机考测试报告

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**【测试代码】**

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#include <stdio.h>

#include <stdlib.h>

#include <time.h>

#define N 20

#define MAXX 99

void sort\_bubble( int array[] , const int arraySize );

//按照升序排序

void swap( int \*x , int \*y );

//交换两个数

void setRandomArray( int \*x , const int size );

//随机生成数列

void displayArray( int \*x , const int size );

//打印数列

void displayResult( int \*x , const int size , int \*foundNum );

void printArrayWithSameDifference( int start , int differ , int counter);

int main ( void )

{

srand(time(NULL));

int array[N];

setRandomArray( array , N );

printf("Before Sort:\n");

displayArray( array , N );

sort\_bubble( array , N );

printf("After Sort:\n");

displayArray( array , N );

int foundNum = 0;

displayResult(array , N , &foundNum );

printf("foundNum = %d \n" , foundNum);

return 0;

}

void swap( int \*x , int \*y )

{

int temp = \*x;

\*x = \*y;

\*y = temp;

}

void sort\_bubble( int array[] , const int arraySize )

{

int i , j , isSwapped;

//记录是否进行交换

for( i = 1 ; i < arraySize ; i ++ )

{

isSwapped = 0;

for( j = 0 ; j < arraySize - i ; j++ )

{

if(array[j] > array[j+1])

{

swap(array+j , array+j+1);

isSwapped = 1;

}

}

if( !isSwapped )

{

break;

}

}

}

void setRandomArray( int \*x , const int size )

{

int i;

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

{

\*( x + i ) = rand() % MAXX + 1;

}

}

void displayArray( int \*x , const int size )

{

int i ;

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

{

printf("%2d " , \*(x + i) );

}

printf("\n");

}

void displayResult( int \*x , const int size , int \*foundNum )

{

int i , j , k , counter , differ ;

//counter 记录项数

//differ 记录公差

for( i = 0 ; i < size - 2 ; i ++ )

{

if( i > 0 && \*(x + i) == \*(x + i - 1) )

{

continue;

}

//如果第一项已经遍历过了就跳过，以免重复

for( j = i + 1 ; j < size - 1 ; j ++ )

{

if( j > i + 1 && \*(x + j) == \*(x + j - 1) )

{

continue;

}

differ = \*(x + j) - \*(x + i);

counter = 2;

for( k = j + 1 ; k < size ; k ++ )

{

if(\*(x + k ) == \*(x + i) + differ \* counter )

{

counter++;

(\*foundNum)++;

printf("[%02d]:" , \*foundNum);

printArrayWithSameDifference(\*(x + i) , differ , counter );

}

}

}

}

}

void printArrayWithSameDifference( int start , int differ , int counter)

{

int i;

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

{

printf("%2d " , start + differ \* i);

}

printf("\n");

}

**【测试过程】**

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| 序号 | 测试任务 | 测试方法 | 测试结果 | 测试结论 |
| 1 | 测试setRandomArray函数，考察其能否随机生成数列 | 随机生成3次观察结果是否相同，并观察其是否在范围以内 |  | 测试通过 |
| 2 | 测试sort\_bubble函数，考察其能否将数列进行排序 | 随机生成3次观察结果是否是升序 |  | 测试通过 |
| 3 | 测试displayResult函数，考察其能否找到所有的等差数列并通过指针返回找到的个数 | 随机生成3次观察结果是否正确 |  | 测试通过 |

**【测试结论】**

该题所有要求都完成