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Лабораторна робота 1

Тема. Розробка програм на C#. Консольні програми

Задачі:

1. Введення та збереження анкетних даних особистої справи студента вузу: П.І.Б., дата народження, дата надходження, індекс академ. групи (а, б...), фт, спеціальність, успішність (у%). Забезпечити валідацію даних, що вводяться.
2. Доступ до особистих полів реалізувати за допомогою властивостей класу, забезпечивши необхідні обчислення та перевірку коректності встановлюваних значень. Для спрощеного доступу використовувати властивості, що автоматично реалізуються.
3. Відображення введених даних.
4. Демонстрація роботи з масивами об'єктів.

Опис класів

Student – клас, який відображує студента;

Текст програми

Student.cs

```
using System;
using System.Runtime.Serialization;

namespace menshakov01
{
    /// <summary>
    /// Class Student
    /// class that models student
```

```
    /// contains student's fields and properties
    /// </summary>
    [DataContract]
    public sealed class Student
    {
        /// <summary>
        /// Private fields of a class
        /// </summary>
        private string _name;
        private string _surname;
        private string _patronymic;
        private DateTime _dateOfBirth;
        private DateTime _dateOfAdmission;
        private char _groupIndex;
        private string _faculty;
        private string _specialty;
        private int _academicPerformance;

       /// <summary>
       /// Constructor with 9 parameters
       /// </summary>
       /// <param name="surname"></param>
       /// <param name="name"></param>
       /// <param name="patronymic"></param>
       /// <param name="dateOfBirth"></param>
       /// <param name="dateOfAdmission"></param>
       /// <param name="groupIndex"></param>
       /// <param name="faculty"></param>
       /// <param name="specialty"></param>
       /// <param name="academicPerformance"></param>
        public Student(string surname, string name, string patronymic, DateTime dateO
fBirth, DateTime dateOfAdmission, char groupIndex,
            string faculty, string specialty, int academicPerformance)
        {
            Surname = surname;
            Name = name;
            Patronymic = patronymic;
            DateOfBirth = dateOfBirth;
            DateOfAdmission = dateOfAdmission;
            GroupIndex = groupIndex;
            Faculty = faculty;
            Specialty = specialty;
            AcademicPerformance = academicPerformance;
        }

        /// <summary>
        /// Public property Name
        /// </summary>
        [DataMember]
        public string Name
        {
            get
            {
                return _name;
            }

            set
            {
                if (value.Length < 2 && value.Length > 10)
                {
                    Console.WriteLine("You've entered wrong name\n");
```

```
            }
            else
            {
                _name = value;
            }
        }
    }

    /// <summary>
    /// Public property Surname
    /// </summary>

    [DataMember]
    public string Surname
    {
        get
        {
            return _surname;
        }

        set
        {
            if (value.Length < 2)
            {
                Console.WriteLine("You've entered wrong surname\n");
            }
            else
            {
                _surname = value;
            }
        }
    }

    /// <summary>
    /// Public property Patronymic
    /// </summary>

    [DataMember]
    public string Patronymic
    {
        get
        {
            return _patronymic;
        }

        set
        {
            if (value.Length < 2)
            {
                Console.WriteLine("You've entered wrong patronymic\n");
            }
            else
            {
                _patronymic = value;
            }
        }
    }

    /// <summary>
    /// Public property DateOfBirth
    /// </summary>
```

```
        [DataMember]
        public DateTime DateOfBirth
        {
            get
            {
                return _dateOfBirth;
            }

            set
            {
                if (value < new DateTime(2000, 1, 1) || value > DateTime.Today)
                {
                    Console.WriteLine("You've entered wrong date of birth\n");
                }
                _dateOfBirth = value;
            }
        }

        /// <summary>
        /// Public property DateOfAdmission
        /// </summary>

        [DataMember]
        public DateTime DateOfAdmission
        {
            get
            {
                return _dateOfAdmission;
            }

            set
            {
                if (value < new DateTime(2015, 1, 1) || value > DateTime.Today)
                {
                    Console.WriteLine("You've entered wrong date of admission\n");
                }
                _dateOfAdmission = value;
            }
        }

        /// <summary>
        /// Public property GroupIndex
        /// </summary>

        [DataMember]
        public char GroupIndex
        {
            get
            {
                return _groupIndex;
            }

            set
            {
                if (value < 97 || value > 122)
                {
                    Console.WriteLine("You've entered wrong group index\n");
                }
                else
                {
```

```
                _groupIndex = value;
            }
        }
    }

    /// <summary>
    /// Public property Faculty
    /// </summary>

    [DataMember]
    public string Faculty
    {
        get
        {
            return _faculty;
        }

        set
        {
            if (value.Length < 2)
            {
                Console.WriteLine("You've entered wrong faculty\n");
            }
            else
            {
                _faculty = value;
            }
        }
    }

    /// <summary>
    /// Public property Specialty
    /// </summary>

    [DataMember]
    public string Specialty
    {
        get
        {
            return _specialty;
        }

        set
        {
            if (value.Length < 3)
            {
                Console.WriteLine("You've entered wrong specialty\n");
            }
            else
            {
                _specialty = value;
            }
        }
    }

    /// <summary>
    /// Public property AcademicPerformance
    /// </summary>

    [DataMember]
    public int AcademicPerformance
```

```
        {
            get
            {
                return _academicPerformance;
            }

            set
            {
                if (_academicPerformance < 0 || _academicPerformance > 100)
                {
                    Console.WriteLine("You've entered wrong academic performance\n");
                }
                _academicPerformance = value;
            }
        }

        /// <summary>
        /// ToString method overriding
        /// </summary>
        /// <returns>Full data about student</returns>
        public override string ToString()
        {
            return $"Name: {Name}\nSurname: {Surname}\nPatronymic: {Patronymic}\nDate
 of birth: {DateOfBirth}\nDate of admission: {DateOfAdmission}\n" +
                $"Group index: {GroupIndex}\nFaculty: {Faculty}\nSpecialty: {Specialt
y}\nAcademic performance: {AcademicPerformance}%\n";
        }

        /// <summary>
        /// Equals method overriding
        /// </summary>
        /// <param name="obj"></param>
        /// <returns>If objects are equal returns true otherwise false</returns>
        public override bool Equals(object obj)
        {
            var other = obj as Student;
            return other != null && (Name, Surname, Patronymic).Equals((other.Name, o
ther.Surname, other.Patronymic));
        }

        /// <summary>
        /// GetHashCode method overriding
        /// </summary>
        /// <returns>Hashcode of an object</returns>
        public override int GetHashCode()
        {
            return (Name, Surname, Patronymic).GetHashCode();
        }
    }
}
```

Program.cs

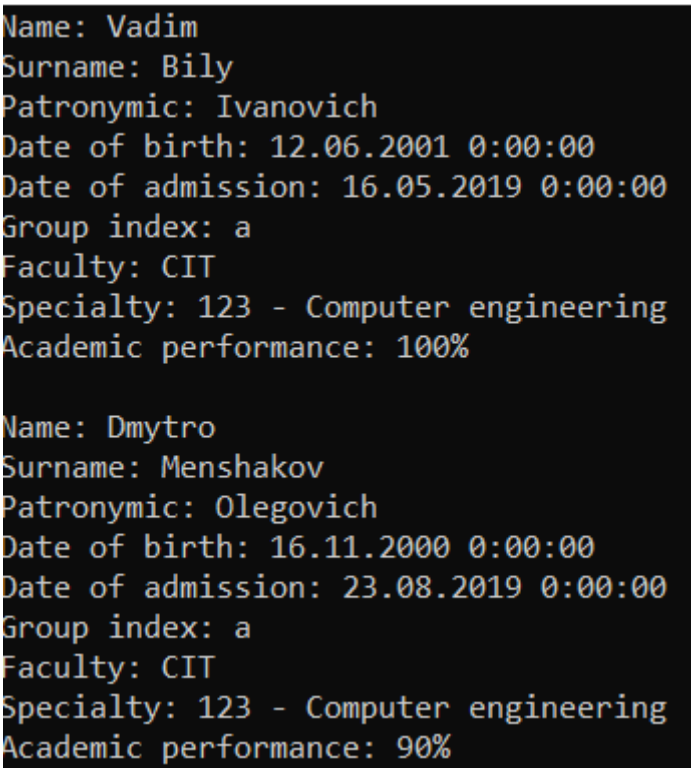
```
using System;

namespace menshakov01
{
    /// <summary>
    /// Class Program
    /// class that creates array of students
    /// and prints it in console
    /// </summary>
    class Program
    {
        static void Main(string[] args)
        {
            /*Console.WriteLine("Enter student's surname: ");
            string surname = Console.ReadLine();
            Console.WriteLine("Enter student's name: ");
            string name = Console.ReadLine();
            Console.WriteLine("Enter student's patronymic: ");
            string patronymic = Console.ReadLine();
            Console.WriteLine("Enter student's date of birth: ");
            string dateOfBirth = Console.ReadLine();
            Console.WriteLine("Enter student's date of admission: ");
            string dateOfAdmission = Console.ReadLine();
            Console.WriteLine("Enter student's group index: ");
            string groupIndex = Console.ReadLine();
            Console.WriteLine("Enter student's faculty: ");
            string faculty = Console.ReadLine();
            Console.WriteLine("Enter student's specialty: ");
            string specialty = Console.ReadLine();
            Console.WriteLine("Enter student's academic performance: ");
            string academicPerformance = Console.ReadLine();*/

            // Creating array of students
            var students = new Student[] { new Student("Bily", "Vadim", "Ivanovich",
DateTime.Parse("12-6-2001"), DateTime.Parse("16-05-2019"), 'a', "CIT", "123 -
 Computer engineering", 100),
                new Student("Menshakov", "Dmytro", "Olegovich", DateTime.Parse("16-
11-2000"), DateTime.Parse("23-8-2019"), 'a', "CIT", "123 -
 Computer engineering", 90)/*,
                new Student(name, surname, patronymic, DateTime.Parse(dateOfBirth), D
ateTime.Parse(dateOfAdmission), Convert.ToChar(groupIndex), faculty, specialty, Int32
.Parse(academicPerformance))*/};

            // Printing out students' data
            for (var i = 0; i < students.Length; i++)
            {
                Console.WriteLine(students[i].ToString());
            }

            Console.ReadLine();
        }
    }
}
```



Результати роботи програми

Висновок: у результаті виконання лабораторної роботи було створено клас Student, який відображує модель студента. Було створено масив таких об’єктів та виведено його у консоль.