CS 121 **Lab Assignment #10**
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1 Objective

Write functions to *filter* data stored in an array/list.

2 Background

The process of filtering information is very common. The most obvious example is removing unwanted pops from music recordings. Other examples include the generation of lists of customers that live in some specific geographic region, students having a GPA above/below some value, etc.

3 Activities

1. Write a function to filter out (remove) all values *above* some specified value. For example, a filtering function with the following prototype:

   ```
   void FilterAbove( int A[], int &nA, int t );
   ```

   when passed the array, number of elements, and threshold values below:

   `A[] = {1 2 3 4 5 2 3 4 6}`, `nA = 9`, `t = 4`

   would modify the contents of the array and the number of elements in the array to:

   `A[] = {1 2 3 4 2 3 4 }`, `nA = 7`

2. Write a function to filter out (remove) all values *below* some specified value.

3. Perform the same actions without destroying the original array. This may be easier, since it requires less bookkeeping.

4. Repeat each of the actions above for data stored in a singly-linked list.

4 Deliverables

1. Annotate a `script` session to demonstrate that your code for filtering values:

   - From an array, **overwriting** the original array, above some threshold value
   - From an array, overwriting the original array, **below** some threshold value
   - From an array, **into a new array**, above some threshold value
   - From an array, into a new array, **below** some threshold value
   - From a **linked list**, **overwriting** the original linked list, above some threshold value
   - From a linked list, overwriting the original linked list, **below** some threshold value
   - From a linked list, **into a new linked list**, above some threshold value
   - From a linked list, into a new linked list, **below** some threshold value

   notice that there should be output from eight (**8**) functions total.

2. Filtering functions (the source) for the eight functions described above.

3. Document any issues/problems as you encounter them (Programming Log).

4. Can you write a *single* function to filter data based upon an **arbitrary** condition? [Do not implement; just provide a thoughtful answer. We will see how to do this in a future lab.]