#include<stdio.h>

#include<time.h>

#include<stdlib.h>

void swap(int\* a, int\* b)

{

int t = \*a;

\*a = \*b;

\*b = t;

}

int partition (int arr[], int low, int high)

{

int pivot = arr[high];

int i = (low - 1);

for (int j = low; j <= high- 1; j++)

{

if (arr[j] < pivot)

{

i++;

swap(&arr[i], &arr[j]);

}

}

swap(&arr[i + 1], &arr[high]);

return (i + 1);

}

void quickSort(int arr[], int low, int high)

{

if (low < high)

{

int pi = partition(arr, low, high);

quickSort(arr, low, pi - 1);

quickSort(arr, pi + 1, high);

}

}

void printArray(int arr[], int size)

{

int i;

for (i=0; i < size; i++)

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

printf("\n");

}

int main()

{

int arr[15000],size,i,j,ch,temp;

clock\_t start,end;

while(1)

{

printf("\n1: For manual entry of N value and array elements.");

printf("\n2: To display time taken for sorting number of elements N in the range 500 to 14500.");

printf("\n3: To exit from the program.");

printf("\nEnter your choice:");

scanf("%d",&ch);

switch(ch)

{

case 1:printf("Enter size of array: \n");

scanf("%d",&size);

printf("Enter the elements to sort in the array: \n");

for(i=0;i<size;i++)

scanf("%d",&arr[i]);

start=clock();

quickSort(arr, 0, size-1);

end=clock();

printf("Sorted array: ");

printArray(arr,size);

printf("\n Time taken to sort %d numbers is %f secs.\n",size,(((double)(end-start))/CLOCKS\_PER\_SEC));

break;

case 2: size=500;

while(size<=14500)

{

for(i=0;i<size;i++)

{

arr[i]=size-i;

}

start=clock();

quickSort(arr, 0, size-1);

//Dummy loop to create delay

for(j=0;j<500000;j++)

{

temp=38/600;

}

end=clock();

printf("\n Time taken to sort %d numbers is %f secs.\n",size,(((double)(end-start))/CLOCKS\_PER\_SEC));

size=size+1000;

}

break;

case 3:

exit(0);

break;

}

}

return 0;

}

