**Fast Algorithm Write-Up**

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* What methods did you use to speed up your algorithm and why did you choose that method?
  + We used the method of exploiting the characteristics of the problem and its data attributes to speed up our original algorithm to dynamic programming. We noted that iterating through all of our items twice was severely increasing our run time, so we decided to run through our list of items just once. We also created just one list that kept track of the items and the total value inside the bin instead of keeping track of two seperate variables.
* Run your original algorithm on the larger datasets for this problem and compare its running time versus the running time of your new, faster algorithm. What percentage reduction in running time did you achieve?
  + Problem 0: It took us 1:38 to run our original algorithm on the problem 0’s dataset. After we used dynamic programming to speed up our algorithm, we achieved a 98% reduction in running time and the new algorithm only took 0:03 to run.
  + Problem 1: It took us 27:54 to run our original algorithm on the problem 1’s dataset. After we used dynamic programming to speed up our algorithm, we achieved 94.4% reduction in running time and the new algorithm only took 1:36 to run.
* Compute the running times of your original and improved algorithms using Big-Oh notation.
  + The running time of our original algorithm is n\*n, which is calculated as O(N2).
  + The running time of our improved algorithm is n, which is calculated as O(N).