# M6: Knapsack Algorithm Assignment

## Instructions

Design and write an algorithm in Python to solve the Knapsack Problem. Develop your algorithm within the provided Python program, knapsack-template.py, according to these directions:

* Retrieve the assignment materials from the Assignment page; rename your file to KnapsackDev.py.
* Implement your algorithm in the Python program named KnapsackDev.py in the function named loadKnapsack().
* Use KnapsackDev.py to test your algorithm for the 10 problems in the accompanying JSON data file, knapsack.json.

### Guidance

Details on the loadKnapsack()function:

* Your task:
  + Program loadKnapsack() so that it creates a list of item ID numbers (integers) in the items\_to\_pack variable indicating which items are placed in the knapsack.
* Input arguments:
  + items: a dictionary of the items not yet in the knapsack, with:
    - keys representing the item ID numbers (integer);
    - values as 2-tuples where the 0th element is the volume of the item and the 1st element is the value of the item;
      * e.g., {0: (1,2), 1: (2,5)…}
    - The code in KnapsackDev.py already creates this dictionary from a JSON file and inputs it into loadKnapsack().
  + knapsack\_cap: This value represents the volume capacity of the knapsack. Its value is already set in the KnapsackDev.py program based on the JSON data in knapsack.json. You need not make any changes.
* Output arguments:
  + myUsername: your W&M username in order to identify the output as your work
  + myNickname: a string variable indicating how you would like to be identified on a leaderboard showing the scores of everybody in class, which will be visible to your classmates. If you choose not to be identified on the leaderboard, you may return an empty string, that is, ''.
  + items\_to\_pack: the list containing the item ID numbers your algorithm will place in the knapsack

### Submission

* Once you have completed developing your algorithm, then sumbit your KnapsackDev.py file via Canvas.