Additional Program

**Largest Rectangle**

#include <stdio.h>

#include <stdlib.h>

// Function to find the maximum area of the histogram

long largestRectangle(int\* h, int n) {

int\* stack = (int\*)malloc(n \* sizeof(int));

int top = -1;

long max\_area = 0;

long area\_with\_top;

int i = 0;

while (i < n) {

if (top == -1 || h[stack[top]] <= h[i]) {

stack[++top] = i++;

} else {

int tp = stack[top--];

area\_with\_top = h[tp] \* (top == -1 ? i : i - stack[top] - 1);

if (max\_area < area\_with\_top) {

max\_area = area\_with\_top;

}

}

}

while (top != -1) {

int tp = stack[top--];

area\_with\_top = h[tp] \* (top == -1 ? i : i - stack[top] - 1);

if (max\_area < area\_with\_top) {

max\_area = area\_with\_top;

}

}

free(stack);

return max\_area;

}

int main() {

int n;

scanf("%d", &n);

int\* h = (int\*)malloc(n \* sizeof(int));

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

scanf("%d", &h[i]);

}

printf("%ld\n", largestRectangle(h, n));

free(h);

return 0;

}

Input : 5

2 1 5 6 2 3

Output : 10