算法hw6

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Q1:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | 0 | 1 | 2 | 3 | 4 | 5 |  |
| next | -1 | 0 | 0 | 0 | 1 | 2 |  |
| T【i】 | A | C | E | B | E | A | TRUE |
| P【j】 | A | C | C | A | A | A | TRUE |
| i | 1 | 7 | 11 | 12 | 13 | 14 | TRUE |
| j | 0 | 2 | 2 | 0 | 0 | 0 | TRUE |

Q2：

|  |  |  |  |
| --- | --- | --- | --- |
| 平均时间(ticks) | | | |
|  | 10,000 | 100,000 | 1,000,000 |
| 快排 | 655 | 4716 | 42052 |
| 线性选择 | 1440 | 18167 | 207868 |

代码：

int Partition(int a[],int p,int r,int x) //快速排序一趟划分

{

int i = p-1,j = r + 1;

while(true)

{

while(a[++i]<x && i<r);

while(a[--j]>x);

if(i>=j)

{

break;

}

Swap(a[i],a[j]);

}

return j;

}

int Select(int a[],int p,int r,int k)

{

if(r-p<75)

{

BubbleSort(a,p,r);

return a[p+k-1];

}

//(r-p-4)相当于n-5

for(int i=0; i<=(r-p-4)/5; i++)

{

//每五个一组

BubbleSort(a,p+5\*i,p+5\*i+4);

Swap(a[p+5\*i+2],a[p+i]);

}

//找中位数的中位数

int x = Select(a,p,p+(r-p-4)/5,(r-p-4)/10);

int i = Partition(a,p,r,x);

int j = i-p+1;

if(k<=j) //看是否是要找的数，否则递归

{

return Select(a,p,i,k);

}

else

{

return Select(a,i+1,r,k-j);

}

}