



**Faculty of Engineering and Applied Science  
SOFE 3200U Systems Programming  
Lab Report 4**

**Group Member 1**

**Name:** Zachary Winn

**Student ID:** 100557505

**Group Member 3**

**Name:** Justin Kaipada

**Student ID:** 100590167

**Date:** 11/9/2017

**Lab Section CRN:** 44209

**Group Member 2**

**Name:** Logan Macdonald

**Student ID:** 100579606

**Group Member 4**

**Name:** Georgy Zakharov

**Student ID:** 100588814

## Questions

1. In <time.h>, there is a function `difftime()`. Why should we not use this function to time the operation of `generate()`?

The reason that we don't use the `difftime()` function in the operation `generate()` is because we are not trying to find the running time of the `generator()` file, but instead we are trying to find out the running time of our own written code, so putting the `difftime()` in `generator` would result in a running time of a function that we don't want to know.

To get the running time of the main lab code we use the `clock` function, then display the amount of `clocks_per_second` or running time. The function `difftime()` could have been used as an alternative.

2. What is the purpose of the `generator.h` file? Why is it necessary to have it?

A file with the `.h` extension is known as a header file which contains C function declarations and macro definitions which is used and shared with the source files. In this case functions are declared within the `generator.h` file which is used with the source `generator.c` file.

If a header file is included twice, the process will process the contents twice and result in an error. In this case to prevent this from occurring in the `generator.c` file the construct known as a wrapper `#ifndef` is included in the `generator.h` so when the header is included again in the file, the conditional will be false, because it is defined. The compiler will then skip over the second call to process.

## Lab Tasks

Source files are submitted in separate folders

## Group Participation

- **Justin:** Implemented task 2.
- **Logan:** Wrote main function for task 1 to utilize `generate()` function and time the operation.
- **Zach:** Put together the report and answered the question in part 1
- **Georgy:** Helped with Task 1, merged files to make the solution cleaner, added comments.