

```

runner% cat sort_select.c
#include <stdio.h>
#include <stdlib.h>
#include <time.h>
#define M 100
void inita(void);
void check_sorted(void);
void sort_select(int n);
int maxind(int);
void swap(double *, double *);
double a[M];

void main(void)
{
    int starttime, stoptime; /* elapsed time */
    int startclock, stopclock; /* CPU time */
    srand48((Long)time(NULL));
    inita();
    starttime = time(NULL); startclock = clock();
    sort_select(M-1);
    stoptime = time(NULL); stopclock = clock();
    printf("Sorting %i numbers\n", M);
    printf("Elapsed time: %ld seconds\n",
           stoptime - starttime);
    printf("CPU time: %.3f seconds\n",
           (double)(stopclock - startclock)/1000000.0);
    check_sorted();
}

void sort_select(int n)
{
    int maxi;
    if (n > 0) {
        maxi = maxind(n);
        swap(&a[maxi], &a[n]);
        sort_select(n-1);
    }
}

int maxind(int m)
{
    int maxi;
    if (m == 0) return m;
    maxi = maxind(m-1);
    if (a[m] > a[maxi]) return m;
    return maxi;
}

void swap(double *x, double *y)
{
    double z = *x;
    *x = *y;
    *y = z;
}

```

```

void inita(void)
{
    int i;
    for (i = 0; i < M; i++)
        a[i] = drand48();
}

void check_sorted(void)
{
    int sorted = 1;
    int i;
    for (i = 0; i < M-1; i++)
        if (a[i] > a[i+1]) sorted = 0;
    if (sorted) printf("Array sorted\n");
    else printf("*** Array NOT sorted\n");
}

runner% sort_select
Sorting 100 numbers
Elapsed time: 0 seconds
CPU time: 0.010 seconds
Array sorted
runner% sort_select
Sorting 500 numbers
Elapsed time: 0 seconds
CPU time: 0.340 seconds
Array sorted
runner% sort_select
Sorting 1000 numbers
Elapsed time: 2 seconds
CPU time: 1.520 seconds
Array sorted
runner% sort_select
Sorting 5000 numbers
Elapsed time: 41 seconds
CPU time: 40.560 seconds
Array sorted
runner% sort_select
Sorting 10000 numbers
Elapsed time: 167 seconds
CPU time: 165.650 seconds
Array sorted
runner% sort_select
Sorting 20000 numbers
Elapsed time: 889 seconds
CPU time: 868.100 seconds
Array sorted

```