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CIS 263

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Assignment 10

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PS D:\Git Repos\CIS 263> python -u "d:\Git Repos\CIS 263\Homework\Week 5\Assignmentten.py"

Short Knapsack Problem (Capacity = 11):
Maximum value: 40
Items used (value, weight):
(18, 5)
(22, 6)

Long Knapsack Problem (Capacity = 10000):
Maximum value: 1215693
Items used (value, weight):
(16808, 250)
(50074, 659)
(77924, 710)
(64441, 166)
(84493, 43)
(82328, 730)
(78841, 613)
(44304, 170)
(17710, 158)
(29561, 934)
(93100, 279)
(51817, 336)
(99098, 827)
(13513, 268)
(23811, 634)
(80980, 150)
(36580, 822)
(25486, 746)
(25229, 92)
(40195, 358)
(35002, 154)
(88125, 197)
(27723, 667)
(28550, 25)
PS D:\Git Repos\CIS 263> █
```

Figure 1: Program output

Variables used are split up by function

knapsackSolver

values - List of all values for all the items.

weights - List of the weights of all the items.

capacity - The total amount of weight the knapsack can carry.

numItems - The number of total items there are in the list.

dpTable - Stores the dynamic programming table used to determine the max value.

i - Iterator used to determine the current item being looked at.

currentWeight - The current weight of all the items in the knapsack.

itemsUsed - List of all the items used in the max value of the knapsack.

maxValue - Stores the maximum value that can be achieved with optimum packing for the knapsack given the list of items available.

knapsackTest

capacity - Total amount of weight the knapsack can carry.

items - A list of tuples that have the value and weight of all the possible items that could be used.

values - List of all values for all the items.

weights - List of the weights of all the items.

maxValue - Stores the maximum value that can be achieved with optimum packing for the knapsack given the list of items available.

itemsUsed - List of all the items used in the max value of the knapsack.

item - Iterator used to print all the items in the itemsUsed list.

main()

items1 - list of all possible items that could be used in the small knapsack problem.

items2 - list of all possible items that could be used in the large knapsack problem.