
    while (i <= j1)
    {
        temp[k++] = a[i++];
    }
    while (j <= j2)
    {
        temp[k++] = a[j++];
    }
    for (i = i1, j = 0; i <= j2; i++, j++)
    {
        a[i] = temp[j];
    }

    cout << "Result after merging: ";
```

```
    for (int x = i1; x <= j2; x++)
    {
        cout << a[x] << " ";
    }
    cout << endl;
}

int main()
{
    int *a, n, i;
    cout << "\nEnter size of Array : ";
    cin >> n;
    a = new int[n];
    cout << "\nEnter elements : \n";
    for (i = 0; i < n; i++)
    {
        cin >> a[i];
    }
    mergesort(a, 0, n - 1);
    cout << "\nSorted array is : ";
    for (i = 0; i < n; i++)
    {
        cout << a[i] << " ";
    }

    return 0;
}
```