Assignment 1

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1 What is a greedy algorithm?

A greedy algorithm is a heuristic method which attempts to find the most optimal course of action in a given problem of algorithmic nature. The aim of a greedy algorithm is to curtail the unreasonable amount of steps a traditional algorithm undertakes. Unlike traditional algorithms, greedy algorithms have functions which decide and concede certain courses of action, hence the name greedy. Because of it's greed, these functions attempt to lead the algorithm towards the solution by exhausting the least amount of steps possible.

2 How else could you solve the problem above?

There are other methods by which one can solve the preceding problem– the most obvious being a solution via dynamic programming. This method works by combining an amalgam of the small values which would reach the desired value– or thresholds which would work towards reaching the amount. Though this process is accurate, it is quite noticeably less efficient than a Greedy Algorithm in many contexts, predominantly those involving the exchange of American currency.

3 What other uses do Greedy Algorithms have?

Unfortunately greedy algorithms don't always reach an optimum resolution by going through the greatest values down. In turn, they commit to certain decisions prematurely which can render the program and algorithm inefficient. For example, in greedy coloring, the algorithm doesn't invariably find an optimum solution but nev-

ertheless is a nice avenue towards find quick solutions. These algorithms are usually preferred over often slower ones which render usually good solutions, but in the case that a Greedy Algorithm is confirmed optimal, it useful for tree-type problems (vertices).