DAY-6 test Shalini S IT 22IT098

1.Kaden's algo

practice.cpp > main()

```cpp
#include <bits/stdc++.h>
using namespace std;

int main(){
    int n;
    cin >> n;
    int arr[n];
    for(int i=0; i<n; i++){
        cin >> arr[i];
    }

    int max_sum = INT_MIN;
    int sum = 0;
    for(int i=0; i<n; i++){
        sum += arr[i];
        max_sum = max(max_sum, sum);
        if(sum < 0){
            sum = 0;
        }
    }
    cout << max_sum << endl;
    return 0;
}
```

Tc = o(n) sc = o(1)

OUTPUT:

input.txt

```
9
-2 1 -3 4 -1 2 1 -5 4
```

output.txt

```
6
```

2.maximum product subarray

practice.cpp > ...

```cpp
#include <bits/stdc++.h>
using namespace std;

int main()
{
    int n;
    cin >> n;
    int arr[n];
    for (int i = 0; i < n; i++) {
        cin >> arr[i];
    }

    int maxtill = INT_MIN;
    int pre = 1, suf = 1;

    for (int i = 0; i < n; i++) {
        pre = (pre == 0) ? arr[i] : pre * arr[i];
        suf = (suf == 0) ? arr[n - i - 1] : suf * arr[n - i - 1];
        maxtill = max(maxtill, max(pre, suf));
    }

    cout << maxtill << endl;
    return 0;
}
```

Tc = O(n) sc = O(1)

Output:

input.txt

```
4
2 3 -2 4
```

output.txt

```
6
```

3. search in rotated sorted array

```cpp
#include <bits/stdc++.h>
using namespace std;
int main() {
    int n, target;
    cin >> n >> target;
    vector<int> nums(n);
    for (int i = 0; i < n; i++) {
        cin >> nums[i];
    }
    int low = 0;
    int high = nums.size() - 1;
    while (low <= high) {
        int mid = (low + high) / 2;
        if (nums[mid] == target) {
            cout << mid;
            return 0;
        } else if (nums[low] <= nums[mid]) {
            if (nums[low] <= target && nums[mid] >= target)
                high = mid - 1;
            else
                low = mid + 1;
        } else {
            if (nums[mid] <= target && nums[high] >= target)
                low = mid + 1;
            else
                high = mid - 1;
        }
    }
    cout << -1;

    return 0;
}
```

Tc = O(logn) sc = O(1)

input.txt

```
7 0
4 5 6 7 0 1 2
```

output.txt

```
4
```

4.Container with most water

practice.cpp > main()

```cpp
#include <bits/stdc++.h>
using namespace std;
int main() {
    int n, target;
    cin >> n >> target;
    vector<int> h(n);
    for (int i = 0; i < n; i++) {
        cin >> h[i];
    }
    int maxArea = 0;
    int l = 0, r = h.size() - 1;
    while (l < r) {
        maxArea = max(maxArea, min(h[l], h[r]) * (r - l));
        if (h[l] < h[r])
            l++;
        else
            r--;
    }
    cout << maxArea;

    return 0;
}
```

Tc = o(n) sc = O(1)

Output:

input.txt

```
9
1 8 6 2 5 4 8 3 7
```

output.txt

```
49
```