Data arrays lab functional specification

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| **Version** | **Date** | **Author** | **Comment** |
| **1** | 11.20.19 | Miroshnichenko Denys | Version 1.0 |

**TARGET WORKFLOW (Data arrays lab)**

**REQUIREMENTS**

Selected Data Structure type: **binary tree**;

1. Separate key value from data value (tree is built by the key values)
2. Implement the following functionality:
   1. Add element to structure (by key)
   2. Find element (by key)
   3. Find element (by value, moreover: user must choose between wide search and deep search)
   4. Delete element (by key)
   5. Delete element (by value, moreover: user must choose between wide search and deep search)
   6. Delete all elements from structure
   7. Copy structure, using overloaded assignment operator
   8. Iterate over all structure elements and apply some operation to them (using wide and deep iteration methods)
3. Implement a class, which will be used as value part of element/ This class should contain the following information for every student:
   1. Surname
   2. Name
   3. Patronymic
   4. Birth year
   5. Average mark
4. Implementation of class should contain the following features:
   1. Lack of direct access to class members
   2. Safe setting of field value (with memory allocation, if necessary)
   3. Safe memory deallocation (when destroying student data)
   4. Properties through which access to the class members is implemented
   5. Overload operators
      * =
      * == (based on surname, name and patronymic)
      * != (based on surname, name and patronymic)
      * >= (based on surname, name and patronymic)
      * <= (based on surname, name and patronymic)
      * < (based on surname, name and patronymic)
      * > (based on surname, name and patronymic)
      * Input/output, using streams
5. The data structure should be implemented, using template
6. Implement ‘group’ and ‘stream’ (we are talking about groups of students) classes
7. Both of this classes should contain:
   1. Group/Faculty name (is not accessible directly to the user)
   2. Pointer(s) required(e) for working with data structure, that stores information about a group of students (is not accessible directly to the user)

\*Information about group is deleted from the student data

1. Develop UI for project, using WinForms, UI should contain: menu, dialog boxes and accelerators

**DEVELOPMENT**

**Milestones and Estimation**

**TECHNOLOGIES**

**Development tools**

Visual Studio Community 2019