CT5102: Programing for Data Analytics

Assignment 11 (Optonal): Implementing a Closure in R

The aim of this assignment is to implement a closure (a *function with data).* The goal is to implement a simple timer with the following functions:

- start() – start the timer
- stop() – stop the timer
- get_time() – return the time elapsed
- get_state() – returns all the closure's state information

The closure must have error checking logic as follows (using defensive programming with R's stop() function)

1. stop()signals an error if the timer has not been started
2. get_time() signals an error if the timer has not been started and the stop time has not been recorded

Here is an example of how works:

(1) Create the timer closure.

```
> t <- timer()
> str(t$get_state())
List of 3
 $ Init  : POSIXct[1:1], format: "2018-11-12 10:52:24"
 $ Start : logi NA
 $ Finish: logi NA
```

(2) Check for error 1

```
> t$stop()
Error in t$stop() : Error, Cannot stop as timer was not started...
```

(3) Start the timer

```
> t$start()
> str(t$get_state())
List of 3
 $ Init  : POSIXct[1:1], format: "2018-11-12 10:52:24"
 $ Start : POSIXct[1:1], format: "2018-11-12 10:53:18"
 $ Finish: logi NA
```

(4) Check for error 2.

```
> t$get_time()
Error in t$get_time() : Error, Cannot get time as stop was not
called...
```

(5) Call the stop function and calculate the overall duration.

```
> t$stop()
> t$get_time()
Time difference of 174.6044 secs
```

Make use of the lubridate package for the function now(), and use the following to calculate the difference in seconds.

```
difftime(finish_time,start_time,units="secs")
```