1、标量变量

```
a = 10
```

```
a = 10
```

```
b = 2.5*10^23
```

```
b = 2.5000e+23
```

```
c = 2+3*i
```

```
c = 2.0000 + 3.0000i
```

```
d = exp(i*2*pi/3)
```

```
d = -0.5000 + 0.8660i
```

2、向量变量

```
aVec = [3.14 15 9 26]
```

```
aVec = 1×4
    3.1400   15.0000    9.0000   26.0000
```

```
bVec = [2.71;8;28;182]
```

```
bVec = 4×1
    2.7100
    8.0000
   28.0000
  182.0000
```

```
cVec = 5:-0.2:-5
```

```
cVec = 1×51
    5.0000    4.8000    4.6000    4.4000    4.2000    4.0000    3.8000    3.6000 ···
```

```
dVec = logspace(0,1,100)
```

```
dVec = 1×100
    1.0000    1.0235    1.0476    1.0723    1.0975    1.1233    1.1498    1.1768 ···
```

```
eVec = "Hello"
```

```
eVec =
"Hello"
```

3、矩阵变量

```
% aMat = 2*ones(9)
aMat = 2+zeros(9)
```

```
aMat = 9×9
     2     2     2     2     2     2     2     2     2
     2     2     2     2     2     2     2     2     2
     2     2     2     2     2     2     2     2     2
     2     2     2     2     2     2     2     2     2
```

```
     2     2     2     2     2     2     2     2     2
     2     2     2     2     2     2     2     2     2
     2     2     2     2     2     2     2     2     2
     2     2     2     2     2     2     2     2     2
     2     2     2     2     2     2     2     2     2
```

```
bMat = diag([1,2,3,4,5,4,3,2,1])
```

```
bMat = 9×9
     1     0     0     0     0     0     0     0     0
     0     2     0     0     0     0     0     0     0
     0     0     3     0     0     0     0     0     0
     0     0     0     4     0     0     0     0     0
     0     0     0     0     5     0     0     0     0
     0     0     0     0     0     4     0     0     0
     0     0     0     0     0     0     3     0     0
     0     0     0     0     0     0     0     2     0
     0     0     0     0     0     0     0     0     1
```

```
cMat = reshape([1:1:100],[10 10])
```

```
cMat = 10×10
     1    11    21    31    41    51    61    71    81    91
     2    12    22    32    42    52    62    72    82    92
     3    13    23    33    43    53    63    73    83    93
     4    14    24    34    44    54    64    74    84    94
     5    15    25    35    45    55    65    75    85    95
     6    16    26    36    46    56    66    76    86    96
     7    17    27    37    47    57    67    77    87    97
     8    18    28    38    48    58    68    78    88    98
     9    19    29    39    49    59    69    79    89    99
    10    20    30    40    50    60    70    80    90   100
```

```
dMat = nan(3,4)
```

```
dMat = 3×4
   NaN   NaN   NaN   NaN
   NaN   NaN   NaN   NaN
   NaN   NaN   NaN   NaN
```

```
eMat = [13 -1 5;-22 10 -87]
```

```
eMat = 2×3
    13    -1     5
   -22    10   -87
```

```
fMat1 = floor(-3+(3+3)*rand([5 3]))
```

```
fMat1 = 5×3
     0    -2     0
    -3     1     0
    -1    -2    -1
     2     2     1
    -1    -3     2
```

```
fMat2 = ceil(-3+(3+3)*rand([5 3]))
```

```
fMat2 = 5×3
     0    -1    -2
    -1     1    -2
    -1     2    -1
    -2     1     0
    -2     2     0
```

```
fMat3 = randi([-3 3],[5 3])
```

```
fMat3 = 5×3
    -1     2    -3
     3    -3    -1
    -1     1     0
    -1    -2    -3
    -2     3    -3
```

4、标量公式

```
x = 1/(1+exp(-(a-15)/6))
```

```
x = 0.3029
```

```
b = (sqrt(a)+nthroot(b,21))^pi
```

```
b = 6.2696e+03
```

```
z = log(real((c+d)*(c-d))*sin(a*pi/3)) / (c*conj(c))
```

```
z = 0.1046
```

5、矩阵公式

```
xMat = aVec*bVec*(aMat^2)
```

```
xMat = 9×9
10^5 ×
    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405 ···
    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405
    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405
    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405
    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405
    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405
    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405
    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405
    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405    1.8405
```

```
yMat = bVec*aVec
```

```
yMat = 4×4
10^3 ×
    0.0085    0.0406    0.0244    0.0705
    0.0251    0.1200    0.0720    0.2080
    0.0879    0.4200    0.2520    0.7280
    0.5715    2.7300    1.6380    4.7320
```

```
zMat = det(cMat)*(aMat*bMat)'
```

```
zMat = 9×9
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0
```

```
     0     0     0     0     0     0     0     0     0
```

6、常用功能和索引

```
cSum = sum(cMat)
```

```
cSum = 1×10
    55   155   255   355   455   555   655   755   855   955
```

```
eMean = mean(eMat,2)
```

```
eMean = 2×1
    5.6667
  -33.0000
```

```
eMat(1,:)=[1 1 1]
```

```
eMat = 2×3
     1     1     1
   -22    10   -87
```

```
cSub = cMat(2:9,2:9)
```

```
cSub = 8×8
    12    22    32    42    52    62    72    82
    13    23    33    43    53    63    73    83
    14    24    34    44    54    64    74    84
    15    25    35    45    55    65    75    85
    16    26    36    46    56    66    76    86
    17    27    37    47    57    67    77    87
    18    28    38    48    58    68    78    88
    19    29    39    49    59    69    79    89
```

```
% e题
lin = 1:1:20
```

```
lin = 1×20
     1     2     3     4     5     6     7     8     9    10    11    12    13 ···
```

```
k = find(mod(lin,2));
lin(k) = -1*lin(k);
lin = -1*lin
```

```
lin = 1×20
     1    -2     3    -4     5    -6     7    -8     9   -10    11   -12    13 ···
```

```
% f题
r = rand([1,5])
```

```
r = 1×5
    0.7934    0.1617    0.0827    0.8066    0.5477
```

```
k = find(r<0.5);
r(k)=0
```

```
r = 1×5
    0.7934         0         0    0.8066    0.5477
```