

CCNU-UOW

CSCI851 Advanced Programming

Autumn 2020

Laboratory Exercise 13 (Week 13)

Prof. Zhifeng Wang

Note that lab exercises marked with a * are effectively extension exercises.

Last lab for the session. You can work on the assignment during this lab if you like, but it's a good idea to at least try these questions.

1. Consider the code in `Quote.cpp`. What concept does it illustrate and what does the quote refer to?
2. Write and use some enumerators to do the following:
 - (a) Take a rainbow colour as an argument to a function and print out the position of that colour in the rainbow in a sensible way.
 - (b) Make a collection of what would normally be independent global constants for a program. Demonstrate how you would now use them.

3. Write a stream manipulator to reverse the alphabet in an input file being read in using the direction operator. So if you read in an 'a' you output a 'z', and if you read in a 'b' you output a 'y', and so on. Anything that is not a lower case letter can be left unchanged.

The direction operator means that if the program is compiled to `reverse`, you process the file `Input.txt` using ...

```
$ ./reverse < Input.txt
```

This means you don't open a filestream you just get things from cin.

4. Write a program to take a phrase from standard in and test if it is a palindrome. Store the phrase in a `vector<char>` and use iterators to traverse it.
5. Write a wrapper class to represent integers mod 11. You should:
 - (a) Write an appropriate constructor that takes any integer but only constructs the integer mod 11. These means, for example, that whether we passed 19 or 8 to the constructor the same object would be generated.
 - (b) Overload the addition, subtraction, and multiplication operators to be consistent with those operations modulo 11. You can try to overload for division too, although if you were dealing with a different modulus you then have to be careful as to when it would actually be defined.

6. * The following is a valid C++11 program. See <http://www.drdobbs.com/cpp/lambda-in-c11/240168241> and <https://www.cprogramming.com/c++11/c++11-lambda-closures.html>.

```
int main(){([](){})({})({});}
```

7. Look at questions from the Spring 2017 exams, available from:

<https://ereadingsprd.uow.edu.au/listpage.php?prog=CSCI251>

Are there any particular areas you do not understand?

© Zhifeng Wang, CCNU-UOW, 2020.