1. (10 points) Given two lists of integers \( L \) and \( P \) sorted in ascending order. The method \texttt{PrintLots( L, P )} will print the elements of list \( L \) in the positions specified by the integers of list \( P \). For example, if \( P = \{ 1, 3, 5 \} \) and \( L = \{ 12, 23, 43, 45, 46, 51, 66, 77 \} \) then \texttt{PrintLots( L, P )} will print 23, 45, and 51. Write the code for \texttt{PrintLots} using only the public methods of the Java List and Iterator interfaces.

2. (5 points each) Consider the Stack and Queue adapter designs discussed in class that use an ArrayList to store the data.
   a. Is it possible to obtain \( O(1) \) run time performance for all Queue operations? Justify your answer for full credit.
   b. Is it possible to obtain \( O(1) \) run time performance for all Stack operations? Justify your answer for full credit.

3. The following routine removes the first half of the list passed to it as a parameter. Examine the code, then answer the questions below.

   
   public static void removeFirstHalf( List<?> list )
   {
       int theSize = list.size( ) / 2;

       for( int i = 0; i < theSize; ++i)
           list.remove( 0 );
   }

   a. (1 pt) Why is \( \text{theSize} \) saved prior to entering the for-loop?
   b. (1 pt) What is the running time of \texttt{removeFirstHalf} if list is an ArrayList?
   c. (1 pt) What is the running time of \texttt{removeFirstHalf} if list is a LinkedList?
   d. (2 pts) Does using an iterator make \texttt{removeFirstHalf} faster for either type of list?