Enfei Zhang

ICS4U0

Ms. Krasteva

Recursion - Application 1

**1. What are the criteria for a recursive solution?**

The criteria for a recursive solution include having a way to reduce the problem into smaller and repetitive elements, being able to find and reach the end of a solution, and creating a larger result from the smaller repetitive elements.

**2. Think of another everyday example. NOT mentioned on this assignment or during the lesson!**

One everyday example of recursion is when a person on a crowded public transit bus is trying to get off. When the person is trying to get off they have to ask the person in front of them to move, which causes them to ask the next person and so on. If the bus is too full those people will then have to get off the bus to let the person off and then come back on.

**3. Give two specific problems associated with recursion, and two reasons for using recursion.**

Problems:

1. Time: Everything that is performed when the method is called: allocating, releasing and copying values into the local memory contribute to the overall time the method takes to complete.

2. Space: Every time the method is called, it may be necessary to allocate more space for the parameters and local variables of the method. This is so that the program knows where to go back to when the method has finished. So the amount of space needed may need to be similar to the amount of times the method will be called.

Reasons:

1. Understanding: It is easier to understand a recursive method than a non-recursive method, because they are shorter and clearer.

2. Algorithm: The program will directly reflect the abstract solution strategy.

**4. What does an iterative solution mean?**

An iterative solution means that instead of repeating a method to reduce the problem into smaller sections until a condition is met, you instead set a condition on a loop and then run the loop until the condition is met.