

DYNAMMIC PROGRAMMING

PROBLEM 4:

LONGEST NON-DECREASING SUBSEQUENCE

AIM:

Find the length of the Longest Non-decreasing Subsequence in a given Sequence.

CODE:

```
#include <stdio.h>
```

```
#define MAX 1000
```

```
int longestNonDecreasingSubsequence(int arr[], int n) {
```

```
    int dp[MAX];
```

```
    int maxLength = 1;
```

```
    for (int i = 0; i < n; i++) dp[i] = 1;
```

```
    for (int i = 1; i < n; i++) {
```

```
        for (int j = 0; j < i; j++) {
```

```
            if (arr[i] >= arr[j] && dp[i] < dp[j] + 1) {
```

```
                dp[i] = dp[j] + 1;
```

```
            }
```

```
        }
```

```
        if (dp[i] > maxLength) maxLength = dp[i];
```

```
    }
```

```

    return maxLength;
}

```

```

int main() {
    int n;
    int arr[MAX];

    scanf("%d", &n);
    for (int i = 0; i < n; i++) scanf("%d", &arr[i]);

    printf("%d\n", longestNonDecreasingSubsequence(arr, n));

    return 0;
}

```

INPUT AND OUTPUT:

	Input	Expected	Got	
✓	9 -1 3 4 5 2 2 2 2 3	6	6	✓
✓	7 1 2 2 4 5 7 6	6	6	✓