

Problems for Week 4

Problem: 1 – Rearrangement of Array

Harish got a task to shift the values of array under given condition that the last element of array should get replaced with first element of array and all the other elements must shift to their left index by one position only.

Input format

Given the value of 'n' an array of size 'n' as input in two separate lines

Constraints

$1 \leq n \leq 20$

Output format

Provide the rearranged array in output.

Test Cases: (4,1 2 3 4: 2 3 4 1), (3, 5 8 7: 8 7 5), (1, 1 : 1), (5, 9 8 7 6 5: 8 7 6 5 9)

Solution:

```
int temp,array[20],n,i;
cin>>n;
for(i=0;i<n;i++){
    cin>>array[i];
}
temp=array[0];
for(i=0;i<n;i++){
    array[i]=array[i+1];
}
array[n]=temp;
```

Problem 2: First Even Pair

Aakanksha got the task to find the first even pair in the array. Even pair signifies the two consecutive even numbers inside the array.

Note: If there are two consecutive even elements present at index k & $(k+1)$, form an even pair.

Input format

Given the value of 'n' an array of size 'n' as input in two separate lines

Constraints

$1 \leq n \leq 20$

Output format

Print the index of first element of pair.

Test Cases: (4, 1 2 4 4: 1), (3, 6 4 7: 0), (5, 5 6 1 2 4 : 3), (4, 9 5 4 2: 2)

Solution:

```
#include <iostream>
using namespace std;
int main() {
    int array[20],n,i;
    cin>>n;
    for(i=0;i<n;i++){
        cin>>array[i]; }

    for(i=0;i<n;i++){
        if((array[i]%2)==0 && (array[i+1]%2)==0){
            cout<<i;break;} }
    return 0; }
```

Problem 3: Array Palindrome Problem

Priyanka got an array as input and assigned a task to verify that the reversal of array gives the same array or not. If array and its reverse version both are same then print “ Verified” else print “ Not Verified”.

Input format

Given the value of ‘n’ an array of size ‘n’ as input in two separate lines

Constraints

$1 \leq n \leq 20$

Output format

Print the output as Verified or Not Verified.

Test Cases: (4, 1 2 2 1: Verfied), (3, 6 4 7: Not Verified), (5, 1 8 5 8 1: Verified), (4, 9 5 4 2: Not Verified)

Solution:

```
#include <iostream>
#include <string>
using namespace std;

int main(){
    int i,n,low,high,arr[20],swap=0;
    cin>>n;
    for(i=0;i<n;i++){
        cin>>arr[i]; }
    low=0;high=n-1;
    while(low<high){
        if(arr[low]==arr[high]){
            low++;
            high--;
        }else{ swap=1; break;} }
    if(swap==1)cout<<"Not Verified";
    else cout<<"Verified";
    return 0;}
```

Problem 4: Set of Consecutive 1's

Arjun was working on a research paper based on binary number system. He designed an algorithm to find maximum number of consecutive set bits in the binary array.

Binary array is an array that contains only 0's & 1's.

Input format

Given the value of 'n' an array of size 'n' as input in two separate lines

Constraints

$1 \leq n \leq 20$

Output format

Print the integer output.

Test Cases: (4, 0 0 0 0: 0), (3, 1 0 1: 1), (5, 1 0 0 1 1: 2), (4, 0 1 1 1: 3)

Solution:

```
#include <iostream>
using namespace std;

int max(int a, int b){
    return (a>b?a:b);}

int main(){
    int res=0,i,n,arr[20],curr=0;
    cin>>n;
    for(i=0;i<n;i++){
        cin>>arr[i]; }
    for(i=0;i<n;i++){
        if(arr[i]==0) curr=0;
        else {curr++; res=max(res,curr);}
    }
    cout<<res;
    return 0;}
```

Problem 5: Share Market Problem

Akhil did MBA in finance and he is very much interested in buying & selling stocks. He knows the price of a stock for the upcoming 'n' days. To maximize the profit he can sell or buy the stock any day. We need to help him to maximize the profit.

Input format

Given the value of 'n' an array of size 'n' as input in two separate lines

Constraints

$1 \leq n \leq 20$

Output format

Print the maximum earned profit.

Test Cases: (4, 2 8 1 5: 10), (3, -3 8 4: 11), (5, 1 6 -2 6 9: 16), (4, 0 -1 5 4: 6)

Solution:

```
#include <iostream>
using namespace std;

int main()
{
    int arr[20],i,profit=0,n;
    cin>>n;
    for(i=0;i<n;i++){
        cin>>arr[i];}
    for(i=1;i<n;i++){
        if(arr[i]>arr[i-1])
            profit+=arr[i]-arr[i-1];
    }

    cout<<profit;
    return 0; }
```

Problem 6: Go Back-N Protocol

Aryan loves Computer Network and he wants to learn about the implementation of Go Back-N protocol. He took a set of integer and a variable 'k' and decided to find the maximum possible sum of 'k' consecutive elements from the set of integers.

Input format

Given the value of 'k', 'n' and an array of size 'n' as input in 3 separate lines

Constraints

$1 \leq k \leq 20$

$1 \leq n \leq 20$

Output format

Print the maximum obtained sum

Test Cases: (2,4, 2 8 1 5: 10), (3, 5, -3 8 -4 14 5: 18), (3,5, 1 6 -2 6 9: 13), (2,4, 0 -1 5 4: 9)

Solution:

```
#include <iostream>
using namespace std;

int main() {
    int curr_sum=0,i,n,k,max_sum=0,arr[20];
    cin>>k;  cin>>n;
    for(i=0;i<n;i++) {
        cin>>arr[i];  }
    for(i=0;i<k;i++) {
        curr_sum+=arr[i]; }
    max_sum=curr_sum;
    for(i=k;i<n;i++) {
        curr_sum+=arr[i]-arr[i-k];
        max_sum=(curr_sum>max_sum?curr_sum:max_sum); }
    cout<<max_sum;
    return 0;  }
```

Problem 7: Tracing Arrays

Tushar just started coding in school. He took a lecture of array and allotted a task to find the sum of first 3 elements of an array. Please help him out.

Input format

Given the value of 'n' and an array of size 'n' as input in 2 separate lines.

Constraints

$1 \leq n \leq 20$

Output format

Print the obtained sum

Test Cases: (4, 2 8 1 5: 11), (5, -3 8 -4 14 5: 1), (5, 1 6 -2 6 9: 5), (4, 0 1 5 4: 6)

Solution:

```
#include <iostream>
```

```
using namespace std;
```

```
int main()
```

```
{
```

```
    int i,n,sum=0,arr[20];
```

```
    cin>>n;
```

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

```
        cin>>arr[i];
```

```
        if(i<3) sum+=arr[i];
```

```
    }
```

```
    cout<<sum;
```

```
    return 0;
```

```
}
```