Assignment 1
CS202, ADSA

Impelement a resizable array class named **vector** in C++. The class must follow an object orieneted interface and should be a generic container (it should be a class template).
To asssist you with the design, we have provided you a **vector.hpp** file which contains a template for the vector class. All the functions which are declared in the class body must be implemented by you. In addition, your code must follow the guidelines given below:

- All the fields of the class (variables declared within the class body) should be **private.**
- The class must allocate all the memory in class **constructor** using **new**, and all the memory must be released using **delete** in the **destructor.**

The vector class consists of the following public functions: (Item is the type of value we are storing in the vector).
- vector();
- vector(const int& isize);
- vector(const int& isize, const Item& ival);
- ~vector();
- inline Item& operator[](const int& i);
- void push_back(const Item& item);
- bool empty();
- int size();
- void fill(const Item& item);

Bonus:
(1 mark) Make your vector class support iterators. You can choose any particular way of iterator design. One popular iterator design is given below:
Your class provides an iter() function. This function when called, returns an object of class vector_iterator. The returned object should support two methods, hasNext() and next().
- hasNext() when called on the object, returns a boolean value indicating whether there are any more elements in the vector.
- next() when called returns the next element in the vector.

(2 marks) Design your iterators to be compatiable with the iterators provided by the vector class defined in the C++ standard library. You can read about std::vector iterators on the following link under the **"Iterators"** section:
http://en.cppreference.com/w/cpp/container/vector