

Problem 2

Question 1

- Array Representation
 - Advantages
 - It does not need to have a specific field to represent each coefficient with its degree. The array index implies the exponents
 - It initializes all degree before each action, so there is less edge condition
 - Disadvantages
 - Zero poly is a special case under such representation. Each time we need to check both array and the degree field.
 - Not resizable: if we need to decrease/increase degree, we need to rebuild the whole array by copying each object into the new array
 - Overhead of high degrees: we need to fill 0 for non-existing degree. i.e x^{100} will create array size of 101 and only the last one will be filled
- List Representation
 - Advantages
 - List is resizable: we don't need to copy each element when increasing/decreasing degree
 - Zero is not special case: Zero can be identified by only look at the size of the list only
 - Disadvantages
 - Extra overhead: each item is an object that has its own fields
 - Extra access time: exponents may not be listed in order, or not created
 - Extra edge conditions when doing operation since objects are not created for non-existing exponents

Question 2

- Add the end of each constructors
 - it is the only place where a RatPoly may be invalid (there is no mutator in the class)
 - Each operations that creates new RatPoly will still go through constructors, which is rep checked as well