C Programming

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2.10.2012

Quick sorting

Quick sort is a divide and conquer algorithm. Its divided large list in mainly three parts:

1. Elements less than pivot element.
2. Pivot element.
3. Elements greater than pivot element.

Where pivot as middle element of large list. Let's understand through example:

List : 3 7 8 5 2 1 9 5 4

In above list assume **4** is pivot element so rewrite list as:

3 1 2 4 5 8 9 5 7

Here, I want to say that we set the **pivot element**(**4**) which has in left side elements are less than and right hand side elements are greater than. Now you think, how's arrange the less than and greater than elements? Be patient, you get answer soon.

Now let's start understand the concept of quick sort. The **steps are**:

1. Pick a pivot element.
2. Reorder the list so that all elements with values less than the pivot come before the pivot, while all elements with values greater than the pivot come after it (equal values can go either way). After this partitioning, the pivot is in its final position. This is called the **partition** operation.
3. **Recursively sort** the sub-list of lesser elements and the sub-list of greater elements.

The base case of the recursion are lists of size zero or one, which never need to be sorted

Example of quick sort process:

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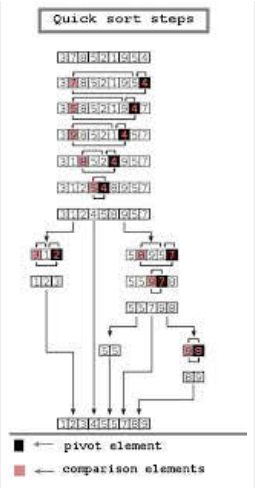


Steps of quick sorting

```
/*c program for quick sorting*/
#include<stdio.h>
#include<conio.h>
void qsort(int arr[20], int fst, int last);
int main()
{
 int arr[30];
 int i,size;
 printf("Enter total no. of the elements : ");
 scanf("%d",&size);
 printf("Enter total %d elements : \n",size);
 for(i=0; i<size; i++)
    scanf("%d",&arr[i]);
 qsort(arr,0,size-1);
 printf("Quick sorted elements are as  : \n");
 for(i=0; i<size; i++)
    printf("%d\t",arr[i]);
 getch();
 return 0;
}
void qsort(int arr[20], int fst, int last)
{
 int i,j,pivot,tmp;
 if(fst<last)
 {
   pivot=fst;
   i=fst;
   j=last;
   while(i<j)
   {
     while(arr[i]<=arr[pivot] && i<last)
        i++;
     while(arr[j]>arr[pivot])
        j--;
```

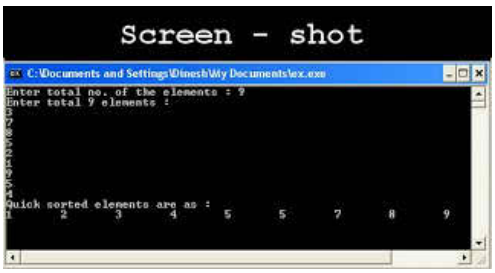
Automatic Storage Class
Storage classes
String triangle macro
Character structure
Number triangle equal
Character triangle equal
Character triangle
Pascal Triangle
► January (14)
► 2011 (101)

Popular Programs

Algorithms and Flowchart
Merge sorting
Pascal Triangle
Print prime number 1 to 100
Factorial C program,Algorithm,Flowchart
Flowchart for prime number
Heap sorting
Quick sorting
Shell sorting
call by reference swap program

```
        if(i<j)
        {
            tmp=arr[i];
            arr[i]=arr[j];
            arr[j]=tmp;
        }
    }
    tmp=arr[pivot];
    arr[pivot]=arr[j];
    arr[j]=tmp;
    qsort(arr,fst,j-1);
    qsort(arr,j+1,last);
  }
}
```

/******* OUTPUT **********/**



Screen-shot of quick sorting C program

Related programs:

1. Heap sorting method and algorithm
2. Heap sorting
3. Bubble sorting
4. Selection Sorting
5. Insertion sorting
6. Insertion sorting using function
7. Shell sorting
8. Merge sorting
9. Radix sorting
10. Liner sorting

Posted by Dinesh Bera

Labels: example of quick sorting in c, explanation of quick sorting in c, quick sorting in c, quick sorting steps

1 comment:

Jayesh Panchal 27 February 2013 at 20:43

Check out this version of QuickSort Algorithm :)

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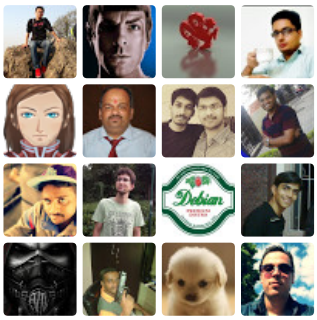

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