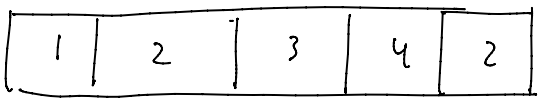
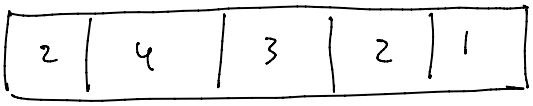
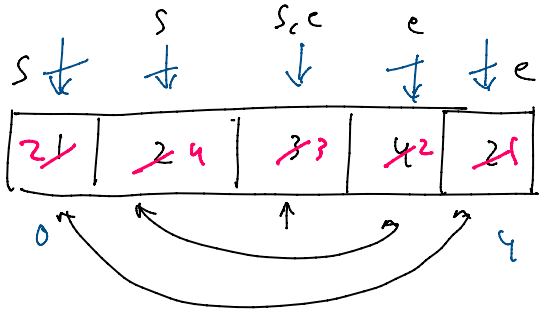
(1) Reverse an Array





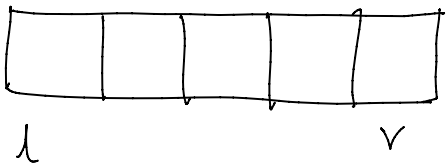
Naive Approach



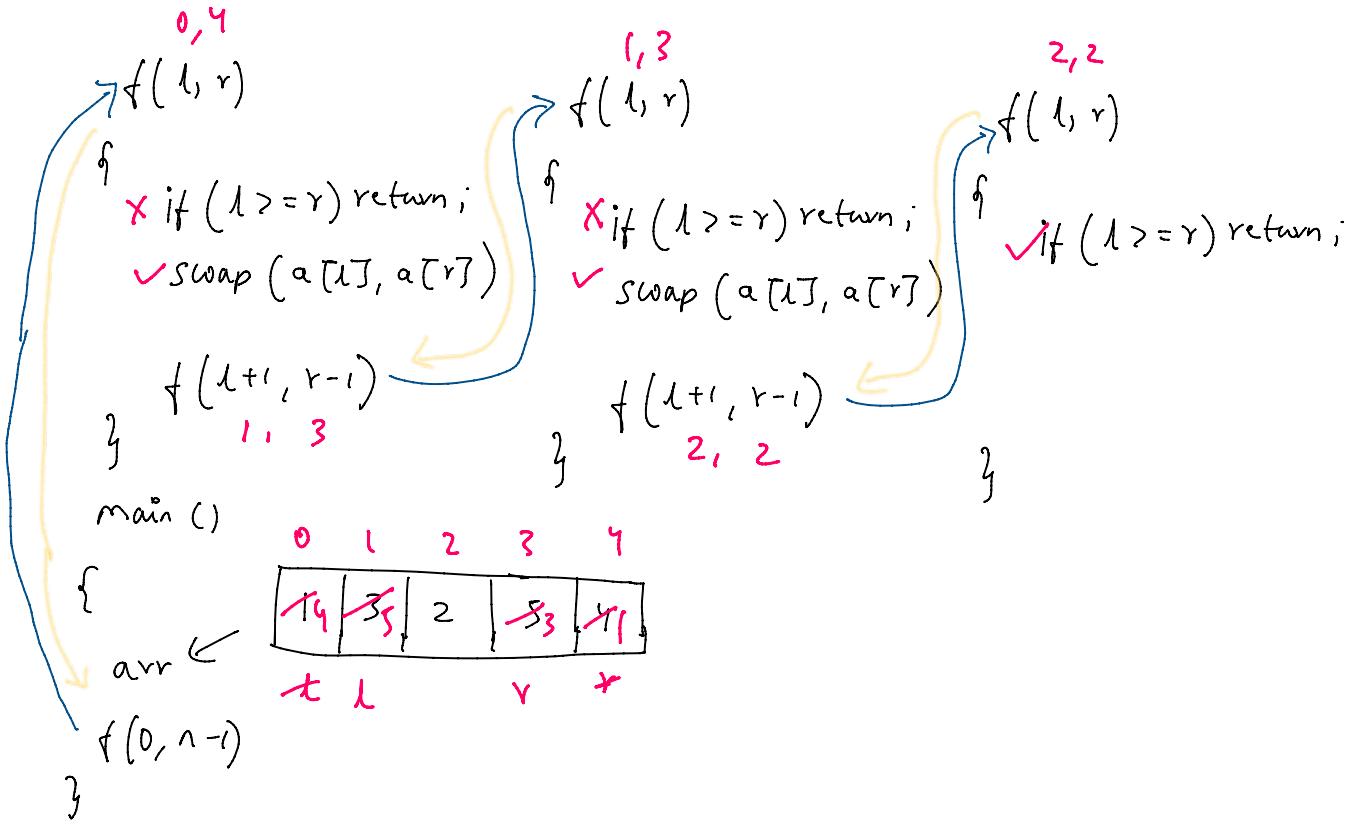
for loop/while

```
s = 0
e = n-1
swap (s, e)
s++
e--
```

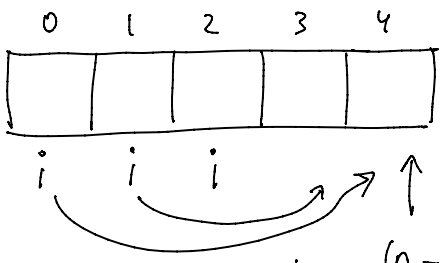
Recursion Using Two Pointer :



⇒ Recursion job is to swap . and l++ and r--



Can you solve this using single pointer?



$n = 5$

$(n - i - 1)$

$(5 - 0 - 1) = 4$

$(n - i - 1)$

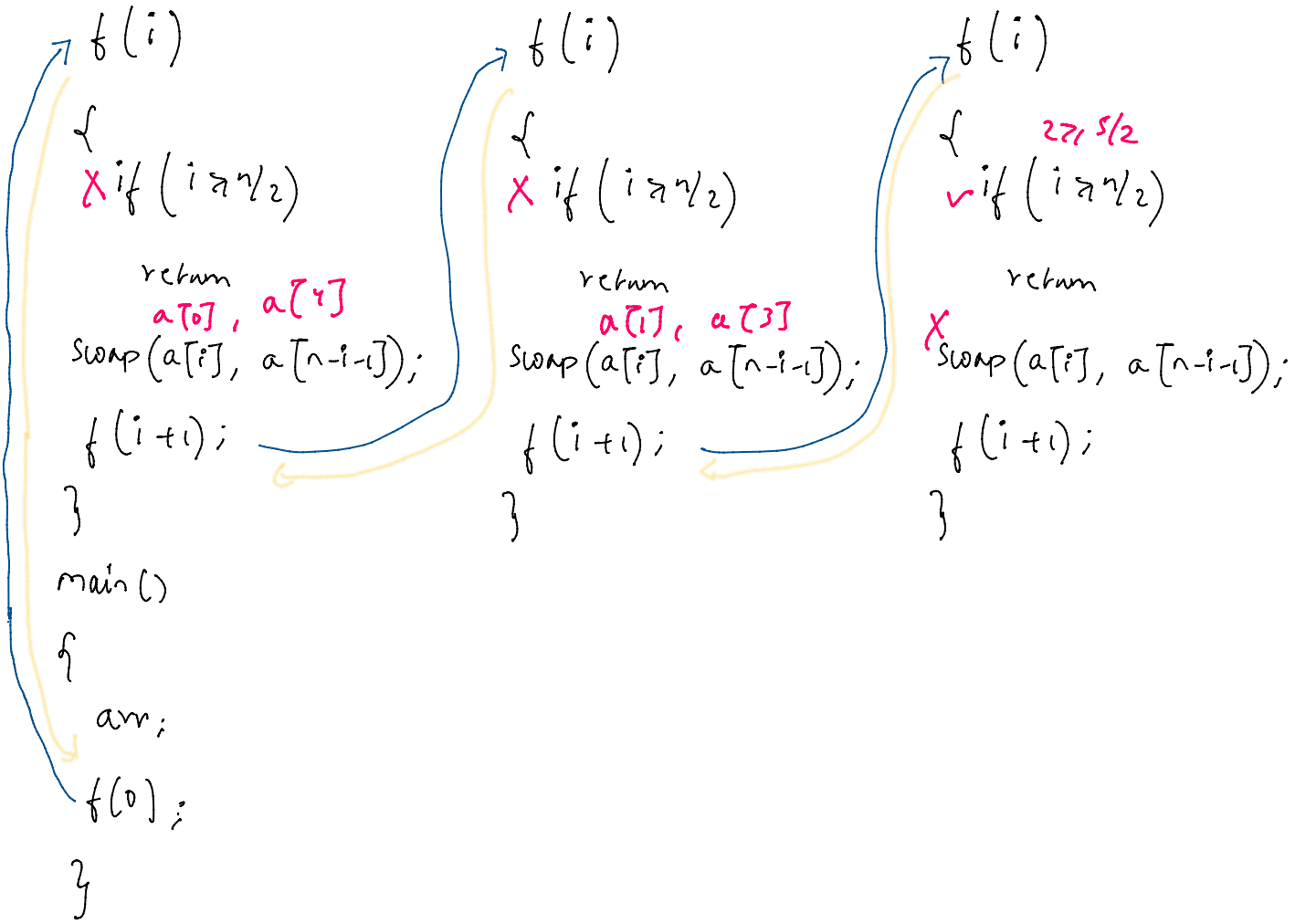
$5 - 1 - 1 = 3$

swap $(i, n - i - 1)$

till how long?

$(i >= n/2)$ until middle

0 1 2




```cpp
#include<bits/stdc++.h>
using namespace std;
void reverse(int i, int arr[], int n){
    //base
    if(i >= n/2) return;
    swap(arr[i], arr[n-i-1]);
    reverse(i+1, arr, n);
}

int main(){
    int n;
    cin>>n;
    int arr[n];
    for(int i = 0; i<n; i++)
        cin >> arr[i];
    reverse(0, arr, n);
    for(int i =0; i<n; i++)
        cout << arr[i] << " ";
    return 0;
}
```

```
1 5
2 1 2 3 4 5
```

output.in

```
1 5 4 3 2 1
```

(2) Palindrome :-

Check if a string is palindrome or not

"MADAM" —reverse→ "MADAM" (true)

"MADAM" reverse → "MADAM" (true)

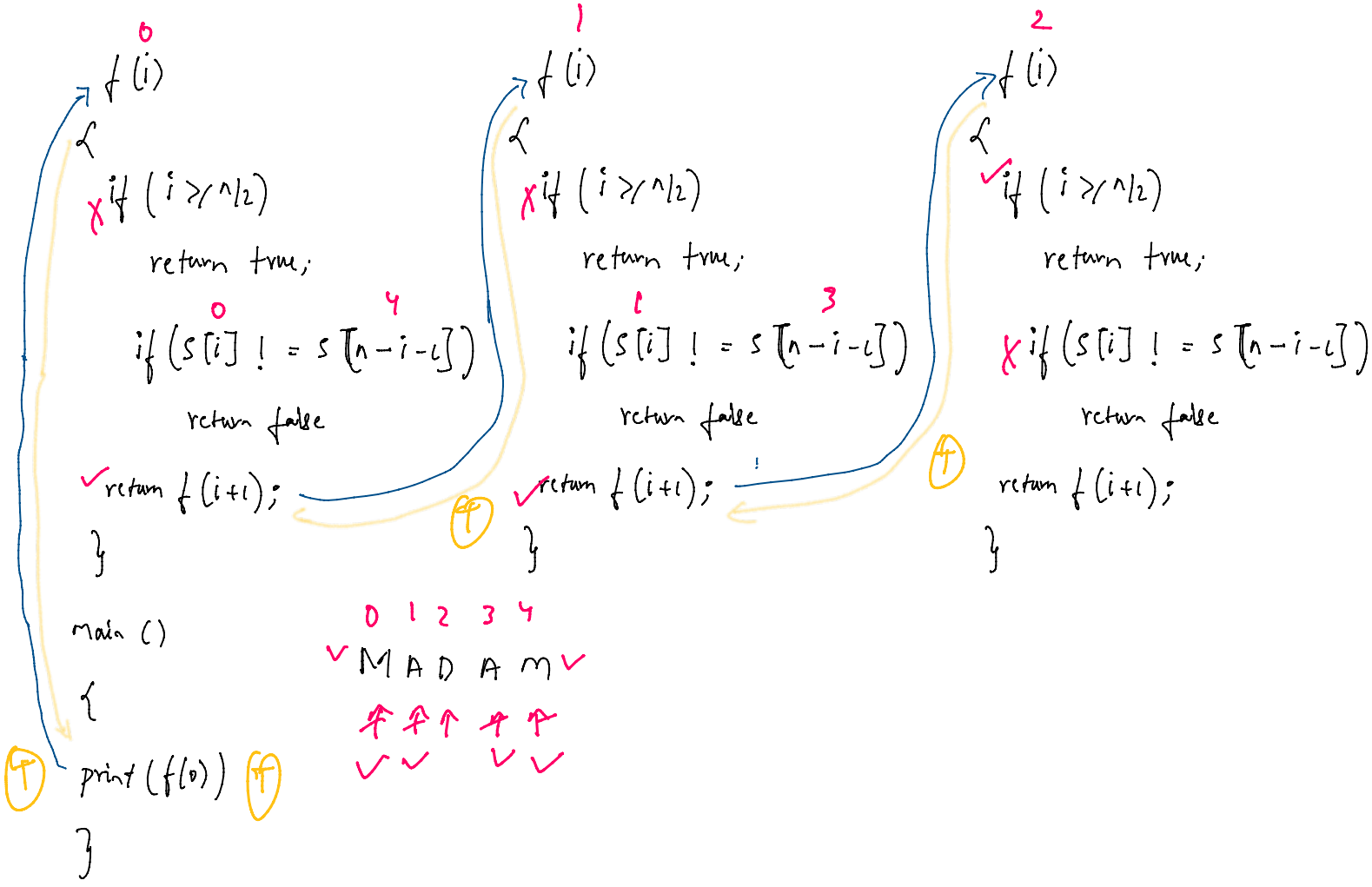
"1121" reverse → "1121" (true)

"123" reverse → "321" (false)

* It's same like reversing, the left half and the right half should be same.

↓ ↓ ↓ ↓ ↓

M A D A M



```cpp
#include<bits/stdc++.h>
using namespace std;
bool f(int i, string &s) {
    if(i >= s.size() / 2) return true;
    if(s[i] != s[s.size() - i - 1]) return false;
    return f(i+1, s);
}
int main() {
    #ifndef ONLINE_JUDGE
    freopen("input.txt", "r", stdin);
    freopen("output.txt", "w", stdout);
    #endif
    string s = "madam";
    cout << f(0, s);
    return 0;
}
```

```
1
```

True

T.C ⇒ O(n/2) // till half you are going

S.C ⇒ O(n/2)