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```

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

using Newtonsoft.Json;

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namespace NXTBlocks.Blockchain.Demo04
{
    class Program
    {
        static void Main(string[] args)
        {
            AssemblyInfoHelper helper = new AssemblyInfoHelper(typeof(Program));

            Console.WriteLine(helper.Title);
            Console.WriteLine("Released on December 20, 2018 (AssemblyVersion: " + helper.FileVersion + ")");
            Console.WriteLine("Description: " + helper.Description);

            Console.WriteLine("\n--- Begin Of Demo ---");
        }
    }
}
```

```
var startTime = DateTime.Now;

Blockchain myBlockchain = new Blockchain();

myBlockchain.AddBlock(new Block(DateTime.Now, null, "{sender:Alice,receiver:Bob,amount:10}"));
myBlockchain.AddBlock(new Block(DateTime.Now, null, "{sender:Alice,receiver:Bob,amount:20}"));
myBlockchain.AddBlock(new Block(DateTime.Now, null, "{sender:Alice,receiver:Bob,amount:30}"));

var endTime = DateTime.Now;

var Duration = endTime - startTime;

Console.WriteLine(string.Format("\nDuration: {0}", Duration));

Console.WriteLine("\n" + JsonConvert.SerializeObject(myBlockchain, Formatting.Indented));

Console.WriteLine(string.Format("\nIs Chain Valid: {0}", myBlockchain.IsValid().ToString()));

Console.WriteLine("\nUpdate amount to 100");

myBlockchain.Chain[1].Data = "{sender:Alice,receiver:Bob,amount:100}";

Console.WriteLine(string.Format("\nIs Chain Valid: {0}", myBlockchain.IsValid().ToString()));

Console.WriteLine("\nUpdate hash");

myBlockchain.Chain[1].Hash = myBlockchain.Chain[1].CalculateHash();

Console.WriteLine(string.Format("\nIs Chain Valid: {0}", myBlockchain.IsValid().ToString()));

Console.WriteLine("\nUpdate the entire chain");

startTime = DateTime.Now;

for (var i = 1; i < myBlockchain.Chain.Count; i++)
{
```

```
        Console.WriteLine(string.Format("\nUpdating block #{0}", myBlockchain.Chain[i].Index.ToString()));
        myBlockchain.Chain[i].PreviousHash = myBlockchain.Chain[i-1].Hash;
        myBlockchain.Chain[i].Hash = myBlockchain.Chain[i].CalculateHash();
        Console.WriteLine("Index = {0}\nTimeStamp = {1}\nPreviousHash = {2}\nHash = {3}\nData = {4}",
            myBlockchain.Chain[i].Index, myBlockchain.Chain[i].TimeStamp, myBlockchain.Chain[i].PreviousHash,
            myBlockchain.Chain[i].Hash, myBlockchain.Chain[i].Data);
    }

    endTime = DateTime.Now;

    Duration = endTime - startTime;

    Console.WriteLine(string.Format("\nDuration: {0}", Duration));

    Console.WriteLine(string.Format("\nIs Chain Valid: {0}", myBlockchain.IsValid().ToString()));

    Console.WriteLine("\n" + JsonConvert.SerializeObject(myBlockchain, Formatting.Indented));

    Console.WriteLine("\n--- End Of Demo ---");

    Console.Write("\nPress Enter key to continue...");

    Console.ReadLine();
}
}
```