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17BIT0028

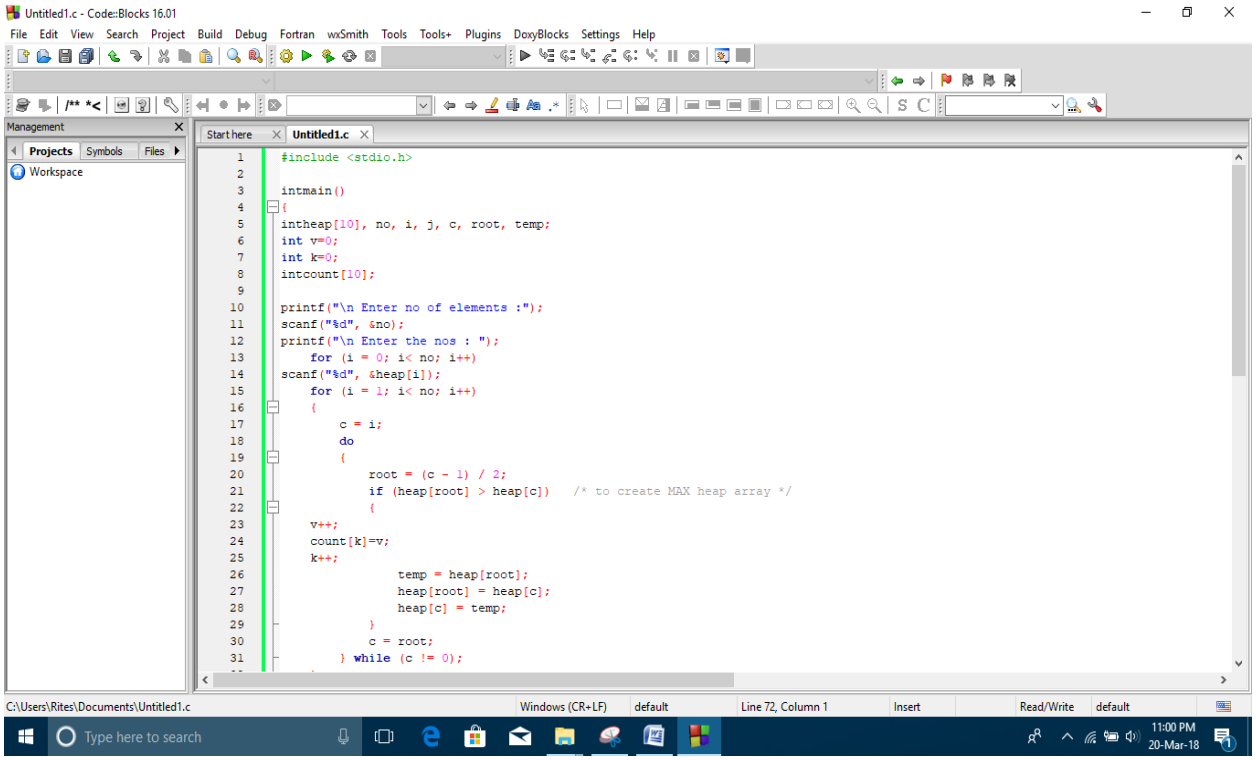
ITE – 1004

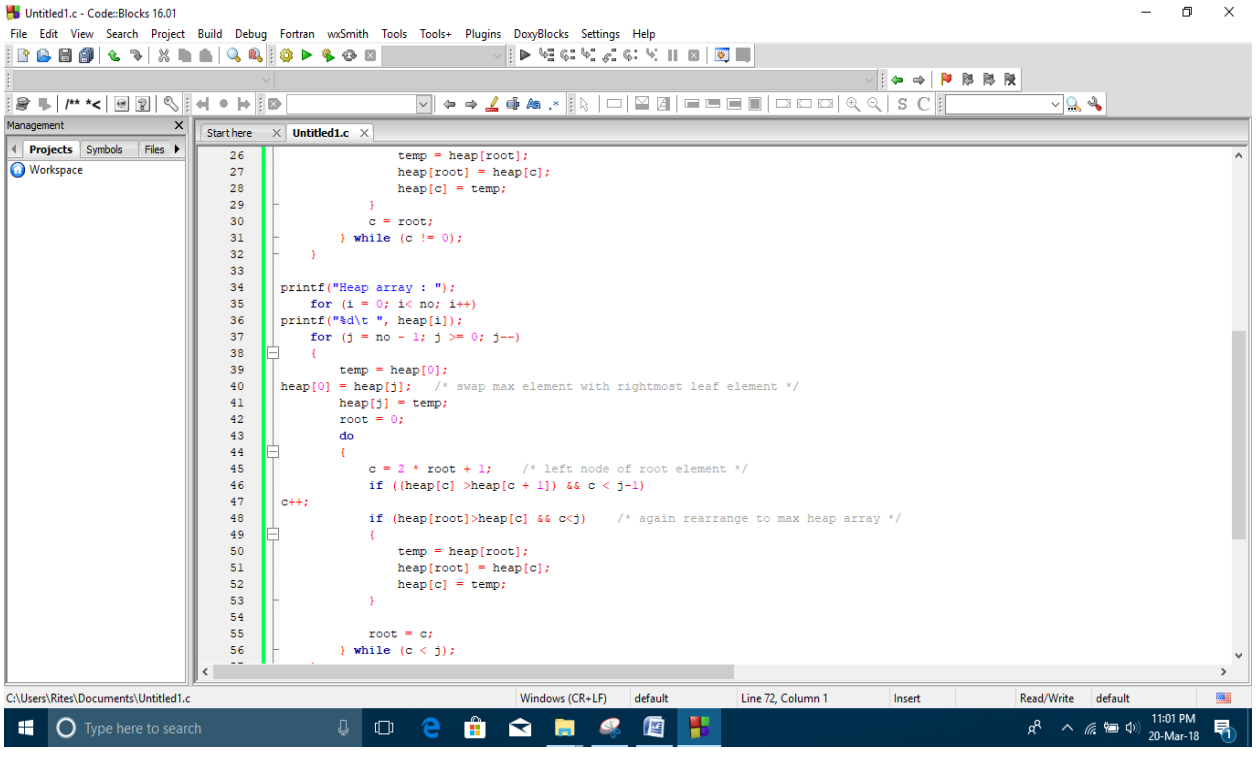
DATA STRUCTURES AND ALGORITHM

HEAP SORT

```
#include <stdio.h>


intmain()
{
intheap[10], no, i, j, c, root, temp;

int v=0;

int k=0;

intcount[10];

printf("\n Enter no of elements :");
scanf("%d", &no);

printf("\n Enter the nos : ");

    for (i = 0; i< no; i++)
scanf("%d", &heap[i]);

    for (i = 1; i< no; i++)
    {
        c = i;
        do
        {
            root = (c - 1) / 2;
            if (heap[root] > heap[c])   /* to create MAX heap array */
            {
      v++;
      count[k]=v;
      k++;
                temp = heap[root];
                heap[root] = heap[c];
                heap[c] = temp;
            }
            c = root;
        } while (c != 0);
    }
```

```
printf("Heap array : ");

for (i = 0; i< no; i++)
printf("%d\t ", heap[i]);

for (j = no - 1; j >= 0; j--)
    {
        temp = heap[0];
heap[0] = heap[j];   /* swap max element with rightmost leaf element
*/
        heap[j] = temp;
        root = 0;
        do
        {
            c = 2 * root + 1;    /* left node of root element */
            if ((heap[c] >heap[c + 1]) && c < j-1)
c++;
            if (heap[root]>heap[c] && c<j)    /* again rearrange to
max heap array */
            {
                temp = heap[root];
                heap[root] = heap[c];
                heap[c] = temp;
            }

            root = c;
        } while (c < j);
    }
printf("\n The sorted array is : ");
    for (i =0; i<no; i++)
printf("\t %d", heap[i]);
printf("\nthe number of swap in each method is:\n");
i=0;
    while(count[i]!=NULL)
    {
     printf("%d\n",count[i]);
     i++;
     }
    return 0;
}
```


Untitled1.c - Code::Blocks 16.01
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
Management
Projects Symbols Files
Workspace
Start here
Untitled1.c
#include <stdio.h>
intmain()
{
intheap[10], no, i, j, c, root, temp;
int v=0;
int k=0;
intcount[10];
printf("\n Enter no of elements :");
scanf("%d", &no);
printf("\n Enter the nos : ");
for (i = 0; i< no; i++)
scanf("%d", &heap[i]);
for (i = 1; i< no; i++)
{
c = i;
do
{
root = (c - 1) / 2;
if (heap[root] > heap[c]) /* to create MAX heap array */
{
v++;
count[k]=v;
k++;
temp = heap[root];
heap[root] = heap[c];
heap[c] = temp;
}
c = root;
} while (c != 0);
C:\Users\Rites\Documents\Untitled1.c
Windows (CR+LF)
default
Line 72, Column 1
Insert
Read/Write
default
Type here to search
11:00 PM
20-Mar-18


Untitled1.c - Code::Blocks 16.01
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Management
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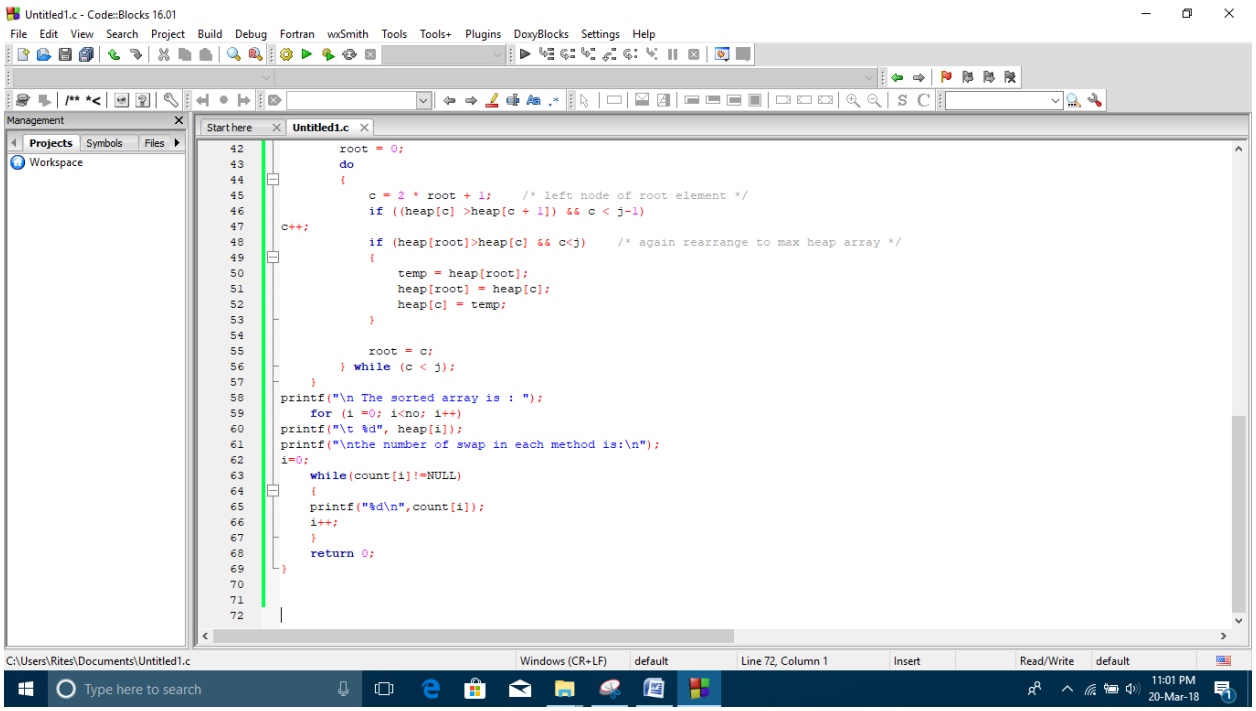
Untitled1.c
temp = heap[root];
heap[root] = heap[c];
heap[c] = temp;
}
c = root;
} while (c != 0);
}
printf("Heap array : ");
for (i = 0; i< no; i++)
printf("%d\t ", heap[i]);
for (j = no - 1; j >= 0; j--)
{
temp = heap[0];
heap[0] = heap[j]; /* swap max element with rightmost leaf element */
heap[j] = temp;
root = 0;
do
{
c = 2 * root + 1; /* left node of root element */
if ((heap[c] >heap[c + 1]) && c < j-1)
c++;
if (heap[root]>heap[c] && c<j) /* again rearrange to max heap array */
{
temp = heap[root];
heap[root] = heap[c];
heap[c] = temp;
}
root = c;
} while (c < j);
C:\Users\Rites\Documents\Untitled1.c
Windows (CR+LF)
default
Line 72, Column 1
Insert
Read/Write
default
Type here to search
11:01 PM
20-Mar-18



OUTPUT

```
Enter no of elements :10

Enter the nos : 1
2
3
4
5
6
7
8
9
0
Heap array : 0   1       3       4       2       6       7       8       9
5
 The sorted array is :   9       8       7       6       5       4       3
2       1       0
the number of swap in each method is:
1
2
3


...Program finished with exit code 0
Press ENTER to exit console.
```