CS 610, Spring 2009, Prof. Calvin
Homework #5 Programming Problem

Write a program to solve 0/1 knapsack problems exactly and also approximately using the decreasing density greedy heuristic. Perform an experimental analysis of the two approaches using randomly generated problem instances as follows.

Let the item weights and values be independent and uniformly distributed between 1 and 100 (that is, takes value i with probability $1/100$ for $i = 1, 2, \ldots, 100$). Let the total weight constraint be $25 \cdot n$.

Choose a value of n large but not so large that your program takes excessive time. Run 100 independent replications, and each approach compute the average difference between the value obtained and the upper bound given by the fractional solution.