

## CS-1004 Object Oriented Programming Spring-2024

**Question:** Your goal is implementing a “String” class with the following functions. You will need to write two files (String.h and String.cpp). Your implemented class must fully provide the definitions of following class (interface) functions. For naming the files, follow the convention mentioned at the beginning.

```
class String {
    // think about the private data members
public:
    // provide definitions of following functions
    String(); // default constructor
    String(const char *str); // initializes the string with constant c-string
    String(const String &); // copy constructor to initialize the string from the existing string
    String(int x); // initializes a string of predefined size

    char* getdata(); //returns the string inside the object

    // Binary Operators //
    // Sub-script Operators
    const char operator[](int i) const; // returns the character at index [x] //NOTE: in above [] operator functions if
    i=negative int value, print ith character from end //of string e.g. in case of “LOOP” if i=-1 OR i=3, it should return
    ‘P’ similarly i=-4 OR i=0, //return ‘L’

    // Arithmetic Operators
    String operator+(const String &str); // appends a String at the end of the String
    String operator+(const char &str); // appends a char at the end of the String
    String operator+(const char *str); // appends a String at the end of the String
    String operator-(const String &substr); //removes the substr from the String
    String operator-(const char &str); //removes all occurrences of char from the String
    String operator-(const char* str); //removes the str from the String

    // Assignment Operators
    String& operator=(const String&); // copies one String to another
    String& operator=(char*); // copies one c-string to another

    // Logical Operators
    bool operator==(const String&) const; // returns true if two Strings are equal
    bool operator==(const char *) const; // returns true if the c-string is equal to the String

    // Unary Operators //
    // Boolean Not Operator
    bool operator!(); // returns true if the String is empty

    // Function-Call Operators
    //If something is not found then return -1
    int operator()(char) const; // returns the first index of the character being searched
    int operator()(const String&) const; // returns the first index of the String being searched
    int operator()(const char*) const; // returns the index of the c-string being searched

    // Conversion Operator
    operator int() const; // returns the length of string
    ~String(); // destructor
};

ostream& operator<<(ostream& output, const String& str); // outputs the string
istream& operator>>(istream& input, String& str); // inputs the string
```