Chafetz, Paul

AP Computer Science

Ms. Sheikh

2/27/2019

12.08 Recursion Presentation Outline

1. Discuss the meaning of recursion. What is it? How does it work? How can you do it?
2. Explain “divide and conquer.” Show how it applies to recursion. How do you divide? What does it mean to conquer? What does this do and how does it help you solve a recursive situation?
3. Provide an example: organizing a school event (a play). In a play, there are many components: the actors, stage and decorations, marketing, selling tickets, etc. Focusing only on the stage, how can you break it up? How can you continuously divide the big issue of setting up the stage into smaller subdivisions that are easier to solve, like the color themes, props, and decorations? Finally, how do you put it all back together into the original problem of building the stage that you couldn’t directly solve earlier?
4. Provide a second example: writing an essay. An essay alone is hard to write. By dividing and conquering it, it becomes easier. An essay can be divided into an intro, a 3-paragraph body, and a conclusion. The intro can further be divided into sections (opening statement and thesis). The 3-paragraph body can be split into three different sections, one for each paragraph, which can be divided further. The conclusion can also be split into subsections. Once it is broken down into its smallest parts, you can write the essay section by section, part by part. When you combine all the pieces, you will have a finished essay.
5. Recursion can be used in mathematical functions, such as a piecewise function. You can use the S-S-S strategy to solve it. First, simplify the problem into smaller components. Keep dividing as per the recursive call dictates until there is no more need for division (the smallest subsection). From there, substitute in the base case into the smallest subsection and work it out backwards. When you simplify each sub-problem, the problem before it becomes possible, until you reach the original question. Solve for the final answer and be proud of your use of recursion!