# Introduction:

In this assignment we have to implement Smart Strings using 4 types of pointers

* Copied Pointers
* Owned Pointers
* Copy on Write with Reference Linking
* Copy on Write with Reference Count

# Implementation:

* The implementation of Copied Pointers Class is in StringBufferCP.h
* The implementation of Owned Pointer Class is in StringBufferOP.h
* The implementation of COW with Reference counting is in StringBufferCOWRC.h
* The implementation of COW with Reference linking is in StringBufferCOWRL.h
* Testing of all the implementation is done in Test.h

# Assumptions:

* In case of owned pointers the ownership gets transferred and the previous owner is assigned NULL value so it can neither write nor retrieve that value
* Reserve function is implemented such that if an attempt is made to reserve a buffer of already reserved string it creates a new buffer and copies the previous content of the buffer into this new buffer
* Length represents the size of the string and buffer represents the total size

# Running Approach:

* Download the project
* Open it in visual studio
* Run the main.cpp
* It will execute all the test cases and display the result

# Profiling Data:

* Copied Pointers required more resources and has highest memory foot print since deep copy is involved
* Owned Pointer requires least resources
* Reference Counting and Reference Linking approximately requires same amount of resource and only performs deep copy in case of write
* Profiling data is also included in the profile folder

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# GitHub Link: https://github.com/salmanali96/Assignment-2-Smart-Strings