

Assignment-I

Compile the following **merge sort program** to Intel x86 assembly language program using the command **cc -S mergeSort.c**. Write comments in the assembly language program

- explaining actions at every step and
- showing its connection with the C program.

The assembly language code should remain compilable after commenting.

mergeSort.c

```
#define SIZE 100
int m[SIZE], t[SIZE] ;
void CopyBackToBack(int low, int high, int mid) {
    int i ;
    for(i = mid ; i >= low ; t[i] = m[i--]);
    for(i = mid + 1 ; i <= high ;
        t[high + mid + 1 - i] = m[i++]);
}
void Merge(int low, int high) {
    int i, j, k ;
    i = low ; j = high ;
    for(k = low ; k <= high ; k++)
```

```
    if(t[i] < t[j]) m[k] = t[i++];
    else m[k] = t[j--];
}
void mergesort(int low, int high)
{
    int mid, i, j, k ;
    if(high > low) {
        mid = (high + low)/2;
        mergesort(low, mid);
        mergesort(mid + 1, high);
        CopyBackToBack(low, high, mid) ;
        Merge(low, high) ;
    }
}
```

```
int main() {
    int n, i;
    printf("Enter the number of data :") ;
    scanf("%d",&n);
    printf("\nEnter the data\n") ;
    for(i = 0 ; i < n ; scanf("%d", &m[i++]));
    mergesort(0,n-1);
    printf("The sorted data are\n") ;
    for(i = 0 ; i < n ; printf("%d ", m[i++]));
    printf("\n") ;
}
```