Hints for Knapsack Packing

- How should we store the information (W_i, V_i) of the items?
- In what order should we store/process the items?
    - Recall that we require the difference between the weight of the heaviest chosen item and the lightest chosen item to be at most D.
    - Suppose that we have already chosen the lightest item. In what order should we store/process the items to help us identify the other possible items that we can choose quickly?
        - Should we store/process the items in no particular order?
        - Should we store/process the items ordered by W_i?
        - Should we store/process the items ordered by V_i?
- Beginning from the lightest item that we have chosen, we have a **window** of candidate items that we can still choose.
    - Which items are in this window?
    - Which items from the window should we choose to put into our knapsack?
    - What data structure should we use to maintain the items in our knapsack?
- After we have found the maximum obtainable value for the window given by the lightest item that we have chosen previously, we can try to 'shift' the window of candidate items by choosing the next lightest item as the lightest item in our knapsack instead.
    - Which items are in the new window?
    - In the previous window, there are some items that we have not chosen to put into our knapsack. Should we still consider these items in the new window?
        - If we need to reconsider these items, what data structure should we use to store these items?