1. Implement a to do list for your tasks, using a priority queue. The tasks have a priority between 1 (int, the highest) and 9 (int, the lowest), and a short description (String). Your java program provides a few options. When the user chooses options "Opt 1. add a task", the program adds a new task. When the user chooses "Opt 2. show next task", the program prints the task with the highest priority (and then removes it from the queue). When the user chooses "Opt 3. quit" option, the program exits. The program should prompt the user if a bad/invalid option is chosen/entered. **[total 42 points]**

   Complete the files "ToDoList.java" and "Task.java" that are downloadable from Sakai. The breakdown of points for each class and methods are given in the java files.

   You may want to test your program with the following tasks with a priority and description:

   > 1 Complete this week's homework
   > 8 Read for tomorrow's class
   > 3 Soccer practice
   > 6 Call parents
   > 5 Have dinner with friends
   > 9 Sleep well

2. Develop a java class Polynomial that stores a polynomial such as

   $$p(x) = 5x^{10} + 9x^7 - x - 10$$

   as a linked list of terms. A term contains the coefficient and the power of x. For example, you would store p(x) as

   $$(5,10), (9,7), (-1,1), (-10,0)$$

   Complete the class Polynomial and the class Term files that are downloadable from Sakai. The breakdown of points for each class and methods are given in the java files. **[total 30 points]**

3. Java's built-in priority queue is implemented using heap. Complete the class MyPriorityQueue that is downloadable from Sakai, using linked list (instead of heap or array). Note that there are a few types of linked list – you may choose either of them, but NOT use the java built-in linked list. The breakdown of points for each class and methods are given in the java files. **[total 28 points]**