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Report: HW4

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Description:

How do you finish this homework?

只有浮點數亂數是查網路，其他都參考課本

What did you learned from this homework?

再一次讓我了解command line argument如何使用,還有亂數的使用方法,

並利用function使main的程式碼看起來更簡潔

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Code:

//學號：F74042086

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//編譯方式：gcc -o hw4 hw4.c

//執行方式：./hw4 (n個數字) (0為整數 1為浮點數)

//程式功能：randomly generate n integers or n floating numbers and sorted in descending order

//更新日期：2015.11.6

#include <stdio.h>

#include <stdlib.h>

#include <time.h>

#include <string.h>

int spilt\_prime(float a[], int low, int high); //浮點數的快速排序法

void quicksort\_prime(float a[], int low, int high);

int spilt(int a[], int low, int high); //整數的快速排序法

void quicksort(int a[], int low, int high);

void generatefloat(float a[], int n); //隨機浮點數產生器

void generateint(int a[], int n); //隨機整數產生器

int main(int argc, char \*argv[])

{

if (argc != 3)

exit(1);

int n = atoi(argv[1]);

int int\_float = (int)\*argv[2] - 48;

int i;

if(int\_float == 0)

{

int array[n];

generateint(array,n);//將產生的整數亂數存入陣列

quicksort(array, 0, n - 1);

printf("in sorted order:\n");

for(i = n - 1 ; i > -1; i--)

printf("%d\n",array[i]);

printf("\n");

}

else if(int\_float == 1)

{

float array[n];

generatefloat(array,n);//將產生的浮點數亂數存入陣列

quicksort\_prime(array, 0, n - 1);

printf("in sorted order:\n");

for(i = n - 1 ; i > -1; i--)

printf("%f\n",array[i]);

printf("\n");

}

else exit(1); //如果輸入格式錯誤則跳出程式

return 0;

}

void generateint(int a[], int n)

{

srand((unsigned) time(NULL));

int i,temp;

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

{

temp = rand() % 10001;

a[i] = temp;

}

}

void generatefloat(float a[], int n)

{

srand((unsigned) time(NULL));

int i;

float temp;

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

{

temp =(float)10000 \* rand()/((float)RAND\_MAX);

a[i] = temp;

}

}

void quicksort(int a[], int low, int high)

{

int middle;

if(low >= high) return;

middle = spilt(a, low, high);

quicksort(a, low, middle - 1);

quicksort(a, middle + 1, high);

}

int spilt(int a[], int low, int high)

{

int part\_element = a[low];

for(;;)

{

while(low < high && part\_element <= a[high])

high--;

if(low >= high) break;

a[low++] = a[high];

while(low < high && a[low] <= part\_element)

low++;

if(low >= high) break;

a[high--] = a[low];

}

a[high] = part\_element;

return high;

}

void quicksort\_prime(float a[], int low, int high)

{

float middle;

if(low >= high) return;

middle = spilt\_prime(a, low, high);

quicksort\_prime(a, low, middle - 1);

quicksort\_prime(a, middle + 1, high);

}

int spilt\_prime(float a[], int low, int high)

{

float part\_element = a[low];

for(;;)

{

while(low < high && part\_element <= a[high])

high--;

if(low >= high) break;

a[low++] = a[high];

while(low < high && a[low] <= part\_element)

low++;

if(low >= high) break;

a[high--] = a[low];

}

a[high] = part\_element;

return high;

}

Compilation:

gcc -o hw4 hw4.c

Execution:

./hw4 (n個數字) (0為整數 1為浮點數)

Output:

F74042086@c-2015-1:~/hw4> ./hw4 5 0

in sorted order:

9637

8906

3095

2506

369

F74042086@c-2015-1:~/hw4> ./hw4 11 1

in sorted order:

9922.062500

9533.723633

7940.795410

6296.736816

2589.290039

1459.432129

1364.615234

1348.943115

1337.223511

592.083557

359.616669

Error message:

hw4.c:9:3: warning: incompatible implicit declaration of built-in function ‘exit’ [enabled by default]

exit(1);

hw4.c: In function ‘quicksort\_prime’:

hw4.c:129:2: warning: passing argument 1 of ‘quicksort’ from incompatible pointer type [enabled by default]

quicksort(a, low, middle - 1);

^

hw4.c:92:6: note: expected ‘int \*’ but argument is of type ‘float \*’

void quicksort(int a[], int low, int high)

^

hw4.c:130:2: warning: passing argument 1 of ‘quicksort’ from incompatible pointer type [enabled by default]

quicksort(a, middle + 1, high);

^

hw4.c:92:6: note: expected ‘int \*’ but argument is of type ‘float \*’

void quicksort(int a[], int low, int high)

^