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Problem Statement :

Write a program for Towers of Hanoi using appropriate knowledge representation and reasoning techniques.

In [1]:
```python
def Hanoi(n, A, B, C):
    count = 1
    if n==1 :
        print("Move disk ", n, " from " , A, " to ", C)
        return count
    else :
        count += Hanoi(n-1, A, C, B)
        print("Move disk ", n, " from " , A, " to ", C)
        count += Hanoi(n-1, B, A, C)
        return count
```

In [2]:
```python
Hanoi(3,'A','B','C')
```

```
Move disk  1  from  A  to  C
Move disk  2  from  A  to  B
Move disk  1  from  C  to  B
Move disk  3  from  A  to  C
Move disk  1  from  B  to  A
Move disk  2  from  B  to  C
Move disk  1  from  A  to  C
```
Out[2]: 7

In [3]:
```python
Hanoi(4, "Tower 1", "Tower 2", "Tower 3")
```

```
Move disk  1  from  Tower 1  to  Tower 2
Move disk  2  from  Tower 1  to  Tower 3
Move disk  1  from  Tower 2  to  Tower 3
Move disk  3  from  Tower 1  to  Tower 2
Move disk  1  from  Tower 3  to  Tower 1
Move disk  2  from  Tower 3  to  Tower 2
Move disk  1  from  Tower 1  to  Tower 2
Move disk  4  from  Tower 1  to  Tower 3
Move disk  1  from  Tower 2  to  Tower 3
Move disk  2  from  Tower 2  to  Tower 1
Move disk  1  from  Tower 3  to  Tower 1
Move disk  3  from  Tower 2  to  Tower 3
Move disk  1  from  Tower 1  to  Tower 2
Move disk  2  from  Tower 1  to  Tower 3
Move disk  1  from  Tower 2  to  Tower 3
```
Out[3]: 15

In [4]:
```python
n = int(input("Enter number of rings : "))
Hanoi(n,'A','B','C')
```

```
Enter number of rings : 5
Move disk  1  from  A  to  C
Move disk  2  from  A  to  B
Move disk  1  from  C  to  B
Move disk  3  from  A  to  C
Move disk  1  from  B  to  A
Move disk  2  from  B  to  C
Move disk  1  from  A  to  C
Move disk  4  from  A  to  B
Move disk  1  from  C  to  B
Move disk  2  from  C  to  A
Move disk  1  from  B  to  A
Move disk  3  from  C  to  B
Move disk  1  from  A  to  C
Move disk  2  from  A  to  B
Move disk  1  from  C  to  B
Move disk  5  from  A  to  C
Move disk  1  from  B  to  A
Move disk  2  from  B  to  C
Move disk  1  from  A  to  C
Move disk  3  from  B  to  A
Move disk  1  from  C  to  B
Move disk  2  from  C  to  A
Move disk  1  from  B  to  A
Move disk  4  from  B  to  C
Move disk  1  from  A  to  C
Move disk  2  from  A  to  B
Move disk  1  from  C  to  B
Move disk  3  from  A  to  C
Move disk  1  from  B  to  A
Move disk  2  from  B  to  C
Move disk  1  from  A  to  C
```
Out[4]: 31

In [5]:
```python
n = int(input("Enter number of rings : "))
Hanoi(n,'A','B','C')
```

```
Enter number of rings : 6
Move disk  1  from  A  to  B
Move disk  2  from  A  to  C
Move disk  1  from  B  to  C
Move disk  3  from  A  to  B
Move disk  1  from  C  to  A
Move disk  2  from  C  to  B
Move disk  1  from  A  to  B
Move disk  4  from  A  to  C
Move disk  1  from  B  to  C
Move disk  2  from  B  to  A
Move disk  1  from  C  to  A
Move disk  3  from  B  to  C
Move disk  1  from  A  to  B
Move disk  2  from  A  to  C
Move disk  1  from  B  to  C
Move disk  5  from  A  to  B
Move disk  1  from  C  to  A
Move disk  2  from  C  to  B
Move disk  1  from  A  to  B
Move disk  3  from  C  to  A
Move disk  1  from  B  to  C
Move disk  2  from  B  to  A
Move disk  1  from  C  to  A
Move disk  4  from  C  to  B
Move disk  1  from  A  to  B
Move disk  2  from  A  to  C
Move disk  1  from  B  to  C
Move disk  3  from  A  to  B
Move disk  1  from  C  to  A
Move disk  2  from  C  to  B
Move disk  1  from  A  to  B
Move disk  6  from  A  to  C
Move disk  1  from  B  to  C
Move disk  2  from  B  to  A
Move disk  1  from  C  to  A
Move disk  3  from  B  to  C
Move disk  1  from  A  to  B
Move disk  2  from  A  to  C
Move disk  1  from  B  to  C
Move disk  4  from  B  to  A
Move disk  1  from  C  to  A
Move disk  2  from  C  to  B
Move disk  1  from  A  to  B
Move disk  3  from  C  to  A
Move disk  1  from  B  to  C
Move disk  2  from  B  to  A
Move disk  1  from  C  to  A
Move disk  5  from  B  to  C
Move disk  1  from  A  to  B
Move disk  2  from  A  to  C
Move disk  1  from  B  to  C
Move disk  3  from  A  to  B
Move disk  1  from  C  to  A
Move disk  2  from  C  to  B
Move disk  1  from  A  to  B
Move disk  4  from  A  to  C
Move disk  1  from  B  to  C
Move disk  2  from  B  to  A
Move disk  1  from  C  to  A
Move disk  3  from  B  to  C
Move disk  1  from  A  to  B
Move disk  2  from  A  to  C
Move disk  1  from  B  to  C
```
Out[5]: 63

In [ ]: