

# CPSC 411

# Design and Analysis of Algorithms

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Set 4: Greedy Algorithms

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Fall 2008

# Greedy Algorithm Paradigm

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- Characteristics of greedy algorithms:
  - make a sequence of choices
  - each choice is the one that seems best so far, only depends on what's been done so far
  - choice produces a smaller problem to be solved
- In order for greedy heuristic to solve the problem, it must be that the optimal solution to the big problem contains optimal solutions to subproblems

# Designing a Greedy Algorithm

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- Cast the problem so that we make a greedy (locally optimal) choice and are left with one subproblem
- Prove there is always a (globally) optimal solution to the original problem that makes the greedy choice
- Show that the choice together with an optimal solution to the subproblem gives an optimal solution to the original problem