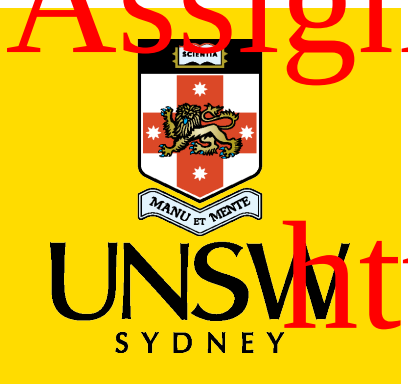


# COMP9020

Foundations of Computer Science



Lecture 9 Preview: Recursion

# Puzzle: Towers of Hanoi



- There are 3 towers (pegs)
- $n$ disks of decreasing size placed on the first tower
- You need to move all disks from the first tower to the last tower
- Larger disks cannot be placed on top of smaller disks
- The third tower can be used to temporarily hold disks

# Puzzle: Towers of Hanoi



# Puzzle: Towers of Hanoi



# Puzzle: Towers of Hanoi



# Puzzle: Towers of Hanoi



# Puzzle: Towers of Hanoi



# Puzzle: Towers of Hanoi



# Puzzle: Towers of Hanoi



# Puzzle: Towers of Hanoi



# Puzzle: Towers of Hanoi



# Puzzle: Towers of Hanoi



**Questions**

- Describe a general solution for $n$ disks
- How many moves does it take?

# Weekly Challenge 2



https://www.cse.unsw.edu.au/~cs9020/cgi-bin/hanoi

**Challenge**

- Find the optimal solution for 10 disks.
- Collaboration/collusion strongly encouraged.
- If more than 50 students achieve an optimal solution before Friday lecture there'll be prizes for **all students**[a]!

[a] who attend the Friday lecture