

CS 2413 Data Structures – Spring 2016 – Programming Project 4

Due March 21, 2016 – 11:59 PM

Objectives

Implement the following methods for **MasterCell** data structure developed in Project 3.

1. [30 Points] `fineKeywords` returns an array of strings (character array) that matches an input (int) value. You need to search all the linked lists and return the `*_info` (keyword) that matches the input value.
2. [20 Points] `And` method takes two keywords and returns all the integers that are common to both.
3. [20 Points] `OR` method takes two keywords and returns all the integers that are in either of them.
4. [20 Points] `ExclusiveOR` method takes two keywords and returns all the integers that not common in both.
5. [10 Points] Document your project thoroughly as the examples in the textbook. This includes but not limited to header comments for all classes/methods, explanatory comments for each section of code, meaningful variable and method names, and consistent indentation.
6. **[BONUS: 30 Points]** Read a set of input lines (till eof is reached). Each line contains a Boolean queries with each of the keywords separated Boolean operators `&` (for And), `|` (for OR), and `%` (for Exclusive OR).

Project Description

Please note that you need to write you own `stringMatch` method. Consider below a set of input lines:

Operating Systems, 5 1000, 80, 1800 300 4999 5000

Compiler Construction, 3 30 1000 80

Theory of Computation, 2, 80, 1000

Database Management Systems, 3 20 10 40 90

Java Programs for Beginners, 2 41 31

Statistics Introduction, 3 88 75 26

Algorithms Analysis, 1 51 3 5 80

Here are some examples for various method executions.

findKeywords (3) – returns “Compiler Construction” and “Database Management Systems” and “Statistics Introduction”

And (“Compiler Construction”, “Theory of Computation”) – returns 80 and 1000

OR (“Compiler Construction”, “Theory of Computation”) – returns 3, 2, 30, 80, and 1000

ExclusiveOR (“Compiler Construction”, “Theory of Computation”) – returns 2, 3, 30

Bonus

Here are some examples input lines and output results are shown.

Operating Systems & Compiler Construction & Theory of Computation

Operating Systems | Database Management Systems & Algorithms Analysis

The output for the above input lines are:

1000, 80

3 5 80

Constraints

1. In this project, the only header you will use is `#include <iostream>`.
2. None of the projects is a group project. Consulting with other members of this class on programming projects is strictly not allowed and plagiarism charges will be imposed on students who do not follow this.