LAB-7
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```c
#include<stdio.h>
#include<stdlib.h>
#include<conio.h>
#include<time.h>

clock_t start,end;
double cpu_time;

void heapadj(int a[], int n)
{
    int i,j,item;
    j=0;
    item=a[j];
    i=2*j+1;
    while(i<=n-1)
    {
        if(i+1<=n-1)
        {
            if(a[i]<a[i+1])
            {
            i++;
            }
        }
        if(item<a[i])
        {
            a[j]=a[i];
            j=i;
            i=2*j+1;
        }
        else
        {
            break;
        }
    }
    a[j]=item;
}

void heapcons(int a[], int n)
{
```

```c
    int i,j,k,item;
    for(k=1;k<n;k++)
    {
        item=a[k];
        i=k;
        j=(i-1)/2;
        while(i>0 && item>a[j])
        {
            a[i]=a[j];
            i=j;
            j=(i-1)/2;
        }
        a[i]=item;
    }
}

int heapsort(int a[], int n)
{
    int i,temp;
    heapcons(a,n);
    for(i=n-1;i>0;i--)
    {
        temp=a[0];
        a[0]=a[i];
        a[i]=temp;
        heapadj(a,i);
    }
}

int main()
{
    int n,i,a[10000];
    srand(time(0));
    printf("enter number of elements:\n");
    scanf("%d", &n);
    printf("Array elements:\n");
    for(i=0;i<n;i++)
    {
        a[i]=rand()%100;
        printf("%d ",a[i]);
    }
    start= clock();
    heapsort(a,n);
    printf("\nsorted array:\n");
```

```c
    for(i=0;i<n;i++)
    {
        printf("%d ",a[i]);
    }
    end = clock();
    cpu_time = (double)(end - start) / CLOCKS_PER_SEC;
    printf("\nExecution time for Heap sort = %f ms\n", cpu_time*1000);
    getch();
}
```

```
enter number of elements:
100
Array elements:
94 63 71 89 94 83 67 25 19 16 37 5 57 57 18 27 37 42 31 1 63 73 89 57 77 87 78 11 56 14 92 2 77 15 91 72 51 11 49 70 27 87 75
84 44 46 63 81 40 94 34 3 19 23 60 97 62 91 60 18 5 4 20 82 72 64 6 23 75 56 93 54 43 68 38 39 66 2 72 6 48 6 62 68 81 74 17 4
4 65 77 14 22 34 87 57 6 3 63 29 78
sorted array:
1 2 2 3 3 4 5 6 6 6 6 11 11 14 14 15 16 17 18 18 19 19 20 22 23 23 25 27 27 29 31 34 34 37 37 38 39 40 42 43 44 44 46 48 49
51 54 56 56 57 57 57 57 60 60 62 62 63 63 63 64 65 66 67 68 68 70 71 72 72 72 73 74 75 75 77 77 77 78 78 81 81 82 83 84 87
87 87 89 89 91 91 92 93 94 94 94 97
Execution time for Heap sort = 0.033000 ms


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