Homework 8

All the following assignments are selected from Gaddis edition 7. The purpose is that you practice with **subclasses (derived classes)**. First do the reading assignment; Sections 11.9 - 11.14 (pages 734-762). Run your code, submit the output and code too. Submit code in a separate, compliable file, do NOT include it in your pdf or text file.

1. Programming challenge 11.5, Palindrome Testing, page 769 [2 points].
2. Programming challenge 11.6, String Encryption, page 769 [2 points].

5. Palindrome Testing

A palindrome is a string that reads the same backward as forward. For example, the words *mom*, *dad*, *madam* and *radar* are all palindromes. Write a class `Pstring` that is derived from the STL `string` class. The `Pstring` class adds a member function

```
bool isPalindrome( )
```

that determines whether the string is a palindrome. Include a constructor that takes an STL `string` object as parameter and passes it to the `string` base class constructor. Test your class by having a main program that asks the user to enter a string. The program uses the string to initialize a `Pstring` object and then calls `isPalindrome()` to determine whether the string entered is a palindrome.

You may find it useful to use the subscript operator `[]` of the string class: if `str` is a string object and `k` is an integer, then `str[k]` returns the character at position `k` in the string.

6. String Encryption

Write a class `EncryptableString` that is derived from the STL `string` class. The `Encryptable` string class adds a member function

```
void encrypt( )
```

That encrypts the string contained in the object by replacing each letter with its successor in the ASCII ordering. For example, the string *baa* would be encrypted to *cbb*. Assume that all characters that are part of an `EncryptableString` object are letters `a`, .., `z` and `A`, .., `Z`, and that the successor of `z` is `a` and the successor of `Z` is `A`. Test your class with a program that asks the user to enter strings that are then encrypted and printed.