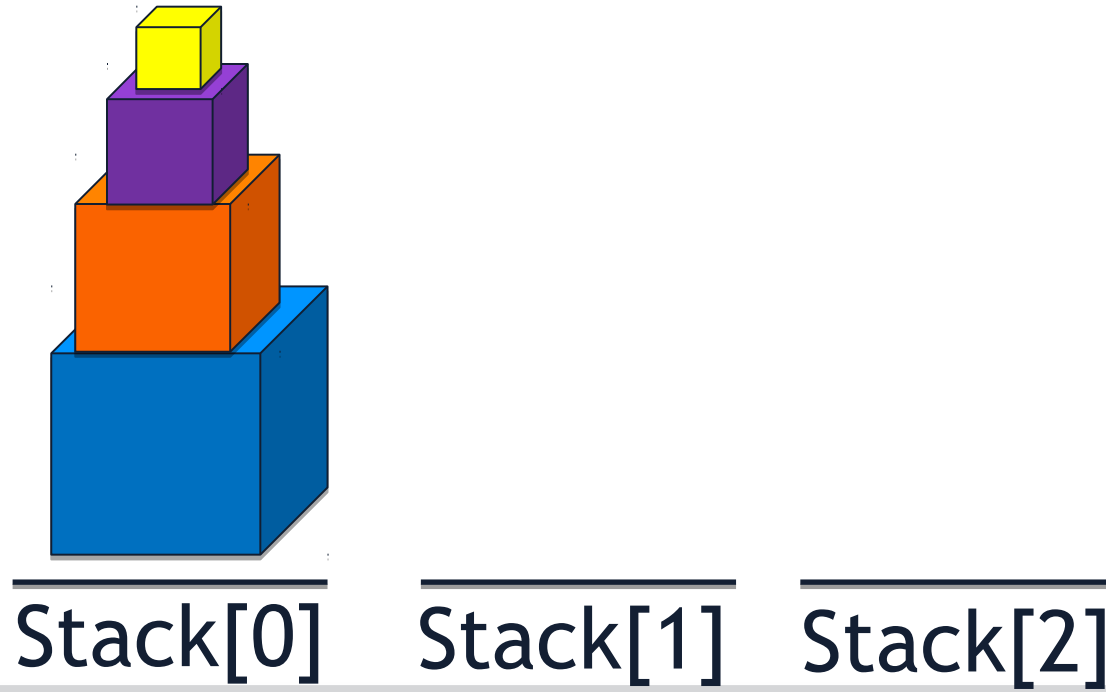


# Tower of Hanoi - Solution

Prof. Wade Fagen-Ulmschneider

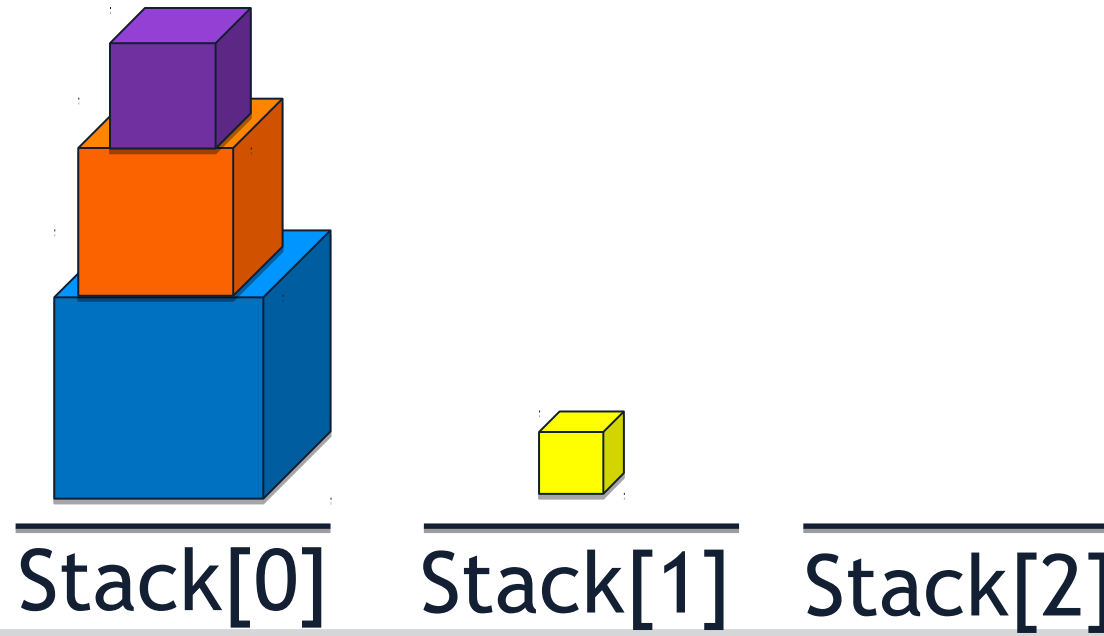
**I** ILLINOIS

Moves Made:



Moves Made:

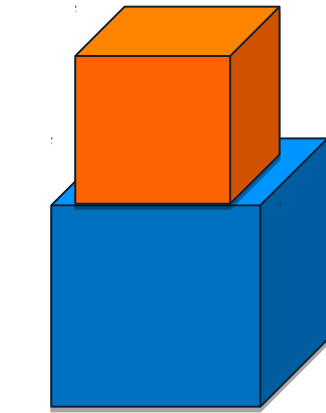
0  1



Moves Made:

0  1

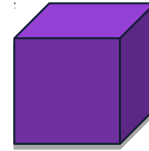
0  2



Stack[0]



Stack[1]



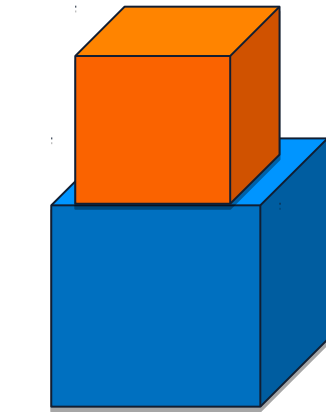
Stack[2]

Moves Made:

0  1

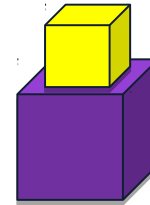
0  2

1  2



Stack[0]

Stack[1]



Stack[2]

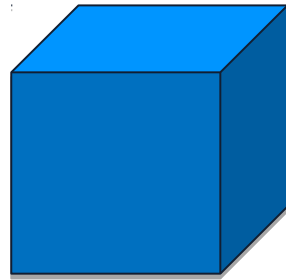
## Moves Made:

0  1

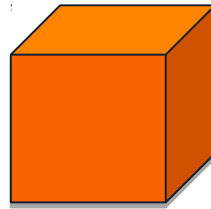
0  2

1  2

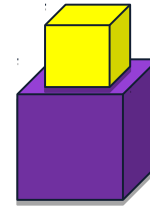
0  1



Stack[0]



Stack[1]



Stack[2]

## Moves Made:

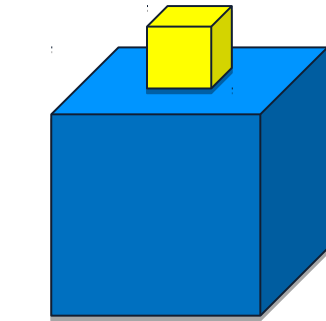
0  1

0  2

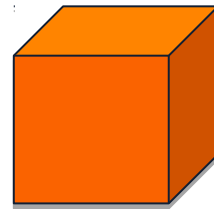
1  2

0  1

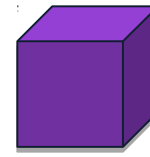
0  2



Stack[0]



Stack[1]



Stack[2]

## Moves Made:

0  1

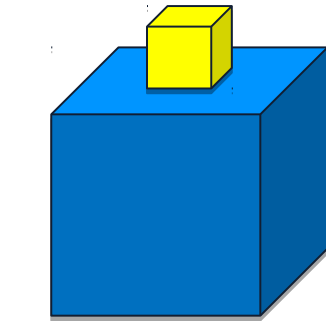
0  2

1  2

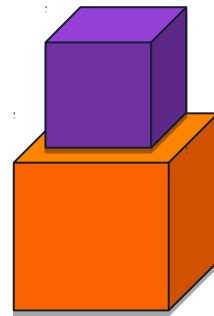
0  1

0  2

1  2



Stack[0]



Stack[1]

Stack[2]



## Moves Made:

0  1

0  2

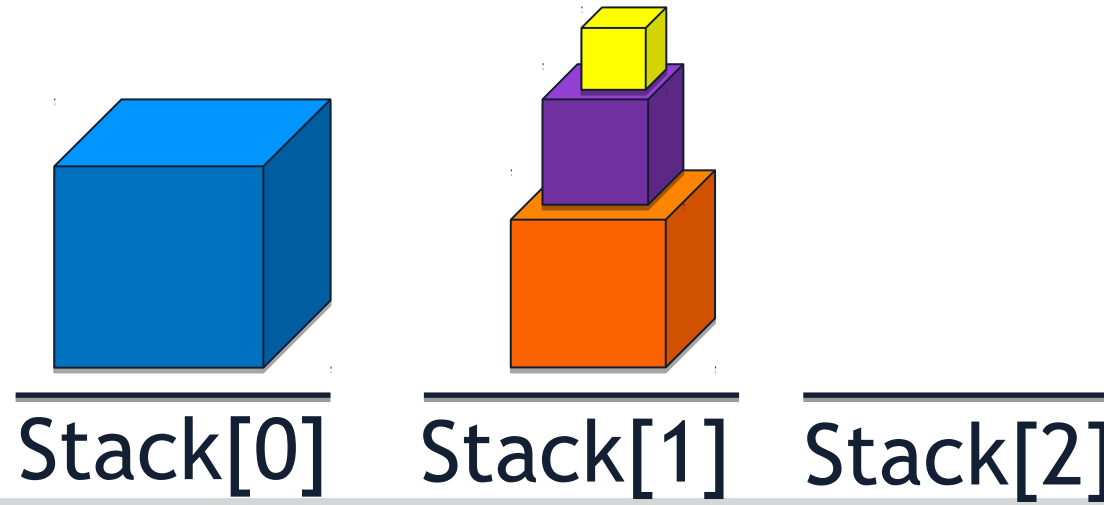
1  2

0  1

0  2

1  2

0  1



## Moves Made:

0  1

0  2

1  2

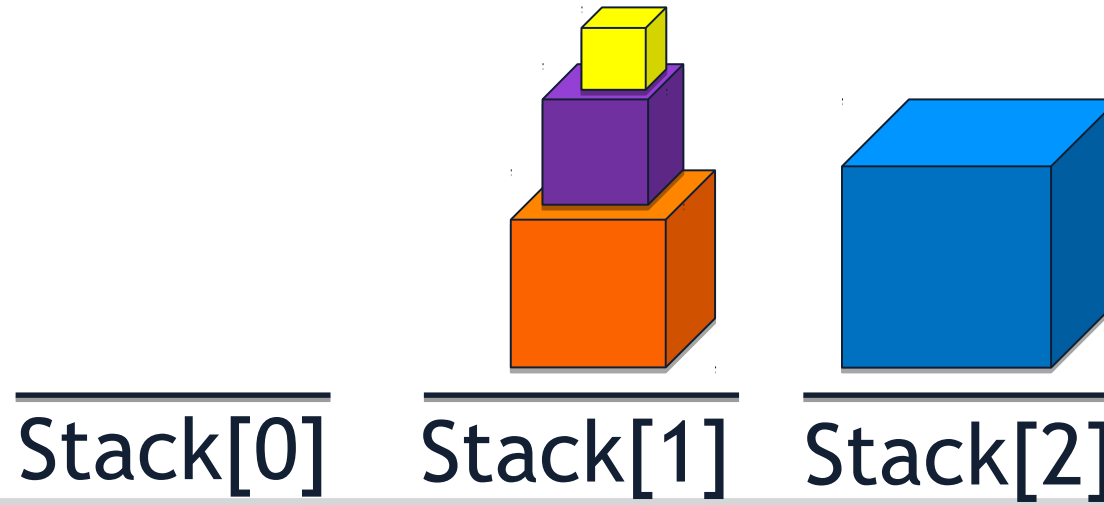
0  1

0  2

1  2

0  1

0  2



# Moves Made:

0  1

0  2

1  2

0  1

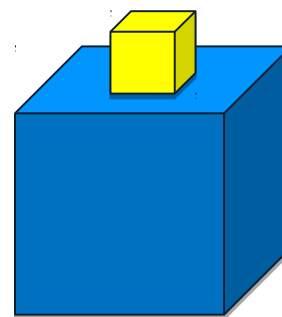
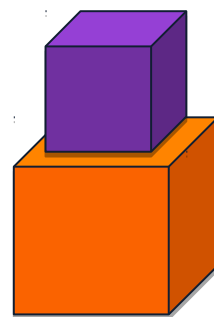
0  2

1  2

0  1

0  2

1  2









Stack[0]




Stack[1]

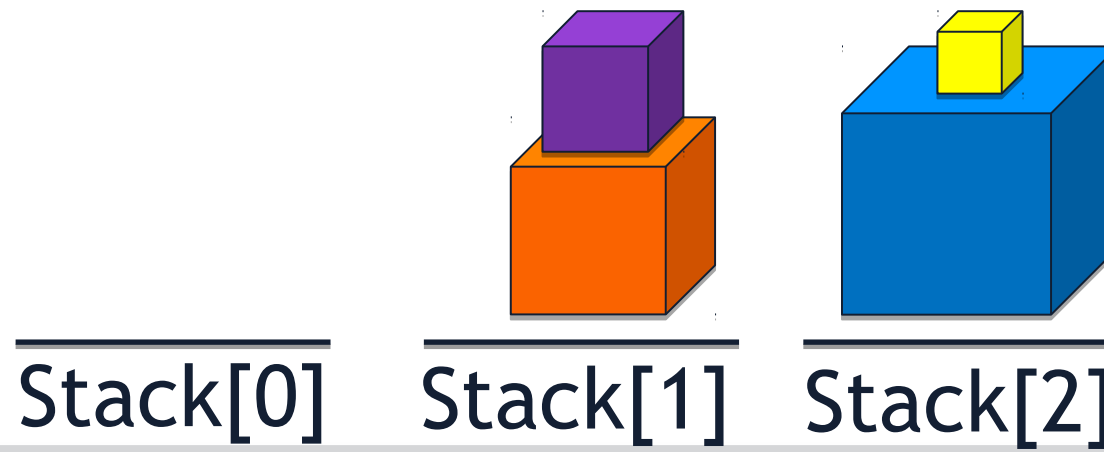
Stack[2]

## Moves Made:

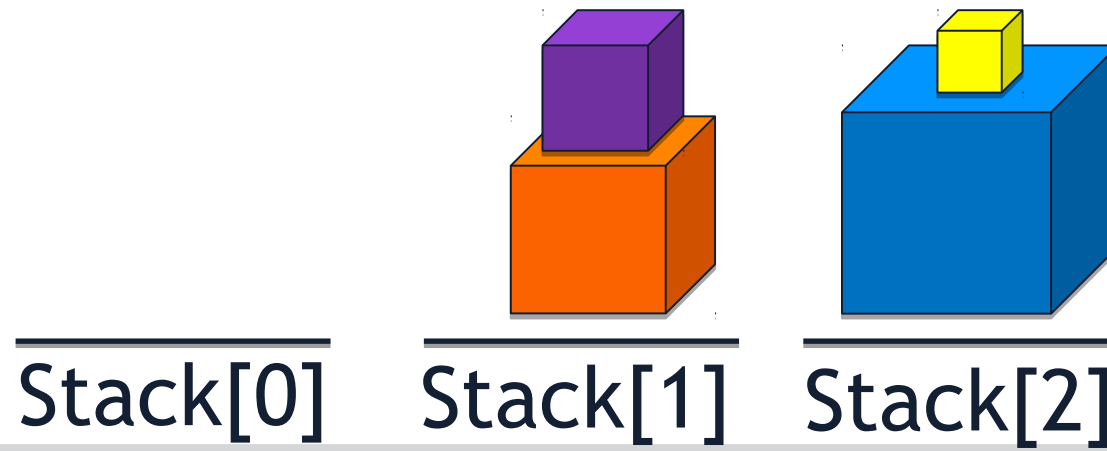
0  1  
0  2  
1  2




0  1  
0  2  
1  2




0  1  
0  2  
1  2






## Moves Made:



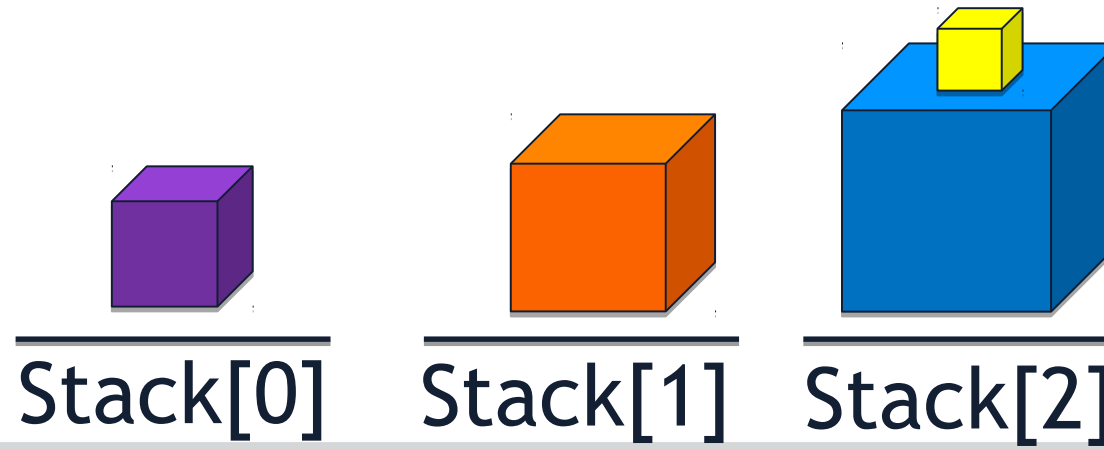
0  1  
0  2  
1  2




0  1  
0  2  
1  2




0  1  
0  2  
1  2




0 ? 1  
0 ? 2  
1 ? 2


## Moves Made:



0  1  
0  2  
1  2




0  1  
0  2  
1  2




0  1  
0  2  
1  2




0  1  
0 ? 2  
1 ? 2



## Moves Made:



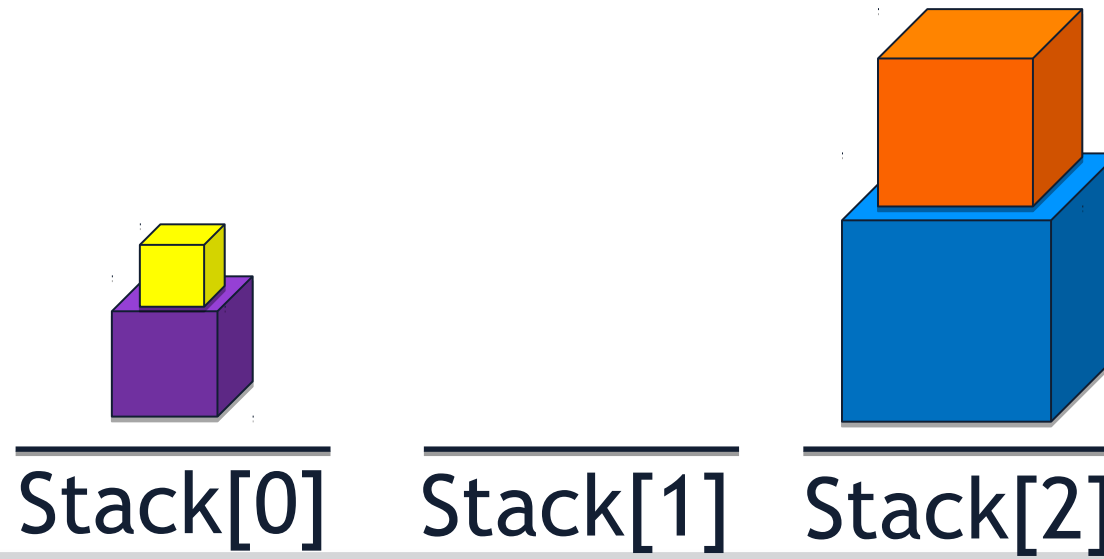
0  1  
0  2  
1  2




0  1  
0  2  
1  2




0  1  
0  2  
1  2




0  1  
0  2  
1 ? 2




## Moves Made:



0  1  
0  2  
1  2

0  1  
0  2  
1  2

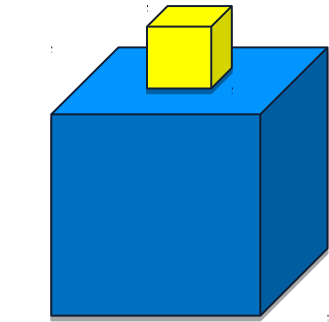
0  1  
0  2  
1  2

0  1  
0  2  
1  2

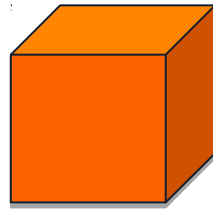


# cpp-tower-solution/Game.cpp

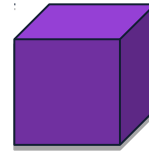
```
59 void Game::solve() {  
60     while (stacks_[2].size() != 4) {  
61         _legalMove(0, 1);  
62         _legalMove(0, 2);  
63         _legalMove(1, 2);  
64     }  
65 }
```



Stack[0]



Stack[1]



Stack[2]

# cpp-tower-solution/Game.cpp

```
43 void Game::_legalMove(unsigned index1, unsigned index2) {  
...  
49     if ( stacks_[index1].peekTop().getLength() <  
50         stacks_[index2].peekTop().getLength() ) {  
51         _move(index1, index2);  
52     } else {  
53         _move(index2, index1);  
54     }  
55  
56     cout << *this << endl;  
57 }
```

# cpp-tower-solution/Game.cpp

```
43 void Game::_legalMove(unsigned index1, unsigned index2) {
44     if ( stacks_[index1].size() == 0 &&
45         stacks_[index2].size() > 0 ) {
46         _move(index2, index1);
47     } else if (stacks_[index1].size() > 0 &&
48               stacks_[index2].size() == 0) {
49         _move(index1, index2);
50     } else if (stacks_[index1].size() > 0 &&
51               stacks_[index2].size() > 0) {
```

...

# cpp-tower-solution/Game.cpp

```
38 void Game::_move(unsigned index1, unsigned index2) {  
39     Cube    cube = stacks_[index1].removeTop();  
40     stacks_[index2].push_back(cube);  
41 }
```