CS2400 Book Project, Part 1 Due: Monday April 22, 2019

50 Points

Objectives:

Design classes, search strings, tokenizing strings, string member functions, and separate compilation.

Important:

This is the first part of your final project. The Book class will be used in the second part of this project. ***Do not change the function names or their prototypes. Also, use the same file names given in the repository on GitHub (book.h, book.cc).***

You may use any function or library discussed in class or in the chapters we covered from your textbook. Do not use any other libraries or functions.

Design a class to keep track of a book. Each book has a *title*, *year*, and an *author*. Your class must include the following constructors and functions (**function names and prototype must match exactly**):

- `Book()`
  - A constructor that initializes a book to the default values: (`"***", 0, "***"`).
- `Book(string newTitle, int newYear, string newAuthor);`
  - A constructor that initializes a book's title, year, and author to the specified parameters.
- `Book(string allData)`
  - A constructor that splits the string specified (`allData`) into the three book properties. The string is in the following format:
    - `title|year|author`
    - Example: `"The Hitchhiker's Guide to the Galaxy|1979|Douglas Adams"`
- Setters (mutators) for all three member variables (e.g. `setTitle`)
- Getters (accessors) for all three member variables (e.g. `getTitle`)
- `bool matchTitle(string targetTitle)`
  - Returns `true` if `targetTitle` is part of the book title
  - Using the example above it should return `true` if `targetTitle` is `"galaxy"`, `"GUIDE tO"`, `"the hit"`, etc.
- `bool matchAuthor(string targetAuthor)`
  - Returns `true` if `targetAuthor` is part of the name of the lead author
  - Using the example above it should return true if `targetTitle` is `"Doug"`, `"LAS"`, `"aDaMs"`, etc.
- `bool matchYear(string targetYear)`
  - Returns `true` if `targetYear` matches any part of the year.
  - Using the example above it should return `true` if `targetYear` is `"79"`, `"19"`, or `"1979"` etc.
- `bool match(string target);`
  - Returns `true` if target can be found any where in the book member variables
    - Using the example above it should return `true` if target `is "97"`, `"douglas", "hitch",` etc.

Write a main program to test all the functions.

Project Files:

Divide your project into three files:

- `book.h`
    - Contains the class definition
- `book.cc`
    - Contains the class implementation (all the functions)
- `book_main.cc`
    - Main program to test your class

Compiling your project:

1. `g++ -Wall -c book.cc`
    - This creates the object file `book.o`
2. `g++ -Wall -c book_main.cc`
    - This creates the object file `book_main.o`
3. `g++ book.o book_main.o`
    - This creates the executable `a.out`

or

```
g++ -Wall -std=c++11 -c book.cc book_main.cc
```

There is a `Makefile` provided to allow you to compile your program using the command:

```
make
```

If you are using C++11 add the option `-std=c++11` to your compile commands.

Hints:

- Start early. You may start by putting everything in one file and separate them later.
- Implement the getters, and setters functions first then start implementing the *match* functions one at a time. Test every function immediately after you write it.
- You may want to implement an `output` function to test your objects.
- Review the *string* functions. They will be useful in this project.
- Write a function that converts a string to all lower case.
- The function `stoi` allows you to convert a string object to an integer. It requires compiling your program with `-std=c++11` option.

    `int x = stoi("123");` will return the integer 123
- The function `to_string` converts a number to string.

    `string s = to_string(123);` will set s to the string `"123"`
- For the third constructor, use the `find` and the `substr` string member functions.

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Grading:

Programs that contain syntax errors will earn zero points.
Programs that use global variables, other than constants, will earn zero points.
Programs that do not use separate files will earn zero points.

- (2 points) default constructor
- (2 points) second constructor
- (6 points) third constructor
- (6 points) getters and setters
- (28 points) match functions (7 points each)
- (6 points) Programming Style & documentation.

Follow the coding style outline on GitHub:
https://github.com/nasseef/cs2400/blob/master/docs/coding-style.md