```
#include<stdio.h>
#include <stdlib.h>
#define MAX 25

void random_shuffle(int arr[])
{
   int i, j, temp;
   srand(time(NULL));
   for (i = MAX - 1; i > 0; i--) {
       j = rand()%(i + 1);
       temp = arr[i];
       arr[i] = arr[j];
       arr[j] = temp;
   }
}
void  max_heapify(int a[], int i, int heapsize)
{
   int tmp, largest;
   int l = (2 * i) + 1;
   int r = (2 * i) + 2;
   if ((l <= heapsize) && (a[l] > a[i]))
       largest = l;
   else
       largest = i;
   if ((r <= heapsize) && (a[r] > a[largest]))
       largest = r ;
   if (largest != i)
   {
       tmp = a[i];
       a[i] = a[largest];
       a[largest] = tmp;
```

```
        max_heapify(a, largest, heapsize);
    }

}
void  build_max_heap(int a[], int heapsize)
{
    int i;
    for (i = heapsize/2; i >= 0; i--)
    {
        max_heapify(a, i, heapsize);
    }

}
void heap_sort(int a[], int heapsize)
{
    int i, tmp;
    build_max_heap(a, heapsize);
    for (i = heapsize; i > 0; i--)
    {
        tmp = a[i];
        a[i] = a[0];
        a[0] = tmp;
        heapsize--;
        max_heapify(a, 0, heapsize);
    }
}
int main()
{
    int i, r, heapsize;
    int a[MAX];
    for (i = 0; i < MAX; i++)
```

```
    a[i] = i;
  heapsize = MAX - 1;
  random_shuffle(a);
  printf("\n");
  heap_sort(a, heapsize);
  for (i = 0; i < MAX; i++)
    printf("%d ", a[i]);
  return 0;
}
```