# Special Homework for More Advanced Students

1. Write a program that initializes a list with ten random integers, and then prints four lines of output, containing:
   1. Every element at an even index
   2. Every even element
   3. All elements in reverse order
   4. Only the first and last elements
2. Write functions that carry out the following tasks for a list of integers, then write a test program for each function:
   1. Swap the first and last elements in a list
   2. Shift all elements by one to the right and move the last element into the first position [rotate operation]; for example, 1 4 9 16 25 would become 25 1 4 9 16
   3. Replace all even elements with a zero
   4. Replace each element except the first and last by the larger of its two neighbors
   5. Remove the middle element if the list length is odd, or the middle *two* elements if the list length is even
   6. Move all even elements to the front, otherwise preserving the order of the elements
   7. Return the *second-larges* element of the list
   8. Return true if the list is currently sorted in increasing order
   9. Return true if the list contains two adjacent duplicate elements
   10. Return true if the list contains any duplicate elements; this time they need not be adjacent
3. Complete the five python programs from the normal assignment on the homework 2 web page at <http://bjohnson.lmu.build/cmsi185web/homework02.html>