PROGRAM 17:

```c
#include <stdio.h>

void merge(int arr[], int p, int q, int r) {

  int n1 = q - p + 1;

  int n2 = r - q;

  int L[n1], M[n2];


  for (int i = 0; i < n1; i++)

    L[i] = arr[p + i];

  for (int j = 0; j < n2; j++)

    M[j] = arr[q + 1 + j];


  int i, j, k;

  i = 0;

  j = 0;

  k = p;


  while (i < n1 && j < n2) {

    if (L[i] <= M[j]) {

      arr[k] = L[i];

      i++;

    } else {

      arr[k] = M[j];

      j++;

    }

    k++;

  }
```

```c
  while (i < n1) {
    arr[k] = L[i];
    i++;
    k++;
  }

  while (j < n2) {
    arr[k] = M[j];
    j++;
    k++;
  }
}
void mergeSort(int arr[], int l, int r) {
  if (l < r) {
    int m = l + (r - l) / 2;

    mergeSort(arr, l, m);
    mergeSort(arr, m + 1, r);
    merge(arr, l, m, r);
  }
}
void printArray(int arr[], int size) {
  for (int i = 0; i < size; i++)
    printf("%d ", arr[i]);
  printf("\n");
}
int main() {
  int arr[] = {6, 5, 12, 10, 9, 1};
  int size = sizeof(arr) / sizeof(arr[0]);
```
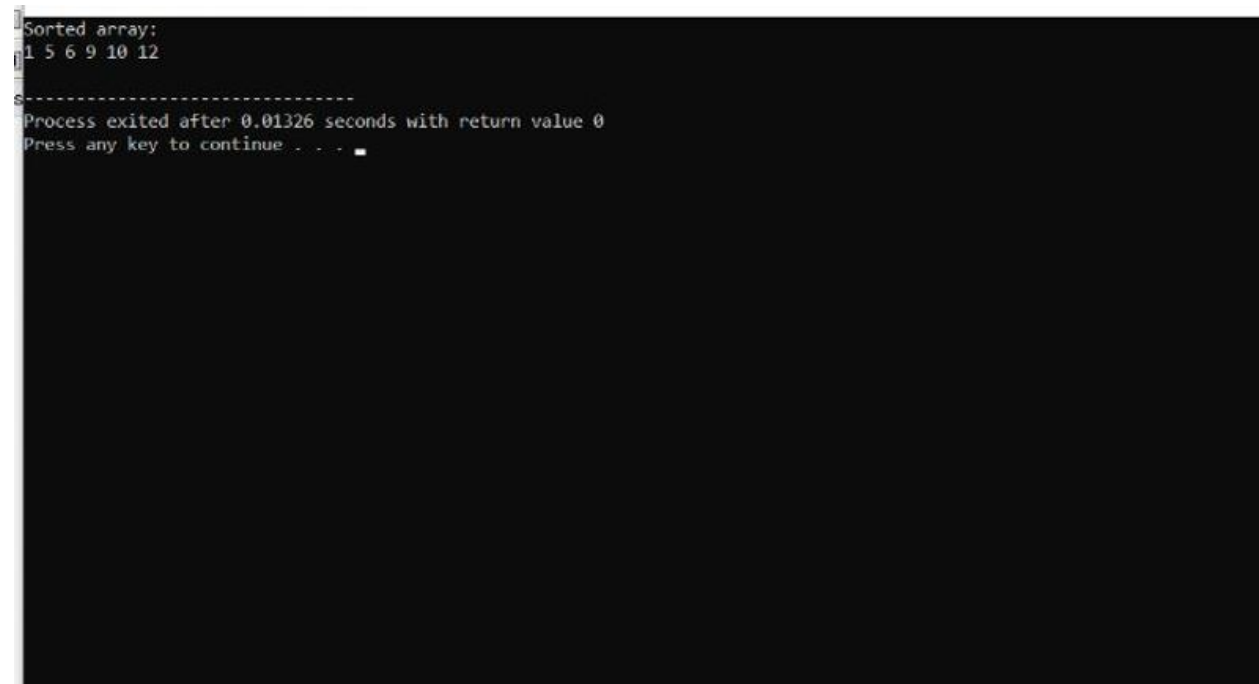
```
  mergeSort(arr, 0, size - 1);


  printf("Sorted array: \n");

  printArray(arr, size);
}
```

OUTPUT:

```
Sorted array:
1 5 6 9 10 12

s---------------------------------
Process exited after 0.01326 seconds with return value 0
Press any key to continue . . .
```