**Project 11 归并排序**

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| 题号 | 程序逻辑(40) | 算法新颖性(20) | 代码规范  (20) | 实验报告(20) | 总分 |
| 得分 |  |  |  |  |  |

1. **问题描述**

对于任一无序正整数序列，写一程序用归并排序算法将其排序成按值非递减有序序列。

**2. 算法描述**

**#include <stdlib.h>**

**#include <stdio.h>**

**void Merge(int sourceArr[], int tempArr[], int startIndex, int midIndex, int endIndex) {**

**int i = startIndex, j = midIndex+1, k = startIndex;**

**while(i!=midIndex+1 && j!=endIndex+1) {**

**if(sourceArr[i] >= sourceArr[j])**

**tempArr[k++] = sourceArr[i++];**

**else**

**tempArr[k++] = sourceArr[j++];**

**}**

**while(i != midIndex+1)**

**tempArr[k++] = sourceArr[i++];**

**while(j != endIndex+1)**

**tempArr[k++] = sourceArr[j++];**

**for(i=startIndex; i<=endIndex; i++)**

**sourceArr[i] = tempArr[i];**

**}**

**//内部使用递归**

**void MergeSort(int sourceArr[], int tempArr[], int startIndex, int endIndex) {**

**int midIndex;**

**if(startIndex < endIndex) {**

**midIndex = (startIndex + endIndex) / 2;**

**MergeSort(sourceArr, tempArr, startIndex, midIndex);**

**MergeSort(sourceArr, tempArr, midIndex+1, endIndex);**

**Merge(sourceArr, tempArr, startIndex, midIndex, endIndex);**

**}**

**}**

**int main(void) {**

**int i=0, flag=1, totalNum=0;**

**FILE \*fp = fopen("input.txt", "r");**

**FILE \*fq = fopen("output.txt", "w");**

**while(fscanf(fp, "%d", &totalNum) && totalNum != -1) {**

**int array[totalNum], tempArray[totalNum];**

**for(i=0; i < totalNum; i++)**

**fscanf(fp, "%d", &array[i]);**

**MergeSort(array, tempArray, 0, totalNum-1);**

**fprintf(fq, "Case %d: %d\n", flag++, totalNum);**

**while(--totalNum >= 0)**

**fprintf(fq, "%d ", array[totalNum]);**

**fputs("\n", fq); //换行**

**}**

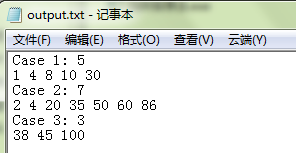
**fclose(fp);**

**fclose(fq);**

**return 0;**

**}**

**3.测试结果**



**4. 分析与评论**

没有具体要求怎么写，代码比较灵活，易操作性。