שיעורי בית יסודות מערך עצמים – אופיר הופמן י'3

תרגיל 1

```
class Car
{
    private string num;
    private string model;
    private int year;

    public Car(string num, string model, int year)
    {
        this.num = num;
        this.model = model;
        this.year = year;
    }

    public string GetModel()
    {
        return this.model;
    }

    public int GetYear()
    {
        return this.year;
    }

    public bool Older(Car OtherCar)
    {
        return this.year < OtherCar.year;
    }

    public bool Equals(Car OtherCar)
    {
        return this.year == OtherCar.year;
    }

    public override string ToString()
    {
        string s = "Num: " + this.num + ", Model: " + this.model + ", Year " + this.year;
        return s;
    }
}

class UsedCars
{
    private const int MaxCars = 1000;
    private Car[] usedCars;
    private int empty;
    public UsedCars ()
    {
        this.usedCars = new Car[MaxCars];
    }

    public void AddCar(Car c)
```

```
        {
            if (empty < 1000)
            {
                usedCars[empty] = c;
                empty++;
            }
        }

        public void AddCar(string num, string model, int year)
        {
            Car car = new Car(num, model, year);
            AddCar(car);
        }

        public void PrintAllCarsProducedBefor(int year)
        {
            for (int i = 0; i < empty; i++)
            {
                if (usedCars[i].GetYear() < year)
                {
                    Console.Write(usedCars[i]);
                    Console.WriteLine();
                }
            }
        }

        public int HowMuch(string model)
        {
            int cnt = 0;
            for (int i = 0; i < empty; i++)
            {
                if (usedCars[i].GetModel() == model)
                    cnt++;
            }
            return cnt;
        }
    }

    static void Main(string[] args)
    {
        UsedCars uc = new UsedCars();
        uc.AddCar("90-123-56", "toyota", 2006);
        uc.AddCar("23-003-14", "ford", 2007);
        uc.AddCar("83-101-64", "mazda", 2008);
        Car c1 = new Car("13-501-36", "toyota", 2000);
        Car c2 = new Car("19-502-68", "mazda", 2009);
        uc.AddCar(c1);
        uc.PrintAllCarsProducedBefor(2008);
        Console.WriteLine(uc.HowMuch("toyota"));
    }
```

תרגיל 2

```
class Playlist
{
    private string name;
    private int length;
    private Song[] songs;

    public Playlist(string name)
    {
        this.name = name;
        this.songs = new Song[100];
        this.length = 0;
    }

    public bool AddSong(Song song)
    {
        if (length < 100)
        {
            songs[length] = song;
            length++;
            return true;
        }
        return false;
    }

    public bool AddSong(string name, string Singer, int length)
    {
        Song song = new Song(name, Singer, length);
        return AddSong(song);
    }

    public int OverAll()
    {
        int sum = 0;
        for (int i = 0; i < length; i++)
        {
            sum += songs[i].GetLength();
        }
        return sum;
    }

    public string Longest()
    {
        Song longestSong = songs[0];
        for (int i = 0; i < length; i++)
        {
            if (songs[i].GetLength() > longestSong.GetLength())
                longestSong = songs[i];
        }
        return longestSong.GetName();
    }
}
```

תרגיל 3

```
class CellPhone
{
    private string num;
    private string name;
    private bool isOnline;
    private CellPhone[] incomingCalls;
    private CellPhone[] outgoingCalls;
    private int numOfIncoming;
    private int numOfOutgoing;


    public CellPhone(string num, string name, bool isOnline)
    {
        this.num = num;
        this.name = name;
        this.isOnline = isOnline;
        incomingCalls = new CellPhone[100];
        outgoingCalls = new CellPhone[100];
        numOfIncoming = 0;
        numOfOutgoing = 0;
    }

    public void SetNum(string num)
    {
        this.num = num;
    }

    public void SetName(string name)
    {
        this.name = name;
    }

    public void set_isOnline(bool isOnline)
    {
        this.isOnline = isOnline;
    }

    public string GetNum()
    {
        return this.num;
    }

    public string GetName()
    {
        return this.name;
    }

    public bool Get_isOnline()
    {
        return this.isOnline;
    }

    public CellPhone[] GetIncomingCalls()
    {
        return this.incomingCalls;
    }

    public CellPhone[] GetOutgoingCalls()
    {
        return this.outgoingCalls;
    }

    public int GetNumOfIncoming()
    {
        return this.numOfIncoming;
    }

    public int GetNumOfOutgoing()
    {
        return this.numOfOutgoing;
    }

    public override string ToString()
    {
        string s = "Name: " + this.name + ", number: " + this.num + ", Is Online: 
" + this.isOnline + ", Incoming calls: " + numOfIncoming + ", Outgoing calls: " + 
numOfOutgoing;
        return s;
    }

    public void MakeCall(CellPhone ToCell)
    {
        outgoingCalls[numOfOutgoing] = ToCell;
        numOfOutgoing++;
    }

    public void GetCall(CellPhone fromCell)
    {
        incomingCalls[numOfIncoming] = fromCell;
        numOfIncoming++;
    }
}


internal class Program
{

    public static void Call(CellPhone phone1, CellPhone phone2)
    {
        if (phone1 != phone2)
        {
            phone1.MakeCall(phone2);
            phone2.GetCall(phone1);
        }
    }

    static void Main(string[] args)
    {
        CellPhone[] cellphones = new CellPhone[10];

        CellPhone cell1 = new CellPhone("0547783489", "avi", true);
        cellphones[0] = cell1;
        CellPhone cell2 = new CellPhone("0573385987", "Yossi", true);
        cellphones[1] = cell2;
        CellPhone cell3 = new CellPhone("0526670728", "Moshe", true);
        cellphones[2] = cell3;
        CellPhone cell4 = new CellPhone("0558908395", "Alon", false);
        cellphones[3] = cell4;
        CellPhone cell5 = new CellPhone("0537894783", "Yaron", true);
        cellphones[4] = cell5;
        CellPhone cell6 = new CellPhone("0532787789", "Refael", true);
        cellphones[5] = cell6;
        CellPhone cell7 = new CellPhone("0527784950", "Moti", true);
        cellphones[6] = cell7;
        CellPhone cell8 = new CellPhone("0557783957", "Amnon", false);
        cellphones[7] = cell8;
        CellPhone cell9 = new CellPhone("0527780909", "Adam", true);
        cellphones[8] = cell9;
        CellPhone cell10 = new CellPhone("0547789457", "Yotam", true);
        cellphones[9] = cell10;

        for (int i = 0; i < cellphones.Length; i++)
        {
            Console.WriteLine(cellphones[i]);
        }

        Random rnd = new Random();

        for (int i = 0; i < 100; i++)
        {
            CellPhone phone1 = cellphones[rnd.Next(10)];
            CellPhone phone2 = cellphones[rnd.Next(10)];

            if (phone1 == phone2)
                i++;

            else
            {
                Call(phone1, phone2);
            }

        }

        CellPhone maxIncoming = cellphones[0];
        CellPhone minOutgoing = cellphones[0];
        for (int i = 0; i < cellphones.Length; i++)
        {
            if (cellphones[i].GetNumOfIncoming() > 
maxIncoming.GetNumOfIncoming())
                maxIncoming = cellphones[i];

            else if (cellphones[i].GetNumOfOutgoing() < 
minOutgoing.GetNumOfOutgoing())
                minOutgoing = cellphones[i];
        }

        Console.WriteLine("The most Incoming calls: " + maxIncoming.GetName());
        Console.WriteLine("Calls list:");
        for (int i = 0; i < maxIncoming.GetNumOfIncoming(); i++)
        {
            Console.WriteLine(maxIncoming.GetIncomingCalls()[i].GetName());
        }

        Console.WriteLine("The list Outgoing calls: " + minOutgoing.GetName());
        Console.WriteLine("Calls list:");
        for (int i = 0; i < minOutgoing.GetNumOfOutgoing(); i++)
        {
            Console.WriteLine(minOutgoing.GetOutgoingCalls()[i].GetName());
        }
    }
}
```