

Object-oriented Programming

Section J,K Fall 2020

Assignment 2

Due Date: Tuesday, November 10, 2020

String

Implement a custom type for representing strings in C++. Allow following operations as well as operators, considering dynamic memory allocation:

Operations:

- length: determine the length of string
- upper: convert the string to upper case
- lower: convert the string to lower case
- at: return character at a given index
- substring: extract a substring given start and end
- index: find starting index of a substring
- compare: compare two strings
- concat: concatenate/append the argument after current string. Cater cases for different data types such as String, C-string, char, int, float
- prepend: concatenate/append the argument before current string. Cater cases for different data types such as String, char, int, float

Operators:

- + : for concatenation and prepend operations taking into account different data types and order of arguments
- = : for assignment
- ==, !=, < and > : for comparison operations
- [] : for access to character at a given index
- >> and << : for output and input a string

Roman Number

Implement a class to represent a Roman Number based upon the **Standard Form** described on the Wikipedia page (https://en.wikipedia.org/wiki/Roman_numerals). Support following operations using corresponding operators:

- + : for adding two roman numbers
- - : for subtracting two roman numbers
- * : for multiplication of two roman numbers
- / : for division of two roman numbers
- ==, !=, < and > : for relational comparison of two roman numbers
- ++ and -- : for increment and decrement, both prefix and postfix versions