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Lesson 1, AP Computer Science Teaching Methods

7-13-21

Aim: What is recursion, and how can I write a recursive method in pseudocode?

Warm up: Watch this short video on Russian nesting dolls. Explain step-by-step the actions the creator of the video takes to go from one doll to twelve dolls.

Lesson Content: Students are introduced to the concept of recursion through reviewing the actions required to go from one Russian nesting doll to twelve.

- Think-pair-share (3 minutes): What actions does the creator of the video take to go from one doll to twelve dolls?
- Small groups (10 minutes): Use pseudocode to create an iterative procedure that goes from twelve Russian nesting dolls to one.
    - Share out: What is the goal of the procedure? How many times does it loop? How could we update our iterative procedure so it works for any number of Russian nesting dolls?
- Modeling (5 minutes): Look at this "blast-off" recursive procedure. What do you notice about it? Do you think it would crash? How would it work step-by-step? Definition: Recursion - A procedure is used within its own definition.
- Small groups (15 minutes): Use pseudocode to create a recursive procedure that goes from any number of nesting dolls to one with references to itself.
    - Share out: What is recursion? What is the base case? How does the procedure call change each time to ensure we reach our base case? What are possible advantages to doing this iteratively? What are advantages to doing it recursively?
- Closing: Recursion - A procedure is used within its own definition. Your homework is to do code tracing of the recursive factorial method. Describe line-by-line how it works?