

INSERTION SORT PROGRAM

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#include <math.h>
#include <stdio.h>
#include <time.h>

void insertionSort(int arr[], int n)
{
    int i, key, j;
    for (i = 1; i < n; i++) {
        key = arr[i];
        j = i - 1;

        while (j >= 0 && arr[j] > key) {
            arr[j + 1] = arr[j];
            j = j - 1;
        }
        arr[j + 1] = key;
    }
}

int main()
{
    int n;
    clock_t start, end;
    double cpu time taken;
```

```

clock_t start,end;
double cpu_time_taken;
printf("enter no of elements\n");
scanf("%d",&n);
int arr[n] ;
printf("chosen array is:");
for (int i = 0; i < n; i++)
{
    arr[i]=rand()%100;

    printf("%d\t",arr[i]);

}
printf("\n");
start=clock();
insertionSort(arr, n);
for (int c = 1; c <= 8000; c++) for (int d = 1; d <= 8000; d++) { }
end = clock();
cpu_time_taken = (double)(end - start) / CLOCKS_PER_SEC;
printf("sorted array is:");
for (int i = 0; i < n; i++)
    printf("%d\t ", arr[i]);
printf("\n");
printf("time spent: %f sec\n",cpu_time_taken);
}

```

OUTPUT:-

```

enter no of elements
100
chosen array is:83      86      77      15      93      35      86      92      49      21      62      27      90      59      63      26
      40      26      72      36      11      68      67      29      82      30      62      23      67      35      29      2      22
      58      69      67      93      56      11      42      29      73      21      19      84      37      98      24      15      70
29      13      26      91      80      56      73      62      70      96      81      5      25      84      27      36      5      46
      13      57      24      95      82      45      14      67      34      64      43      50      87      8      76      78      88
      84      3      51      54      99      32      60      76      68      39      12      26      86      94      39      21      21
sorted array is:2      3      5      5      8      11      11      12      13      13      14      15      15      19      21      21
      22      23      24      24      25      26      26      26      27      27      29      29      29      29      30      32
      34      35      35      36      36      37      39      39      40      42      43      45      46      49      50      51      54
      56      56      57      58      59      60      62      62      63      64      67      67      67      67      68      68      8
69      70      70      72      73      73      76      76      77      78      80      81      82      82      83      84      84      8
4      86      86      86      87      88      90      91      92      93      93      93      94      95      96      98      99
time spent: 0.140651 sec

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

```