

Tower of Hanoi: Loops/Repetition

Unplugged Computer Science Fair Demonstration

Summary

Participants will see how the instructions for some tasks – like the Tower of Hanoi – can be explained with repetition. In code, repetition is called a loop.

Overview

On the table are 3 posts with 5 different-sized disks stacked from largest to smallest. Can the stack be moved to one of the side posts by moving 1 disk at a time and never putting a larger disk onto a smaller disk?

HS students explain the puzzle and allow the participant to attempt the solution. Hints and suggestions are provided. When complete, the participant is asked if they noticed how repetitive the steps were. More disks are added and the 3 steps of the solution are shown with the loop.



Computer Science Connection

Algorithm – An algorithm is a sequence of steps to accomplish a task.

Programming - Writing a sequence of instructions for a computer to follow.

Loop - A sequence of instructions that are repeated multiple times.

Take-away


"What are some actions you do repeatedly that could be written as a loop?"

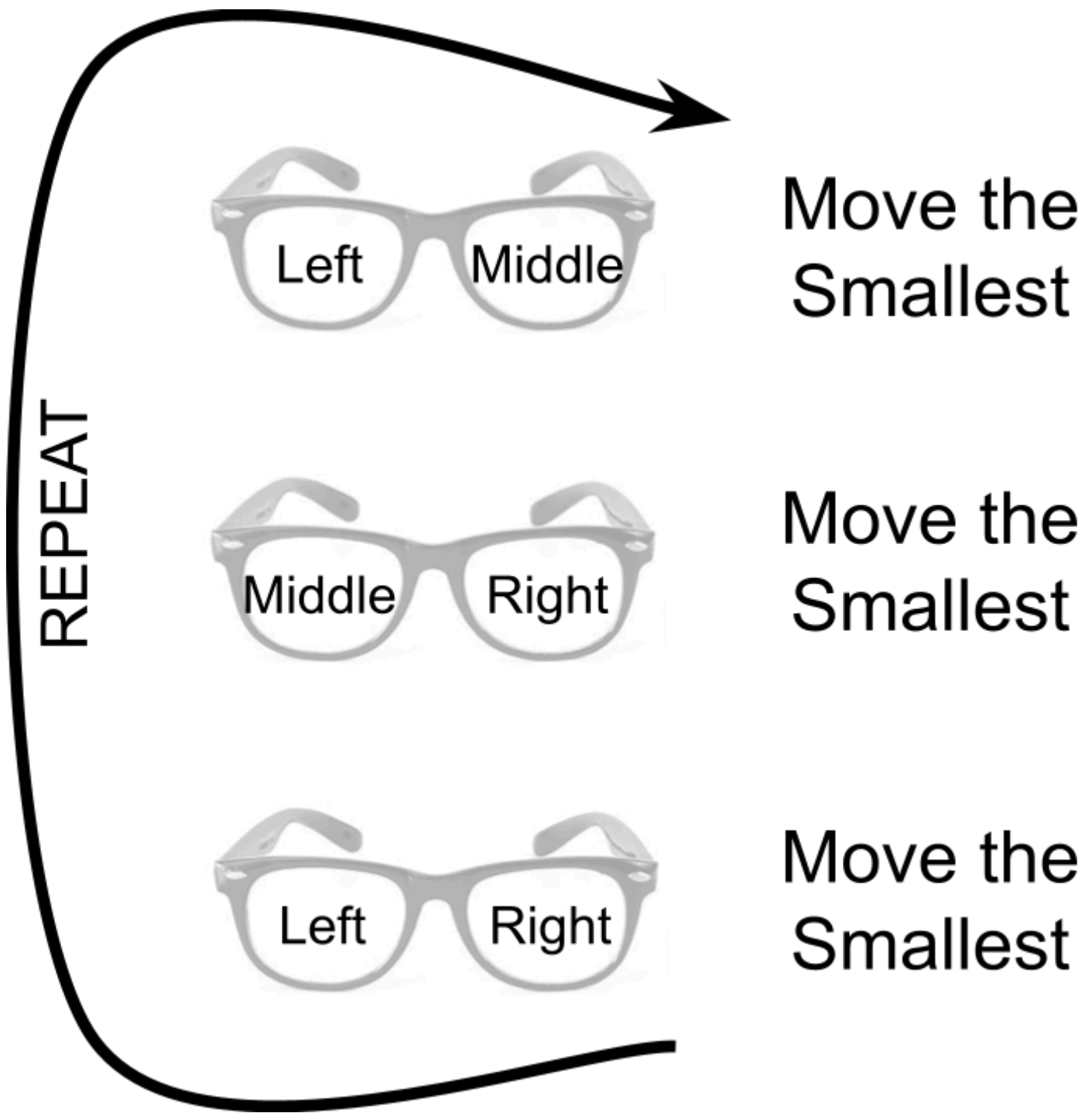
"What is something a computer does repeatedly?"

Supplies

- [Stacking Rings](#)
- Print-out of the looped-algorithm

References

- <https://www.mathsisfun.com/games/towerofhanoi.html>
- Example:  Towers Of Hanoi Iterative



1. For Left & Middle posts, move the smallest disk to the other post.
2. For Middle & Right posts, move the smallest disk to the other post.
3. For Left & Right posts, move the smallest disk to the other post.

when  clicked

repeat until

Middle Stack contains no disks ?

Look at Left Stack and Middle Stack

Swap smallest disk between Left Stack and Middle Stack

Look at Middle Stack and Right Stack

Swap smallest disk between Middle Stack and Right Stack

Look at Left Stack and Right Stack

Swap smallest disk between Left Stack and Right Stack



when  clicked

repeat until

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