#include <iostream>

#include <cstring>

#include <ctime>

#include <cstdlib>

#include <algorithm>

const int MAXN = 10000000+10;

using namespace std;

int A[MAXN];

int n;

void quicksort(int \*A,int l,int r){//sort number in array A

if(r<=l)return;//if r-l<=1 then return

swap(A[rand()%(r-l)+l+1],A[l]);

int mid=(l+r)>>1,cmp=A[l],loc=l;

for(int i=l+1;i<=r;i++)//use for loop to realize qsort

if(A[i]<cmp || (A[i]==cmp && loc<mid)){

loc++;

if(i!=loc)swap(A[i],A[loc]);

}

quicksort(A,l,loc-1);

quicksort(A,loc+1,r);

}

int main(){

srand(time(NULL));

n=1000000;

//n=100;

for(int i=0;i<n;i++)A[i]=rand();

//for(int i=0;i<n;i++)cout<<A[i]<<" ";cout<<endl;

quicksort(A,0,n-1);

//for(int i=0;i<n;i++)cout<<A[i]<<" ";cout<<endl;

return 0;

}