DATA STRUCTURES AND ALGORITHMS

LAB # 08

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**Code:**

#include "stdafx.h"

#include <iostream>

#include<stack>

using namespace std;

int moves = 0;

void towerofhanoi(int disk, stack <int> \*S, stack <int> \*D, stack <int> \*A, char So, char De, char Au) {

if (disk == 1) {

int x = S->top();

S->pop();

D->push(x);

cout << "Disk is moved from " << So << " to " << De << "\t\t"

<< "( " <<(\*&S) << " to " <<(\*&D) << " )" << endl;

++moves;

return;

}

else {

towerofhanoi(disk - 1, S, A, D, So, Au, De);

int x = S->top();

S->pop();

D->push(x);

cout << "Disk is moved from " << So << " to " << De << "\t\t"

<< "( " << (\*&S) << " to " << (\*&D) << " )" << endl;

++moves;

towerofhanoi(disk - 1, A, D, S, Au, De, So);

}

}

int main() {

int disk;

stack <int> S;

stack <int> A;

stack <int> D;

cout << "Enter the number of disks: ";

cin >> disk;

cout << "\nTowers are:\n";

cout << "Tower 1 (Source): " << (&S) << endl;

cout << "Tower 2 (Auxilary): " << (&A) << endl;

cout << "Tower 3 (Destination): " << (&D) << endl<<endl;

for (int i = disk; i > 0; --i)

S.push(i);

towerofhanoi(disk, &S, &D, &A, 'S', 'D', 'A');

cout << "\nTotal moves are: " << moves << endl<<endl;

}

Output:



