**2\_4如何定义静态方法，静态方法有何特点？**

用static修饰的方法是仅属于类的静态方法。与此同时，不用static修饰的方法，则为实例方法。  
静态方法的本质是该方法是属于整个类的，不是属于某个实例的；静态方法效率上要比实例化高，但静态方法的缺点是不自动进行销毁，这可能会造成内存资源的浪费，而实例化的则可以做销毁；静态方法和静态变量创建后始终使用同一块内存空间，而使用实例的方式则会创建多个内存空间。

**2\_8 什么是访问控制符?有哪些访问控制符?哪些可以用来修饰类?哪些用来修饰域和方法?试述不同访问控制符的作用。**

访问控制符是一组限定类、域或方法是否可以被程序里的其他部分访问和调用的修饰符。  
C# 中的访问控制符有5个，其中基本的有4个：public,protected,private,internal，还有一个复合的修饰符protected internal（也可以写成internal protected）。  
类的访问控制符只有一个public，域和方法的访问控制符有五个，分别是public、private、protected、internal、protected internal。  
访问控制符表（"Yes"表示可以访问）



# 3\_1 编写一个C#程序定义一个表示学生的类student，包括域“学号”“班号”“姓名”“性别”“年龄”；方法“获得学号”“获得班号”“获得性别”“获得年龄”“修改年龄”。

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace \_3\_1

{

    class Program

    {

        static void Main(string[] args)

        {

            Student stu = new Student();

            stu.setAge(20);

            Console.WriteLine(stu.getAge());

            Console.ReadKey();

        }

    }

    public class Student

    {

        //域（Field），就是字段

        //编写一个C#程序定义一个表示学生的类student，包括域“学号”“班号”“姓名”“性别”“年龄”；方法“获得学号”“获得班号”“获得性别”“获得年龄”“修改年龄”。

        public string SN;

        public string getSN(){ return SN; }

        public string CN;

        public string getCN() { return CN; }

        public string Name;

        public string getName() { return Name; }

        public string Sex;

        public string getSex() { return Sex; }

        public double Age;

        public double getAge() { return Age; }

        public void setAge(double v) { Age=v; }

    }

}

# 3\_2 综合练习：编写银行ATM程序。要求如下

（1） 使用面向对象的思想，模拟现实世界中的银行、账号、ATM等对象，其中类中有字段、方法；  
（2）在程序中适当的地方，使用属性、索引器，注意使用修饰符；  
（3）使用继承，继承账号（Account类）得到一个子类（如信用账号），增加字段（如信用额度）、属性、方法，覆盖（override）一些方法（如WithdrawMoney）。  
（4）根据程序的需要（可选做），使用C#的其他语法成分，诸如：接口、结构、枚举等。  
（5）程序中加上适当的注释，并加一个说明文件，简要描述在什么地方使用了一些特殊的语法要素。

using System;

namespace \_3\_2\_综合练习\_编写银行ATM程序

{

    class Account

    {

        //Constructor

        Account() { }

        Account(long bank\_cardID, string password)

        {

            this.bank\_cardID = bank\_cardID;

            this.account\_password = password;

        }

        //fields

        private static long initial\_ID = 1000000001;       //the 1st one to create an account get this ID number

        private static string bank\_name = "ICBC";

        private long bank\_cardID;

        public string account\_password;

        private long total\_amount = 100000;       //initial account

        private string[] data = new string[5];

        private string[] keys =

        {

            "card ID","holder's name", "total sum", "latest withdraw","latest deposit"

        };

        //property

        public long latest\_withdraw { set; get; }

        public long latest\_deposit { set; get; }

        public string date\_withdraw { set; get; }

        public string date\_deposit { set; get; }

        public string date\_create { set; get; }

        //indexer

        public string this[int i]

        {

            set

            {

                data[i] = value;

            }

            get

            {

                if (i >= 0 && i < data.Length)

                    return data[i];

                return null;

            }

        }

        public string this[string key]

        {

            get

            {

                return this[FindIndex(key)];

            }

        }

        private int FindIndex(string key)

        {

            for (int i = 0; i < keys.Length; i++)

                if (keys[i] == key)

                    return i;

            return -1;

        }

        //methods

        //withdraw from the account, record the current time

        public void withdrawMoney()

        {

            Console.Write("amount(withdraw): ");

            latest\_withdraw = Convert.ToInt32(Console.ReadLine());

            if (latest\_withdraw <= total\_amount)

            {

                total\_amount -= latest\_withdraw;

                this[2] = Convert.ToString(total\_amount);

                date\_withdraw = DateTime.Now.ToString();

                this[3] = Convert.ToString(latest\_withdraw);

            }

            else

                Console.WriteLine("Lack of balance. Operation is refused\n");

        }

        //deposit from the account, record the current time

        public void depositMoney()

        {

            Console.Write("amount(deposit): ");

            latest\_deposit = Convert.ToInt32(Console.ReadLine());

            if (latest\_deposit > 0)

            {

                total\_amount += latest\_deposit;

                this[2] = Convert.ToString(total\_amount);

                date\_deposit = DateTime.Now.ToString();

                this[4] = Convert.ToString(latest\_deposit);

            }

            else

                Console.WriteLine("Invalid operation\n");

        }

        //get information about the account

        void get\_card\_info()              //try 4 choices below

        {

            Console.WriteLine("( card ID / holder's name / total sum / latest withdraw / latest deposit )?");

            string instr = Console.ReadLine();

            if (instr == "card ID" || instr == "holder's name" || instr == "total sum" || instr == "latest withdraw"

                || instr == "latest deposit")

            {

                this[3] = Convert.ToString(latest\_withdraw);

                this[2] = Convert.ToString(total\_amount);

                Console.Write(instr + " is " + this[instr]);

                if (instr == "latest withdraw")

                    Console.WriteLine("         " + date\_withdraw);

                else if (instr == "latest deposit")

                    Console.WriteLine("         " + date\_deposit);

                else if (instr == "card ID")

                    Console.WriteLine("         " + date\_create);

                else if (instr == "card ID" || instr == "total sum")

                    Console.WriteLine("\n");

            }

            else

                Console.WriteLine("Invalid input!!");

        }

        //Inheritance, subclass CreditAccount

        protected class CreditAccount : Account

        {

            //Constructor

            CreditAccount(long bank\_cardID, string password)

            {

                this.bank\_cardID = bank\_cardID;

                this.account\_password = password;

            }

            //new field

            private long line\_of\_credit;        //line of credit

            //new property

            public string credit\_rating { set; get; }

            //new method

            public long get\_line\_of\_credit()        //line of credit according to the credit rating

            {

                if (credit\_rating == "3" || credit\_rating == "2")

                    line\_of\_credit = 50000;

                else if (credit\_rating == "1" || credit\_rating == "0")

                    line\_of\_credit = 10000;

                else

                    line\_of\_credit = 0;

                return line\_of\_credit;

            }

            //override method withdrawMoney()

            new public void withdrawMoney()

            {

                Console.Write("amount(withdraw): ");

                latest\_withdraw = Convert.ToInt32(Console.ReadLine());

                if (latest\_withdraw <= total\_amount + line\_of\_credit)

                {

                    total\_amount -= latest\_withdraw;

                    this[2] = Convert.ToString(total\_amount);

                    date\_withdraw = DateTime.Now.ToString();

                    this[3] = Convert.ToString(latest\_withdraw);

                    if (latest\_withdraw >= total\_amount)

                    {

                        Console.WriteLine("warning: you're using your credit!!   Withdraw successfully");

                        int temp = Convert.ToInt32(credit\_rating);

                        credit\_rating = Convert.ToString(--temp);

                        get\_line\_of\_credit();

                    }

                }

                else

                {

                    Console.WriteLine("Lack of balance. Operation is refused\n");

                }

            }

            public static void Main(String[] args)

            {

                Account a;

                CreditAccount ca;

                string card\_category;

                //create a new account, set password, get an ID number

                void create\_account()

                {

                    Console.WriteLine("#########  " + bank\_name + "  #########");      //which bank

                    Console.Write("create an account ( normal / credit )?");

                    card\_category = Console.ReadLine();

                    if (card\_category != "credit" && card\_category != "normal")

                    {

                        Console.WriteLine("Invalid input");

                        create\_account();

                    }

                    Console.Write("set password:  ");

                    string password = Console.ReadLine();                                      //set password

                    Account a\_create = new CreditAccount(initial\_ID, password);

                    a = a\_create;

                    ca = (CreditAccount)a;

                    a[0] = Convert.ToString(initial\_ID);                                 //save ID

                    Console.Write("Your name:  ");

                    a[1] = Console.ReadLine();                                      //save owner's name

                    a[2] = Convert.ToString(a.total\_amount);

                    a.date\_create = DateTime.Now.ToString();          //save the time that this account was created

                    Console.WriteLine("create successfully!!\nYour ID: " + initial\_ID + "    " +

                        "Remember your password:" + password + "    You have $100000 initially.");

                    initial\_ID++;

                    a.latest\_deposit = 0;

                    a.latest\_withdraw = 0;

                    if (card\_category == "credit")

                    {

                        ca.credit\_rating = "3";

                        ca.get\_line\_of\_credit();

                    }

                }

                create\_account();

                while (true)

                {

                    if (card\_category == "normal")

                    {

                        //ask for the next instruction from the user

                        Console.WriteLine("( create again / get information / withdraw / deposit )?");

                        switch (Console.ReadLine())

                        {

                            case "create again": create\_account(); break;

                            case "get information":

                                a.get\_card\_info(); break;

                            case "withdraw":

                                a.withdrawMoney();

                                a[2] = Convert.ToString(a.latest\_withdraw);

                                break;

                            case "deposit":

                                a.depositMoney();

                                a[3] = Convert.ToString(a.latest\_deposit);

                                break;

                            default:

                                Console.WriteLine("invalid input\n");

                                break;

                        }

                    }

                    else if (card\_category == "credit")

                    {

                        //ask for the next instruction from the user

                        Console.WriteLine("( create again / get information / withdraw / deposit / line of credit )?");

                        switch (Console.ReadLine())

                        {

                            case "create again": create\_account(); break;

                            case "get information":

                                ca.get\_card\_info(); break;

                            case "withdraw":

                                ca.withdrawMoney();

                                ca[2] = Convert.ToString(ca.latest\_withdraw);

                                break;

                            case "deposit":

                                ca.depositMoney();

                                ca[3] = Convert.ToString(ca.latest\_deposit);

                                break;

                            case "line of credit":

                                Console.WriteLine("LIne of credit:  " + ca.get\_line\_of\_credit());

                                break;

                            default:

                                Console.WriteLine("invalid input\n");

                                break;

                        }

                    }

                }

            }

        }

    }

}