

Module 4 函数

标量函数---与内置函数类似

多语句表值函数---内容象存储过程，象视图一样引用

嵌入式表值函数---与带参数的视图类似，作为单条 Select 语句的结果返回一个表

数据库中可用的函数



系统内置的函数

```
select rand() --取得随机数
select getdate() --取得当前时间
5 天后是几号?
select dateadd(day,5,getdate())
```

使用聚集函数

输入众多数值，输出一个结果。比如计算平均分、最高分，总分。

统计网络班和开发班数据结构平均分

```
select 班级,avg(数据结构) 平均分 from dbo.vss group by 班级
```

统计网络班和开发班数据结构最高分

```
select 班级,max(数据结构) 最高分 from dbo.vss group by 班级
```

统计网络班和开发班总分最高分

```
select 班级,max(数据结构+计算机网络+大学英语+操作系统) 总分 from dbo.vss  
group by 班级
```

找出各班总分最高的学生，用到临时表，不用了删除

```
select 班级,max(数据结构+计算机网络+大学英语+操作系统) 总分 into #table1  
from dbo.vss group by 班级  
select * from vss where (数据结构+计算机网络+大学英语+操作系统) in (select  
总分 from #table1)  
drop table #table1
```

创建自定义函数显示优秀 良好 一般

创建函数 总分在200分以上的显示为优秀

总分在150在199之间的显示为良好

总分在100-149之间的显示为一般

```
create function showScore  
(@Score int)  
returns nvarchar(30)  
as  
begin  
if @Score>=200 return '优秀'  
if @Score>=150 and @score<=199 return '良好'  
return '一般'  
end
```

验证函数是否正确

```
select dbo.showScore(220)
```

在select语句中使用函数更改显示结果

```
select 姓名,dbo.showScore(数据结构+计算机网络+大学英语+操作系统) 综合成绩  
from vss  
order by 综合成绩
```

以下函数能够将数字转化成大写，财务经常用到的函数

```
CREATE FUNCTION fun_cgnum
(@num INT)
RETURNS VARCHAR(100)
AS
BEGIN
    DECLARE @temp INT, @res INT, @i TINYINT
    DECLARE @str VARCHAR(100), @no VARCHAR(20), @unit VARCHAR(16)
    SELECT @str='', @no='另壹贰叁肆伍陆柒捌玖', @unit='拾佰仟万拾佰仟亿'
    SET @temp=@num
    SELECT @i=0, @res=@temp%10, @temp=@temp/10
    WHILE @temp>0
    BEGIN
        IF @i=0
            SET @str=SUBSTRING(@no, @res+1, 1)
        ELSE
            SET @str=SUBSTRING(@no, @res+1, 1)+SUBSTRING(@unit, @i, 1)+@str
        SELECT @res=@temp%10, @temp=@temp/10
        SET @i=@i+1
    END
    SET @str=SUBSTRING(@no, @res+1, 1)+SUBSTRING(@unit, @i, 1)+@str
    SET @str=REPLACE(@str, '另拾', '另')
    SET @str=REPLACE(@str, '另佰', '另')
    SET @str=REPLACE(@str, '另仟', '另')
    SET @str=REPLACE(@str, '另拾', '另')
    SET @str=REPLACE(@str, '另万', '万')
    WHILE @i>0
    BEGIN
        SET @str=REPLACE(@str, '另另', '另')
        SET @i=CHARINDEX('另另', @str)
    END
    SET @str=REPLACE(@str, '另万', '万')
    SET @str=REPLACE(@str, '亿万', '亿')
    IF RIGHT(@str, 1)='另'
    SET @str=LEFT(@str, LEN(@str)-1)
    RETURN @str
END
GO
```

使用函数显示学生总分

```
select 姓名,班级,dbo.fun_cgnum(总分) 总分大写 from dbo.VSumMark
```

以下函数能够将汉字转化成拼音

```
Create function [dbo].[fn_GetPinyin](@words nvarchar(2000))
returns varchar(8000)
as
begin
declare @word nchar(1)
declare @pinyin varchar(8000)
declare @i int
declare @words_len int
declare @unicode int
set @i = 1
set @words = ltrim(rtrim(@words))
set @words_len = len(@words)
while (@i <= @words_len) --循环取字符
begin
set @word = substring(@words, @i, 1)
set @unicode = unicode(@word)
set @pinyin = ISNULL(@pinyin+space(0),'')+
(case when unicode(@word) between 19968 and 19968+20901 then
(select top 1 py from (
select 'a' as py,N'厶' as word
union all select 'ai',N'爰'
union all select 'an',N'黯'
union all select 'ang',N'醯'
union all select 'ao',N'鶩'
union all select 'ba',N'杷'
union all select 'bai',N'𪔐' --鞞𪔐𪔐
union all select 'ban',N'辦'
union all select 'bang',N'鎗'
union all select 'bao',N'鏹'
union all select 'bei',N'璧'
union all select 'ben',N'輻'
union all select 'beng',N'鏞'
union all select 'bi',N'鼃'
union all select 'bian',N'變'
union all select 'biao',N'鰲'
union all select 'bie',N'弊'
```

union all select 'bin',N'鬢'
union all select 'bing',N'靄'
union all select 'bo',N'蔔'
union all select 'bu',N'簿'
union all select 'ca',N'噉'
union all select 'cai',N'恣'--縹恣
union all select 'can',N'爇'
union all select 'cang',N'贍'
union all select 'cao',N'蟄'
union all select 'ce',N'箝'
union all select 'cen',N'岑'
union all select 'ceng',N'耄'--砵砵岵猋耄
union all select 'cha',N'詫'
union all select 'chai',N'囁'
union all select 'chan',N'顫'
union all select 'chang',N'輶'
union all select 'chao',N'舛'
union all select 'che',N'爇'
union all select 'chen',N'識'
union all select 'cheng',N'秤'
union all select 'chi',N'鷺'
union all select 'chong',N'銃'
union all select 'chou',N'殍'
union all select 'chu',N'薑'
union all select 'chuai',N'踹'
union all select 'chuan',N'鷄'
union all select 'chuang',N'愴'
union all select 'chui',N'頤'
union all select 'chun',N'蠢'
union all select 'chuo',N'絳'
union all select 'ci',N'髡'--賜髡
union all select 'cong',N'諗'
union all select 'cou',N'輶'
union all select 'cu',N'顚'
union all select 'cuan',N'爨'
union all select 'cui',N'睪'
union all select 'cun',N'村'
union all select 'cuo',N'錯'
union all select 'da',N'撻'
union all select 'dai',N'隸'
union all select 'dan',N'餐'
union all select 'dang',N'闇'
union all select 'dao',N'蠹'
union all select 'de',N'的'

union all select 'den',N'鈍'
union all select 'deng',N'鐙'
union all select 'di',N'蠅'
union all select 'dia',N'嗲'
union all select 'dian',N'驢'
union all select 'diao',N'鐮'
union all select 'die',N'黠' --咍黠
union all select 'ding',N'顛'
union all select 'diu',N'鈰'
union all select 'dong',N'霏'
union all select 'dou',N'鬪'
union all select 'du',N'蠹'
union all select 'duan',N'𪔐' --𪔐𪔐
union all select 'dui',N'對'
union all select 'dun',N'踰'
union all select 'duo',N'鴉'
union all select 'e',N'鰓'
union all select 'en',N'摠'
union all select 'eng',N'鞞'
union all select 'er',N'榭'
union all select 'fa',N'髮'
union all select 'fan',N'繁'
union all select 'fang',N'放'
union all select 'fei',N'贐'
union all select 'fen',N'鱻'
union all select 'feng',N'勳'
union all select 'fo',N'拂'
union all select 'fou',N'馮'
union all select 'fu',N'癩' --鰻癩
union all select 'ga',N'尪'
union all select 'gai',N'璫'
union all select 'gan',N'瀨'
union all select 'gang',N'戇'
union all select 'gao',N'鎔'
union all select 'ge',N'藹'
union all select 'gei',N'給'
union all select 'gen',N'揸'
union all select 'geng',N'塏' --互塏𪔐𪔐
union all select 'gong',N'𪔐' --煩𪔐𪔐
union all select 'gou',N'購'
union all select 'gu',N'顧'
union all select 'gua',N'詿'
union all select 'guai',N'恠'
union all select 'guan',N'鱸'

union all select 'guang',N'橫'
union all select 'gui',N'鯪'
union all select 'gun',N'鎔'
union all select 'guo',N'腠'
union all select 'ha',N'哈'
union all select 'hai',N'饁'
union all select 'han',N'鶡'
union all select 'hang',N'沆'
union all select 'hao',N'尅'
union all select 'he',N'霸'
union all select 'hei',N'嬾'
union all select 'hen',N'恨'
union all select 'heng',N'堊' --堊囍
union all select 'hong',N'閔'
union all select 'hou',N'鸛'
union all select 'hu',N'鵠'
union all select 'hua',N'薤'
union all select 'huai',N'瓊'
union all select 'huan',N'鰓'
union all select 'huang',N'鐓'
union all select 'hui',N'顙'
union all select 'hun',N'譚'
union all select 'huo',N'谷'
union all select 'ji',N'驥'
union all select 'jia',N'𨋖'
union all select 'jian',N'鑣'
union all select 'jiang',N'瞿'
union all select 'jiao',N'醕'
union all select 'jie',N'躑'
union all select 'jin',N'𨾏'
union all select 'jing',N'競'
union all select 'jiong',N'藟'
union all select 'jiu',N'檣'
union all select 'ju',N'燿'
union all select 'juan',N'絹'
union all select 'jue',N'鑊'
union all select 'jun',N'攢'
union all select 'ka',N'鈇'
union all select 'kai',N'𡵓' --鍬𡵓
union all select 'kan',N'闌'
union all select 'kang',N'閔'
union all select 'kao',N'鮐'
union all select 'ke',N'騾'
union all select 'ken',N'褱'

union all select 'keng',N'鏗' --弓曷堯尔忒

union all select 'kong',N'龔'

union all select 'kou',N'馱'

union all select 'ku',N'瞿'

union all select 'kua',N'誇'

union all select 'kuai',N'鯁'

union all select 'kuan',N'窾'

union all select 'kuang',N'鑛'

union all select 'kui',N'鑹'

union all select 'kun',N'睏'

union all select 'kuo',N'鵠'

union all select 'la',N'鞞'

union all select 'lai',N'籟'

union all select 'lan',N'欄'

union all select 'lang',N'呤'

union all select 'lao',N'勞'

union all select 'le',N'餂'

union all select 'lei',N'厓' --嘍厓

union all select 'leng',N'陵'

union all select 'li',N'璿'

union all select 'lia',N'倆'

union all select 'lian',N'戀'

union all select 'liang',N'鋸'

union all select 'liao',N'瞭'

union all select 'lie',N'鱣'

union all select 'lin',N'轡' --轡拎

union all select 'ling',N'伶'

union all select 'liu',N'咯' --礪礪嚙咯

union all select 'long',N'隴'

union all select 'lou',N'鏤'

union all select 'lu',N'魯'

union all select 'lv',N'鑢'

union all select 'luan',N'亂'

union all select 'lue',N'撾'

union all select 'lun',N'論'

union all select 'luo',N'鑠'

union all select 'ma',N'嘛'

union all select 'mai',N'霰'

union all select 'man',N'蔓'

union all select 'mang',N'蟒'

union all select 'mao',N'耖'

union all select 'me',N'瘻' --瘻攸

union all select 'mei',N'墨'

union all select 'men',N'們'

union all select 'meng',N'蒙' --霧跽
union all select 'mi',N'冪'
union all select 'mian',N'麵'
union all select 'miao',N'廟'
union all select 'mie',N'饊' --饊𩚑
union all select 'min',N'簠'
union all select 'ming',N'詔'
union all select 'miu',N'謬'
union all select 'mo',N'𪔐' --𪔐𪔑
union all select 'mou',N'𪔒' --𪔒𪔓
union all select 'mu',N'旂'
union all select 'na',N'𪔔'
union all select 'nai',N'銖'
union all select 'nan',N'孀'
union all select 'nang',N'𪔕'
union all select 'nao',N'𪔖'
union all select 'ne',N'呢'
union all select 'nei',N'𪔗' --嫩𪔗
union all select 'nen',N'嫩'
union all select 'neng',N'能' --𪔘𪔙𪔚𪔛
union all select 'ni',N'孃'
union all select 'nian',N'𪔜'
union all select 'niang',N'釀'
union all select 'niao',N'豚'
union all select 'nie',N'𪔝'
union all select 'nin',N'𪔞'
union all select 'ning',N'𪔟'
union all select 'niu',N'𪔠'
union all select 'nong',N'𪔡'
union all select 'nou',N'𪔢'
union all select 'nu',N'𪔣'
union all select 'nv',N'𪔤'
union all select 'nue',N'𪔥'
union all select 'nuan',N'𪔦' --𪔦𪔧𪔨
union all select 'nuo',N'𪔩'
union all select 'o',N'𪔪' --𪔪𪔫𪔬
union all select 'ou',N'𪔭'
union all select 'pa',N'𪔮'
union all select 'pai',N'𪔯' --𪔯𪔰
union all select 'pan',N'𪔱'
union all select 'pang',N'𪔲'
union all select 'pao',N'𪔳'
union all select 'pei',N'𪔴'
union all select 'pen',N'𪔵'

union all select 'peng',N'聵' --泚聵闖聵聵

union all select 'pi',N'鸛'

union all select 'pian',N'騙'

union all select 'piao',N'標'

union all select 'pie',N'嫖'

union all select 'pin',N'聘'

union all select 'ping',N'蘋'

union all select 'po',N'魄'

union all select 'pou',N'劈' --岔劈

union all select 'pu',N'曝'

union all select 'qi',N'壑'

union all select 'qia',N'骼'

union all select 'qian',N'繹'

union all select 'qiang',N'𪔐' --𪔐𪔐𪔐

union all select 'qiao',N'蹶'

union all select 'qie',N'撿'

union all select 'qin',N'蕝'

union all select 'qing',N'櫟'

union all select 'qiong',N'璫'

union all select 'qiu',N'糗'

union all select 'qu',N'覷'

union all select 'quan',N'勸'

union all select 'que',N'確'

union all select 'qun',N'囀'

union all select 'ran',N'燃'

union all select 'rang',N'讓'

union all select 'rao',N'繞'

union all select 're',N'熱'

union all select 'ren',N'飪'

union all select 'reng',N'陝'

union all select 'ri',N'駟'

union all select 'rong',N'裕'

union all select 'rou',N'嶠'

union all select 'ru',N'搗'

union all select 'ruan',N'礪'

union all select 'rui',N'𪔐'

union all select 'run',N'櫛' --櫛掇

union all select 'ruo',N'鶻'

union all select 'sa',N'柁' --檣柁

union all select 'sai',N'蠶' --簞蠶

union all select 'san',N'閭'

union all select 'sang',N'喪'

union all select 'sao',N'𪔐'

union all select 'se',N'颺' --裊聳

union all select 'sen',N'簪'
union all select 'seng',N'綰' --閩綰
union all select 'sha',N'霎'
union all select 'shai',N'曬'
union all select 'shan',N'鱔'
union all select 'shang',N'綳'
union all select 'shao',N'梢'
union all select 'she',N'榑'
union all select 'shen',N'疹'
union all select 'sheng',N'賸'
union all select 'shi',N'砒' --鯉魮尅砒
union all select 'shou',N'嗽'
union all select 'shu',N'黠'
union all select 'shua',N'諉'
union all select 'shuai',N'擥'
union all select 'shuan',N'膾'
union all select 'shuang',N'瀟'
union all select 'shui',N'睡'
union all select 'shun',N'髻'
union all select 'shuo',N'鑠'
union all select 'si',N'𪔐' --湯螻𪔐
union all select 'song',N'鋹'
union all select 'sou',N'瘰'
union all select 'su',N'鷗'
union all select 'suan',N'算'
union all select 'sui',N'鎚'
union all select 'sun',N'潁'
union all select 'suo',N'蟀'
union all select 'ta',N'𨔵' --躡𨔵
union all select 'tai',N'燐'
union all select 'tan',N'𦉳'
union all select 'tang',N'燙'
union all select 'tao',N'𪔐' --討𪔐
union all select 'te',N'螻'
union all select 'teng',N'𪔐' --靈𪔐
union all select 'ti',N'趯'
union all select 'tian',N'澹'
union all select 'tiao',N'糴'
union all select 'tie',N'饗'
union all select 'ting',N'𪔐' --鼎𪔐
union all select 'tong',N'勲'
union all select 'tou',N'透'
union all select 'tu',N'鵠'
union all select 'tuan',N'祿'

union all select 'tui',N'駢'
union all select 'tun',N'垆'
union all select 'tuo',N'籜'
union all select 'wa',N'韃'
union all select 'wai',N'類'
union all select 'wan',N'購'
union all select 'wang',N'塋'
union all select 'wei',N'韋'
union all select 'wen',N'璽'
union all select 'weng',N'魑'
union all select 'wo',N'齧'
union all select 'wu',N'鵠'
union all select 'xi',N'霽'
union all select 'xia',N'鏹'
union all select 'xian',N'黥'
union all select 'xiang',N'鯨'
union all select 'xiao',N'敦'
union all select 'xie',N'蹊'
union all select 'xin',N'釁'
union all select 'xing',N'晷'
union all select 'xiong',N'簋'
union all select 'xiu',N'鰕'
union all select 'xu',N'蓀'
union all select 'xuan',N'贊'
union all select 'xue',N'濁'
union all select 'xun',N'鏹'
union all select 'ya',N'齧'
union all select 'yan',N'灇'
union all select 'yang',N'樣'
union all select 'yao',N'鑰'
union all select 'ye',N'坼'--鵝臍坼
union all select 'yi',N'齧'
union all select 'yin',N'穩'
union all select 'ying',N'膺'
union all select 'yo',N'啣'
union all select 'yong',N'營'
union all select 'you',N'黝'
union all select 'yu',N'燿'
union all select 'yuan',N'願'
union all select 'yue',N'鷓'
union all select 'yun',N'韻'
union all select 'za',N'齏'
union all select 'zai',N'絳'
union all select 'zan',N'饕'

```

union all select 'zang',N'臟'
union all select 'zao',N'竈'
union all select 'ze',N'稜'
union all select 'zei',N'鍼'
union all select 'zen',N'贈'
union all select 'zeng',N'贈'
union all select 'zha',N'醺'
union all select 'zhai',N'瘵'
union all select 'zhan',N'驂'
union all select 'zhang',N'暉'
union all select 'zhao',N'繹'
union all select 'zhe',N'鷗'
union all select 'zhen',N'黠'
union all select 'zheng',N'證'
union all select 'zhi',N'黠'
union all select 'zhong',N'諄'
union all select 'zhou',N'驟'
union all select 'zhu',N'鑄'
union all select 'zhua',N'爪'
union all select 'zhuai',N'踐'
union all select 'zhuan',N'簍'
union all select 'zhuang',N'憊'
union all select 'zhui',N'鑊'
union all select 'zhun',N'稭'
union all select 'zhuo',N'籬'
union all select 'zi',N'漬'--漬嘔
union all select 'zong',N'縱'
union all select 'zou',N'嬭'
union all select 'zu',N'諳'
union all select 'zuan',N'攢'
union all select 'zui',N'檣'
union all select 'zun',N'鎔'
union all select 'zuo',N'左') t
where word >= @word collate Chinese_PRC_CS_AS_KS_WS
order by word ASC) else @word end)
set @i = @i + 1
end
return @pinyin
END

```

使用以上函数给学生插入邮箱 电子邮件地址为 学生姓名全拼@edu2act.org

测试函数是否正常

```
select dbo.fn_GetPinyin('韩立刚')
```

给用户添加电子邮箱

```
update dbo.TStudent set Email=dbo.fn_GetPinyin(Sname)+'@onest.net'
```

可以看到函数的功能，能够帮我们解决非常实际的问题。我们可以从网上查找实现某些功能的函数。

思考题

使用随机函数随机抽取TStudent表的一条记录

以下命令先确定表中有多少条记录

```
declare @SD int
```

```
set @SD=convert(int,rand()*(select count(*) from dbo.TStudent))
```

取得@SD数据数

查找第@SD条记录

```
exec('select top 1 * from dbo.TStudent where StudentID not in (select  
top '+ @SD+ ' StudentID from dbo.TStudent)')
```