Lab 5

Goals-

Refine requirements for a program using inheritance

Implement the requirements using polymorphism and OOP

A file filter reads an input file, transforms it in some way, and writes the results to an output file. Write an abstract file filter class that defines a pure virtual function for transforming a character. Then create a subclass for each of these transformations:

1. creates an unchanged copy of the original file (to test your inheritance)
2. performs encryption
3. transforms a file to all uppercase
4. modify #2 output to be all uppercase and in 5 letter groups

The class should have a member function

```
void doFilter(ifstream &in, ofstream &out)
```

that is called to perform the actual filtering. The member function for transforming a single character should have the prototype

```
char transform(char ch)
```

The encryption class should have a constructor that takes an integer as an argument and uses it as the encryption key. Add the key to each character, take the result modulus 26 and write it to the output file.

NOTES: 1- Part one includes creating the base class. Please do it first! Save a copy. Then work on the others in order. As you get the new subclass working save a copy with a different name. This way you will not lose partial credit.

2- Part 4 is a combination of #2 and #3. Start it only after you have finished the other parts and safely put them in a different file. Ciphertext (non-computerized systems) typically is written in 5 letter blocks using all capital letters. Remember to remove blank characters and to insert a blank every 5 characters. What do you do with new line characters?

What to submit?

Your source code
Your makefile
One or more sample text files you used in testing
Submit all files in a zip file

Modular Grading

We are using modular grading. Each lab will be divided into specific modules. Each module will be graded pass/fail. It either works properly or it does not. 10% of every lab or assignment grade is style/comments or other elements of self-documenting code and clarity. Remember the labs are worth 10 points total.

Programming style- 1 point

Create the class hierarchy and demonstrate using the copy filter- 4 points

Create the encryption subclass- 2 points

Create the uppercase subclass- 2 points

Create the ciphertext output subclass- 1 points