1-4 Open Topic-2

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谢乃容

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problem A

simulate the following using "if..then..(without else)" and "goto"

(A) (A.1) if..then..else
(A.2) while
(A.3) do..while
(A.4) repeat..until

if..then..else

```
if (A){
    clauses_true;
}else{
    clauses_false;
}

//====>

bool flagB=true;
if (A){
    clauses_true;
    flagB=false;
}
if (flagB){
    clauses_false;
}
```

while

```
while (A){
    clauses;
}

//=====>

Label1:
    if (A){
        clauses;
        goto Label1;
    }
```

do..while

```
do{
    clauses;
}
while (A);

//=====>

Label1:
    clauses;
    if (A){
        goto Label1;
    }
```

repeat..until

```
do{
    clauses;
}
while (not A);

//=====>

Label1:
    clauses;
    if (not A){
        goto Label1;
    }
```

problem B

simulate the following using "if..then.." and "goto"

(B) do the following $N-1$ times:

- (B.1) point to the first element;
- (B.2) do the following $N-1$ times:
  - (B.2.1) compare the element pointed to with the next element;
  - (B.2.2) if the compared elements are in the wrong order, exchange them;
  - (B.2.3) point to the next element.

initialize-head

```
#include<cstdio>
using namespace std;
int input();
int output();
int sort(int *arr,int tot);
int exchange(int *a,int *b);
int sequence[100000]={},n=0;
```

initialize-main

```
int main()
{
    input();
    sort(sequence,n);
    output();
    return 0;
}
```

initialize-input

```
int input()
{
    scanf("%d",&n);
    for (int i=0;i<n;++i)
    {
        scanf("%d",&sequence[i]);
    }
    return 0;
}
```

initialize-output

```
int output()
{
    for (int i=0;i<n;++i)
    {
        printf("%d ",sequence[i]);
    }
    return 0;
}
```

initialize-exchange

```
int exchange(int *a,int *b)
{
    int temp;
    temp=*a;
    *a=*b;
    *b=temp;
    return 0;
}
```

bubble-sort-original

```
int sort(int *arr,int tot)
{
    for (int i=0;i<tot-1;++i)
    {
        for (int j=0;j<tot-1;++j)
        {
            if (arr[j]<arr[j+1])
            {
                exchange(&arr[j],&arr[j+1]);
            }
        }
    }
    return 0;
}
```

original-to-simulated

```
for (int i=0;i<n;++i)
{
    clause1;
    clause2;
    ...
}
//--->
int i=0;
Loop:
    if (i<n)
    {
        clause1;
        clause2;
        ...
        ++i;
        goto Loop;
    }
```

bubble-sort-simulated

```
int sort(int *arr,int tot){
    int i=0;
    Loop1:
        if (i<tot-1){
            int j=0;
            Loop2:
                if (j<tot-1){
                    if (arr[j]<arr[j+1]){
                        exchange(&arr[j],&arr[j+1]);
                    }
                    j++;
                    goto Loop2;
                }
                i++;
            goto Loop1;
        }
    return 0;
}
```


Thank
You!