(T8)比較 Enum、EnumGetValue、EnumGetNames
CourseGUID: 29f1196a-1950-41a4-b9c1-dd13a9e92d92

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(T8)比較 Enum、EnumGetValue、EnumGetNames

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0. Summary
1. Create New Project
2. Program

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0. Summary

1.
Enum

1.1.
Using Enum keyword to create enumerations and it is strongly value typed constants.
The default underlying type of an enum is int.
You may use " : short " to set the underlying type of an enum is short.
The default value for first element is ZERO and gets incremented by 1.

1.2.
Syntax :

```
//public enum EnumName  [ : underlyingType ]
//{
//    EnumValue1 [ = StarValue],
//    EnumValue2,
//    EnumValue3 [ = SpecificValue],
//    ....
//}
```

E.g.1.

```
//public enum MagicType   // : int
//{
//    Wood,
//    Fire,
//    Earth,
//    Metal,
//    Water
//}
```

E.g.2.

```
//public enum MagicType2 : short
//{
//    Wood = 5,
//    Fire,   //6
//    Earth   //7
//}
```

E.g.3.

```
//public enum MagicType4 : short
```

```
//{
//    Wood = 8,
//    Fire = 100,
//    Earth = 20
//}
```

1.3.

```
//int woodInt = (int)MagicType.Wood;
```

Convert Enum to int

1.4.

```
//MagicType magicType1 = (MagicType)1;
```

Convert int to Enum

1.5.

Enum.GetValues list Enum underlying type values.

E.g.

```
int[] MagicTypeValues = (int[])Enum.GetValues(typeof(MagicType));
//MagicTypeValues == {0,1,2,3,4}
```

1.6.

Enum.GetNames list Enum underlying type names.

```
string[] MagicTypeNames = Enum.GetNames(typeof(MagicType));
//MagicTypeNames == {"Wood","Fire","Earth","Metal","Water"}
```

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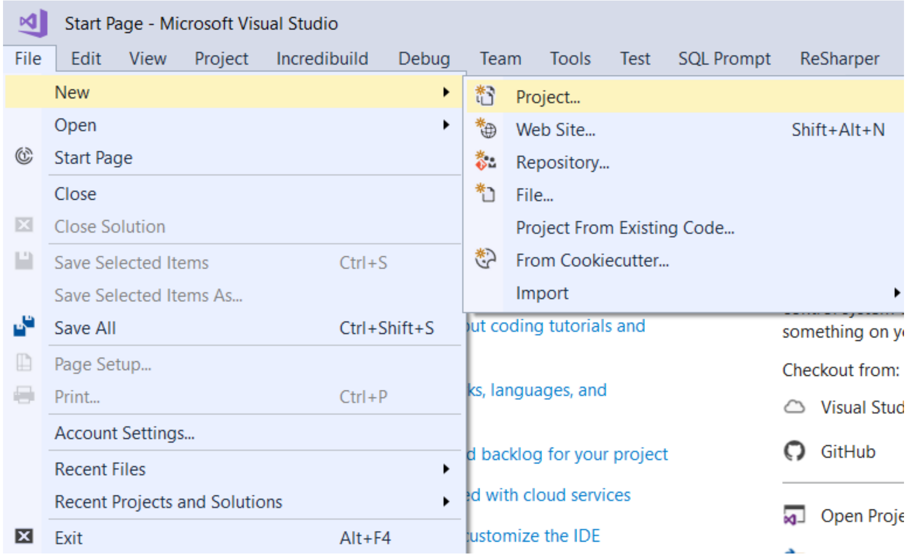
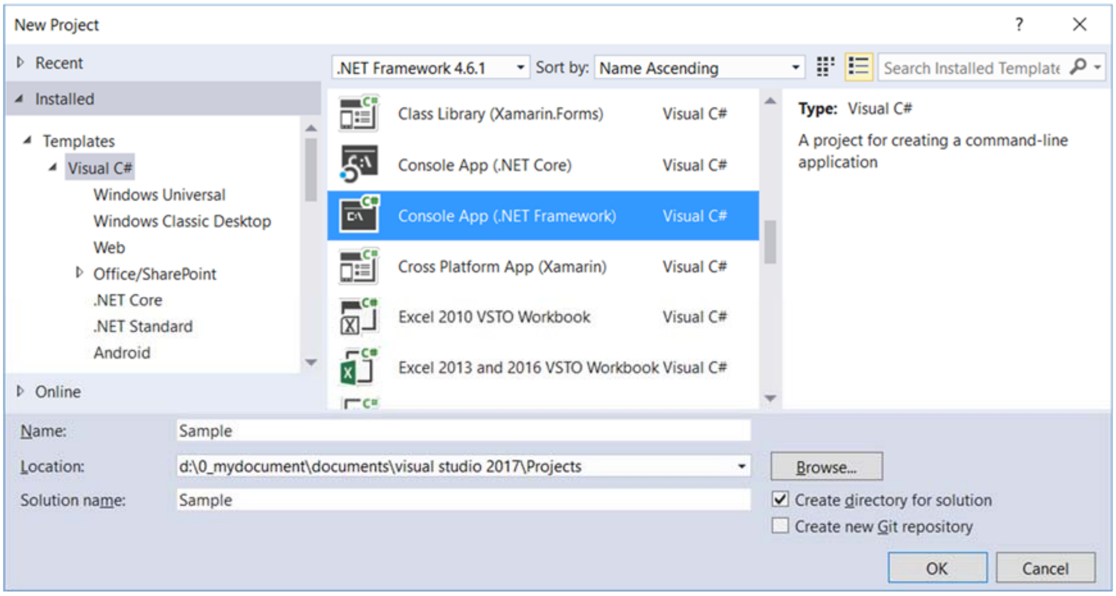
1. Create New Project

File --> New --> Project... -->

Visual C# --> **Console App (.Net Framework)** -->

Name: **Sample**

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Type: Visual C#

A project for creating a command-line application

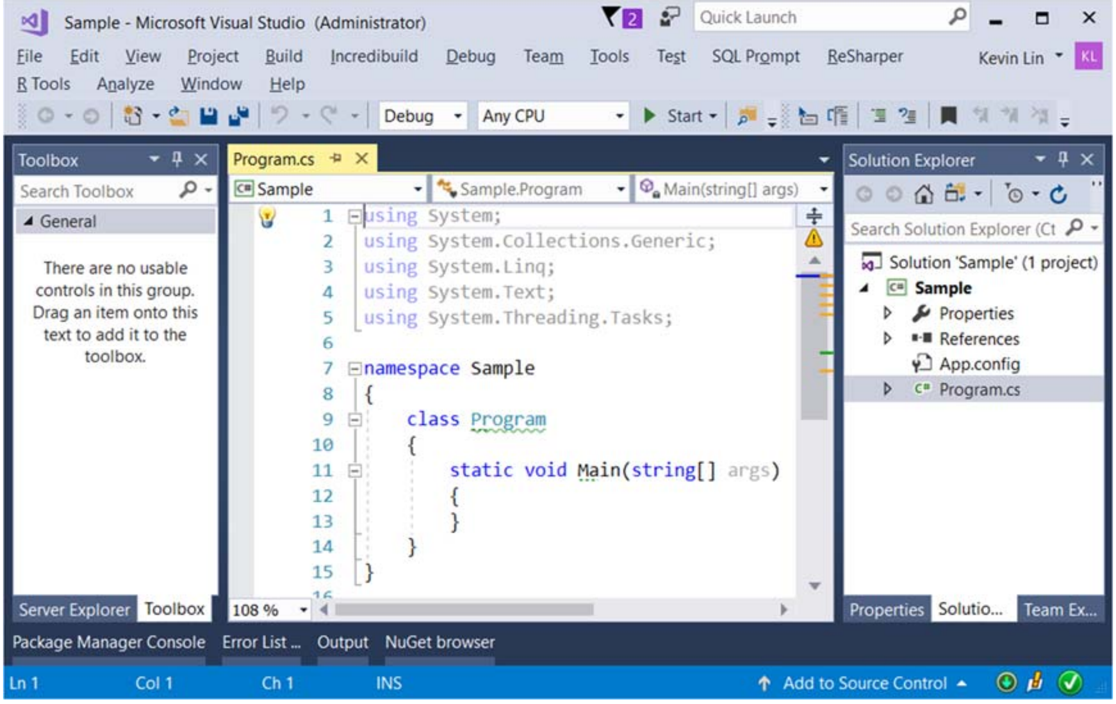
Name: Sample

Location: d:\0_mydocument\documents\visual studio 2017\Projects

Solution name: Sample

☑ Create directory for solution

□ Create new Git repository



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

namespace Sample
{
    class Program
    {
        static void Main(string[] args)
        {
        }
    }
}
```

===

2. Program

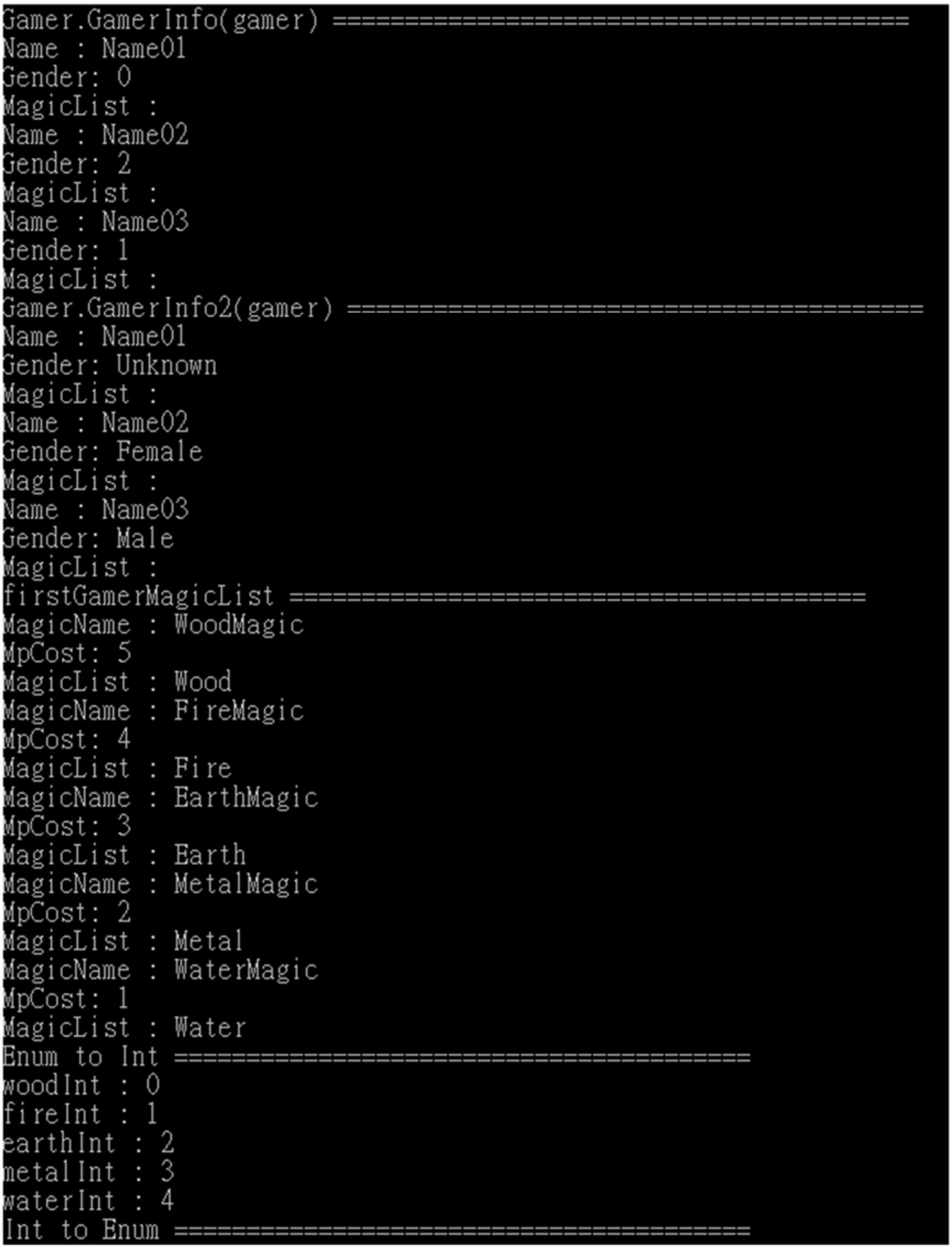
```
using System;
using System.Collections.Generic;
using System.Linq;
using OnLineGame;
namespace Sample
{
    class Program
     {
         static void Main(string[] args)
```

```
        {
            Console.WriteLine("Gamer.GamerInfo(gamer) ========================================");
            List<Gamer> gamerList = new List<Gamer>();
            gamerList.Add(new Gamer { Name = "Name01", Gender = 0 });
            gamerList.Add(new Gamer { Name = "Name02", Gender = 2 });
            gamerList.Add(new Gamer { Name = "Name03", Gender = 1 });
            foreach (Gamer gamer in gamerList)
            {
                Console.WriteLine(Gamer.GamerInfo(gamer));
            }
            ////Name: Name01
            ////Gender: 0
            ////MagicList:
            ////Name: Name02
            ////Gender: 2
            ////MagicList:
            ////Name: Name03
            ////Gender: 1
            ////MagicList:
            //how do I know what does "Gender: 1" mean?
            Console.WriteLine("Gamer.GamerInfo2(gamer) ========================================");
            foreach (Gamer gamer in gamerList)
            {
                Console.WriteLine(Gamer.GamerInfo2(gamer));
            }
            ////Name: Name01
            ////Gender: Unknown
            ////MagicList :
            ////Name: Name02
            ////Gender: Female
            ////MagicList :
            ////Name: Name03
            ////Gender: Male
            ////MagicList :
            //I have to use Gamer.GetGender(int gender) method to know the meaning.
            //It is totally un-readable. Thus, we need enum.
            Console.WriteLine("firstGamerMagicList ========================================");
            List<Magic> firstGamerMagicList = new List<Magic>();
            firstGamerMagicList.Add(new Magic { MagicName = "WoodMagic", MpCost = 5, MagicType
= MagicType.Wood });
            firstGamerMagicList.Add(new Magic { MagicName = "FireMagic", MpCost = 4, MagicType
= MagicType.Fire });
            firstGamerMagicList.Add(new Magic { MagicName = "EarthMagic", MpCost = 3, MagicType
= MagicType.Earth });
            firstGamerMagicList.Add(new Magic { MagicName = "MetalMagic", MpCost = 2, MagicType
= MagicType.Metal });
            firstGamerMagicList.Add(new Magic { MagicName = "WaterMagic", MpCost = 1, MagicType
= MagicType.Water });
            //MagicType = MagicType.Wood   is more readable.
            gamerList.First().MagicList = firstGamerMagicList;
            foreach (Magic magic in gamerList.First().MagicList)
            {
                Console.WriteLine(Magic.MagicInfo(magic));
            }
```

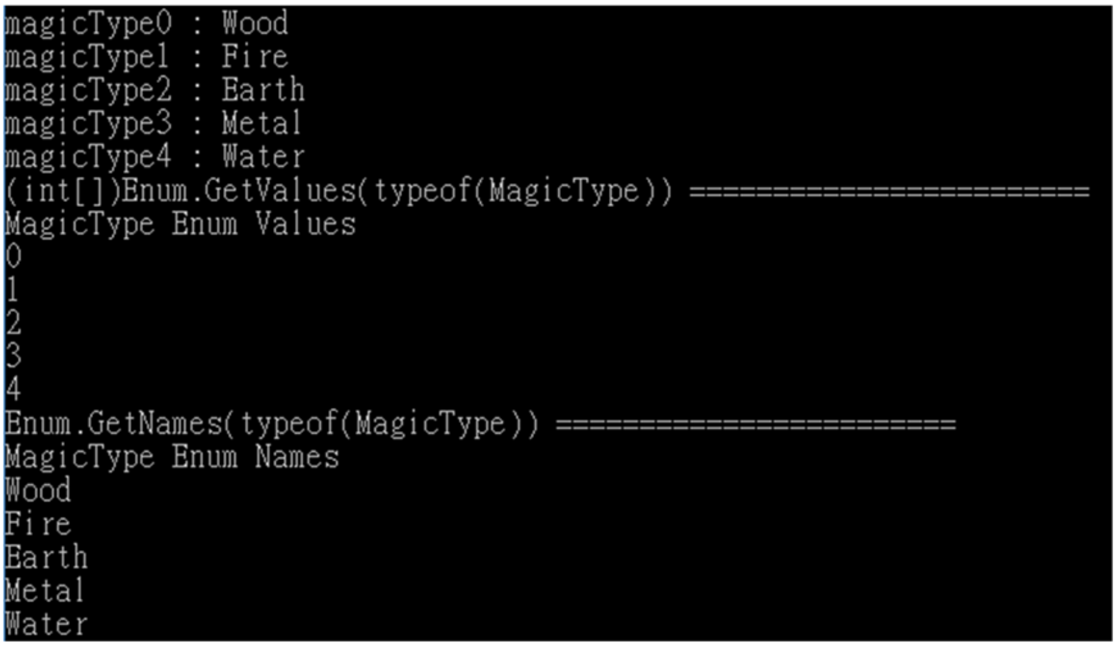
```
////MagicName: WoodMagic
////MpCost: 5
////MagicList: Wood
////MagicName : FireMagic
////MpCost: 4
////MagicList: Fire
////MagicName : EarthMagic
////MpCost: 3
////MagicList: Earth
////MagicName : MetalMagic
////MpCost: 2
////MagicList: Metal
////MagicName : WaterMagic
////MpCost: 1
////MagicList: Water
// The code is readable, and the return is readable.
Console.WriteLine("Enum to Int ========================================");
int woodInt = (int)MagicType.Wood;
int fireInt = (int)MagicType.Fire;
int earthInt = (int)MagicType.Earth;
int metalInt = (int)MagicType.Metal;
int waterInt = (int)MagicType.Water;
Console.WriteLine($"woodInt : {woodInt} \n" +
                  $"fireInt : {fireInt} \n" +
                  $"earthInt : {earthInt} \n" +
                  $"metalInt : {metalInt} \n" +
                  $"waterInt : {waterInt}");
//woodInt: 0
//fireInt: 1
//earthInt: 2
//metalInt: 3
//waterInt: 4
Console.WriteLine("Int to Enum ========================================");
MagicType magicType0 = 0;   // When 0, you don't need cast keyword "(MagicType)"
MagicType magicType1 = (MagicType)1;
MagicType magicType2 = (MagicType)2;
MagicType magicType3 = (MagicType)3;
MagicType magicType4 = (MagicType)4;
Console.WriteLine($"magicType0 : {magicType0} \n" +
                  $"magicType1 : {magicType1} \n" +
                  $"magicType2 : {magicType2} \n" +
                  $"magicType3 : {magicType3} \n" +
                  $"magicType4 : {magicType4}");
//magicType0: Wood
//magicType1 : Fire
//magicType2 : Earth
//magicType3 : Metal
//magicType4 : Water
Console.WriteLine("(int[])Enum.GetValues(typeof(MagicType)) ========================");
int[] MagicTypeValues = (int[])Enum.GetValues(typeof(MagicType));
Console.WriteLine("MagicType Enum Values");
foreach (int value in MagicTypeValues)
{
```

```
                Console.WriteLine(value);
            }
            ////MagicType Enum Values
            ////0
            ////1
            ////2
            ////3
            ////4
            //(int[])Enum.GetValues(typeof(MagicType))   list Enum underlying type values
            Console.WriteLine("Enum.GetNames(typeof(MagicType)) ========================");
            string[] MagicTypeNames = Enum.GetNames(typeof(MagicType));
            Console.WriteLine("MagicType Enum Names");
            foreach (string name in MagicTypeNames)
            {
                Console.WriteLine(name);
            }
            ////MagicType Enum Names
            ////Wood
            ////Fire
            ////Earth
            ////Metal
            ////Water
            //Enum.GetNames(typeof(MagicType))  list Enum underlying type names
            Console.ReadLine();
        }
    }
}

namespace OnLineGame
{
    public class Gamer
    {
        public string Name { get; set; }
        public int Gender { get; set; }
        public List<Magic> MagicList { get; set; }
        public static string GetGender(int gender)
        {
            switch (gender)
            {
                case 0:
                    return "Unknown";
                case 1:
                    return "Male";
                case 2:
                    return "Female";
                default:
                    //Run default only if the value does not match any of case.
                    return "Invalid";
            }
        }
        public static string GamerInfo(Gamer gamer)
        {
            return $"Name : {gamer.Name} \nGender: {gamer.Gender} \nMagicList : {gamer.MagicList} ";
        }
        public static string GamerInfo2(Gamer gamer)
        {
            return $"Name : {gamer.Name} \nGender: {GetGender(gamer.Gender)} \nMagicList : {gamer.MagicList}
";
        }
    }
    public class Magic
    {
        public string MagicName { get; set; }
        public int MpCost { get; set; }
        public MagicType MagicType { get; set; }
        public static string MagicInfo(Magic magic)
        {
            return $"MagicName : {magic.MagicName} \nMpCost: {magic.MpCost} \nMagicType : {magic.MagicType} "
;
        }
    }
    public enum MagicType   // : int
    {
        Wood,
        Fire,
        Earth,
        Metal,
        Water
    }
    public enum MagicType2 : short
    {
        Wood = 5,
        Fire,   //6
        Earth   //7
    }
    public enum MagicType3 : short
    {
        Wood = 8,
        Fire = 9,
        Earth = 10
    }
    public enum MagicType4 : short
    {
        Wood = 8,
        Fire = 100,
        Earth = 20
    }
}

/*
1.
Enum
---------------------
1.1.
Using Enum keyword to create enumerations and it is strongly value typed constants.
The default underlying type of an enum is int.
You may use " : short " to set the underlying type of an enum is short.
The default value for first element is ZERO and gets incremented by 1.
---------------------
1.2.
Syntax :
//public enum EnumName  [ : underlyingType ]
//{
//    EnumValue1 [ = StarValue],
//    EnumValue2,
//    EnumValue3 [ = SpecificValue],
//    ....
//}
E.g.1.
```

```
//public enum MagicType   // : int
//{
//    Wood,
//    Fire,
//    Earth,
//    Metal,
//    Water
//}
E.g.2.
//public enum MagicType2 : short
//{
//    Wood = 5,
//    Fire,   //6
//    Earth   //7
//}
E.g.3.
//public enum MagicType4 : short
//{
//    Wood = 8,
//    Fire = 100,
//    Earth = 20
//}
---------------------
1.3.
//int woodInt = (int)MagicType.Wood;
Convert Enum to int
---------------------
1.4.
//MagicType magicType1 = (MagicType)1;
Convert int to Enum
---------------------
1.5.
Enum.GetValues list Enum underlying type values.
E.g.
int[] MagicTypeValues = (int[])Enum.GetValues(typeof(MagicType));
//MagicTypeValues == {0,1,2,3,4}
---------------------
1.6.
Enum.GetNames list Enum underlying type names.
string[] MagicTypeNames = Enum.GetNames(typeof(MagicType));
//MagicTypeNames == {"Wood","Fire","Earth","Metal","Water"}
*/
```



```
Gamer.GamerInfo(gamer) ========================================
Name : Name01
Gender: 0
MagicList :
Name : Name02
Gender: 2
MagicList :
Name : Name03
Gender: 1
MagicList :
Gamer.GamerInfo2(gamer) ========================================
Name : Name01
Gender: Unknown
MagicList :
Name : Name02
Gender: Female
MagicList :
Name : Name03
Gender: Male
MagicList :
firstGamerMagicList ========================================
MagicName : WoodMagic
MpCost: 5
MagicList : Wood
MagicName : FireMagic
MpCost: 4
MagicList : Fire
MagicName : EarthMagic
MpCost: 3
MagicList : Earth
MagicName : MetalMagic
MpCost: 2
MagicList : Metal
MagicName : WaterMagic
MpCost: 1
MagicList : Water
Enum to Int ========================================
woodInt : 0
fireInt : 1
earthInt : 2
metalInt : 3
waterInt : 4
Int to Enum ========================================
```



```
magicType0 : Wood
magicType1 : Fire
magicType2 : Earth
magicType3 : Metal
magicType4 : Water
(int[])Enum.GetValues(typeof(MagicType)) ========================
MagicType Enum Values
0
1
2
3
4
Enum.GetNames(typeof(MagicType)) ========================
MagicType Enum Names
Wood
Fire
Earth
Metal
Water
```