МІНІСТЕРСТВО ОСВІТИ ТА НАУКИ УКРАЇНИ

Національний технічний університет України

"Київський політехнічний інститут імені Ігоря Сікорського"

Факультет інформатики та обчислювальної техніки

Лабораторна робота №4

з дисципліни «Об'єктно оріентовне програмування»

Тема: «**LINQ to Objects**»

Виконав:

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**Мета роботи**: ознайомитися з обробкою даних з використанням бібліотеки LINQ to Objects

**Хід роботи:**

**Варіант 3**

class Program

{

static List<Client> Clients = new List<Client>()

{

new Client(1,"John Andersson","London","2809825659"),

new Client(2,"Vasiliy Ivanov","Vena","4589562045"),

new Client(3,"Arseniy Markow","Krakow","7856235453"),

new Client(4,"Oleg Petrov","Kyiv","380985648216"),

new Client(5,"Ann Black","New York","356498562")

};

static List<Car> Cars = new List<Car>()

{

new Car(1,"Renault Dokker","Hatchback",10846,2013),

new Car(2,"Honda Accord X","Sedan",54580,2018),

new Car(3,"Volkswagen Caddy","Hatchback",17927,2010),

new Car(4,"Audi A8","Sedan",128721,2017),

new Car(5,"Opel Astra J","Hatchback",15841,2012),

new Car(6,"Mercedes-Benz Citan","Minibus",24692,2013)

};

static List<Transaction> Transactions = new List<Transaction>()

{

new Transaction(1,4,"01.06.20","26.06.20",500),

new Transaction(2,2,"01.05.19","12.05.19",200)

};

static void Main(string[] args)

{

Console.WriteLine("List of cars");

var q1 = from car in Cars

select car;

foreach (var car in q1)

Console.WriteLine(car);

Console.WriteLine("\n");

Console.WriteLine("List of clients");

var q2 = from client in Clients

select client;

foreach (var client in q2)

Console.WriteLine(client);

Console.WriteLine("\n");

Console.WriteLine("List of transactions");

var q3 = from transaction in Transactions

select transaction;

foreach (var client in q3)

Console.WriteLine(client);

Console.WriteLine("\n");

Console.WriteLine("All marks of cars");

var q4 = from car in Cars

select car.mark;

foreach (var car in q4)

Console.WriteLine(car);

Console.WriteLine("\n");

Console.WriteLine("List of available cars");

var q5\_5 = from transaction in Transactions

select transaction.carId;

var q5 = from car in Cars

where !q5\_5.Contains(car.id)

select car;

foreach (var car in q5)

Console.WriteLine(car);

Console.WriteLine("\n");

Console.WriteLine("List of hatchbacks");

var q6 = from car in Cars

where car.type == "Hatchback"

select car;

foreach (var car in q6)

Console.WriteLine(car);

Console.WriteLine("\n");

Console.WriteLine("List of sedans");

var q7 = from car in Cars

where car.type == "Sedan"

select car;

foreach (var car in q7)

Console.WriteLine(car);

Console.WriteLine("\n");

Console.WriteLine("List of other types");

var q8 = from car in Cars

where car.type != "Sedan" && car.type != "Hatchback"

select car;

foreach (var car in q8)

Console.WriteLine(car);

Console.WriteLine("\n");

Console.WriteLine("Cards sorted by price for hour");

var q9 = from car in Cars

orderby car.priceForDay

select car;

foreach (var car in q9)

Console.WriteLine(car);

Console.WriteLine("\n");

Console.WriteLine("Clients that renting cars");

var q10\_5 = (from transaction in Transactions

select transaction.clientId).Distinct();

var q10 = from client in Clients

where q10\_5.Contains(client.id)

select client;

foreach (var client in q10)

Console.WriteLine(client);

Console.WriteLine("\n");

Console.WriteLine("The chepiest one from available");

var f11 = (from car in q5 select car).First();

Console.WriteLine(f11);

Console.WriteLine("\n");

Console.WriteLine("The average price for a day");

var q12 = from car in Cars

select car.priceForDay;

Console.WriteLine(q12.Average());

Console.WriteLine("\n");

Console.WriteLine("When rented cars will be available");

var q13 = from car in Cars

from transation in Transactions

where car.id == transation.carId

select new { Car = car.mark, id = transation.carId, transation.finishDay };

foreach (var x in q13)

Console.WriteLine(x);

Console.WriteLine("\n");

Console.WriteLine("Amount of cars");

var f14 = (from car in Cars select car).Count();

Console.WriteLine(f14);

Console.WriteLine("\n");

Console.WriteLine("Clients sorted by Name");

var q15 = Clients.Where((client) =>

{

return true;

}).OrderBy(client => client.fullName);

foreach(var x in q15)

Console.WriteLine(x);

Console.WriteLine("\n");

}

}

public class Car

{

public int id;

public string mark;

public string type;

public int carPrice;

public int yearOfProdaction;

public int priceForDay;

public Car(int id,string m,string t,int cp,int yp)

{

this.id = id;

this.mark = m;

this.type = t;

this.carPrice = cp;

this.yearOfProdaction = yp;

this.priceForDay = (carPrice / 100) / (DateTime.Now.Year - this.yearOfProdaction);

}

public override string ToString()

{

return "(Mark: " + this.mark + "; Type: " + this.type +

"; Car price: " + this.carPrice + "; Year of production: "+ this.yearOfProdaction + "; Price for day:" + this.priceForDay + ")";

}

}

public class Client

{

public int id;

public string fullName;

public string adress;

public string phone;

public Client(int id,string fn,string a,string p)

{

this.id = id;

this.fullName = fn;

this.adress = a;

this.phone = p;

}

public override string ToString()

{

return "(Fullname: " + this.fullName + "; Adress: " + this.adress +

"; Phone number: " + this.phone + ")";

}

}

public class Transaction

{

public int clientId;

public int carId;

public string startDay;

public string finishDay;

public int deposit;

public Transaction(int clientid,int carid,string sd,string fd,int d)

{

this.clientId = clientid;

this.carId = carid;

this.startDay = sd;

this.finishDay = fd;

this.deposit = d;

}

public override string ToString()

{

return "(Client: " + this.clientId + "; Car: " + this.carId +

"; Start Day: " + this.startDay + "; Finish day:"+ this.finishDay + "; Deposit: "+ this.deposit + ")";

}

}

**Висновок:**Я засвоїв теоретичний матеріал з відповідної теми та закріпив його,виконавши практичні завдання.