第二次课

1、矩阵的拼接

注：**绿色** 为 MATLAB 代码，**蓝色** 为运行结果

```
a11=eye(2)
```

```
a11 =
     1     0
     0     1
```

```
a12=zeros(2,3)
```

```
a12 =
     0     0     0
     0     0     0
```

```
a21=zeros(3,2)
```

```
a21 =
     0     0
     0     0
     0     0
```

```
a22=magic(3)
```

```
a22 =
     8     1     6
     3     5     7
     4     9     2
```

```
a=[a11, a12; a21, a22]
```

```
a =
     1     0     0     0     0
     0     1     0     0     0
     0     0     8     1     6
     0     0     3     5     7
     0     0     4     9     2
```

2、字符串的创建与访问

```
a='zhangsan'
```

```
a =
zhangsan
```

```
whos a
```

```
  Name      Size            Bytes  Class    Attributes

  a         1x8                16  char
```

```
a(5)
```

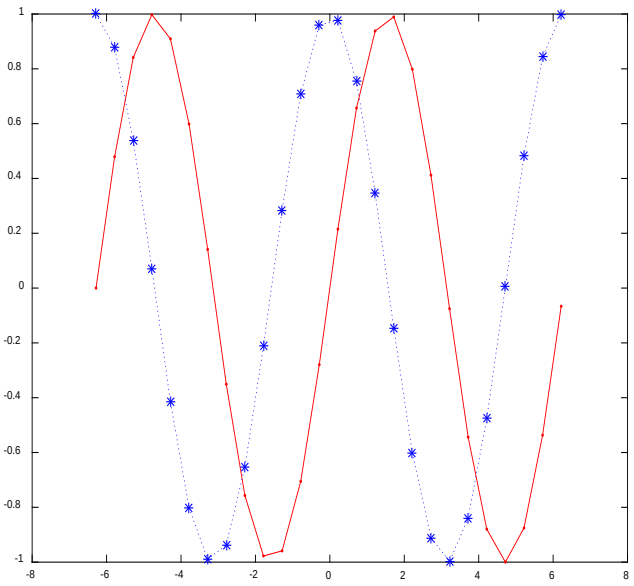
```
ans =
g

a(2:2:5)

ans =
hn

whos ans
  Name      Size            Bytes  Class    Attributes

  ans       1x2                 4  char

b='lisi'

b =
lisi

whos a b
  Name      Size            Bytes  Class    Attributes

  a         1x8                16  char
  b         1x4                 8  char

c='lisi    '

c =
lisi

whos b c
  Name      Size            Bytes  Class    Attributes

  b         1x4                 8  char
  c         1x8                16  char

s1=[a b]

s1 =
zhangsanlisi

s2=[a;c]

s2 =
zhangsan
lisi

whos s1 s2
  Name      Size            Bytes  Class    Attributes

  s1        1x12               24  char
  s2        2x8                32  char
```

```
s2(2,:)

ans =
lisi

s2(:,3)

ans =
a
s
```

(2)一元、二元函数绘图

plot()
mesh()
做法：抽点，连线

```
% 在[-2π,2π]区域绘制 y=sin(x), y=cos(x)图形
% 方法 1
x=-2*pi:0.5:2*pi;
y1=sin(x);
y2=cos(x);
plot(x,y1,'r.-',x,y2,'b*:')
```




```
% 方法 2
x=-2*pi:.5:2*pi;
y1=sin(x);
plot(x,y1,'r.-')
y2=cos(x);
hold on
plot(x,y2,'b*:')
hold off
```

如何在[-2π,2π]×[-π,π]绘制 z=xy 的图形?

分析:

[X,Y]=meshgrid(-2*pi:0.9:2*pi,-pi:0.5:pi)

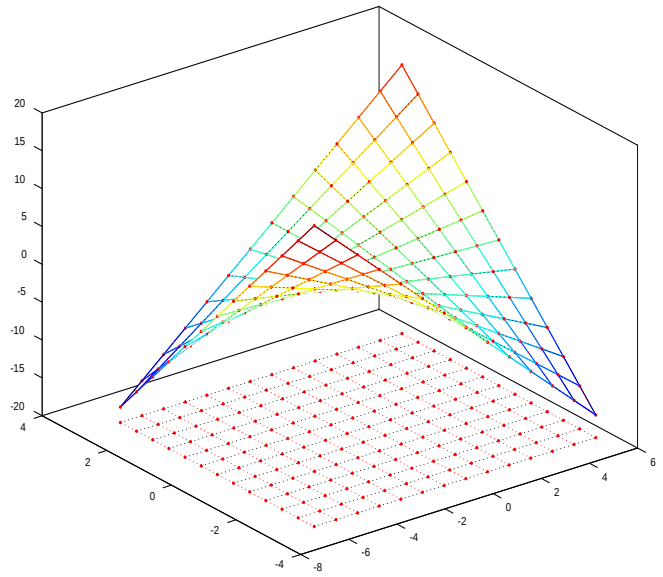
这里 X,Y 为同型矩阵，存储的是绘图区域中抽样点的坐标，即下图 xoy 平面中红色的点。

Z=X.*Y

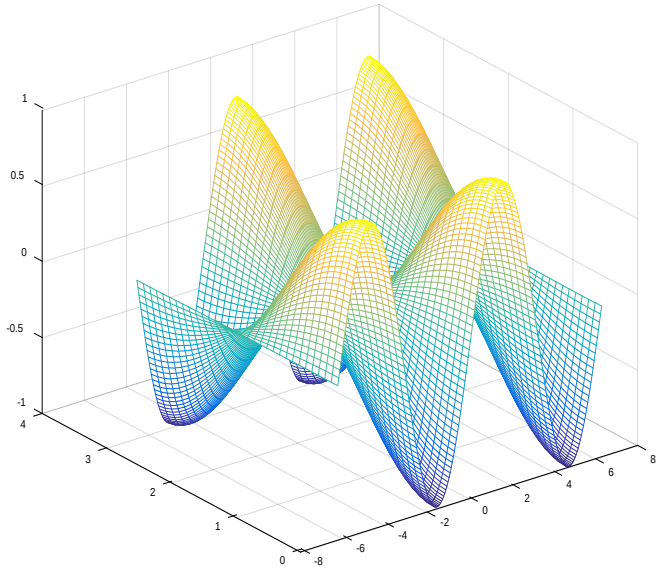
这里 Z 为抽样点处的函数值，与 X,Y 同型。注意点运算。

mesh(X,Y,Z)

绘制二元函数图形,X,Y,Z 为抽样点的坐标,即下图曲面上红色的点。




```
% 在[-2π,2π]×[0,π]绘制二元函数图形 z=sin(x)cos(y);

% 方法 1
x=-2*pi:.05:2*pi;
y=0:0.1:pi;
[X,Y]=meshgrid(x,y);
Z=sin(X).*cos(Y);
mesh(X,Y,Z)
```




```
% 方法 2

x=-2*pi:.05:2*pi;
y=0:0.1:pi;
%返回 x,y 的列数
xt=size(x,2);  %或者 xt=length(x)
yt=size(y,2);

X=ones(yt,1)*x;
Y=y'*ones(1,xt);

Z=cos(y)'*sin(x);
mesh(X,Y,Z)
```