## 特殊矩阵

>> A=zeros(2,3)

A =

0 0 0

0 0 0

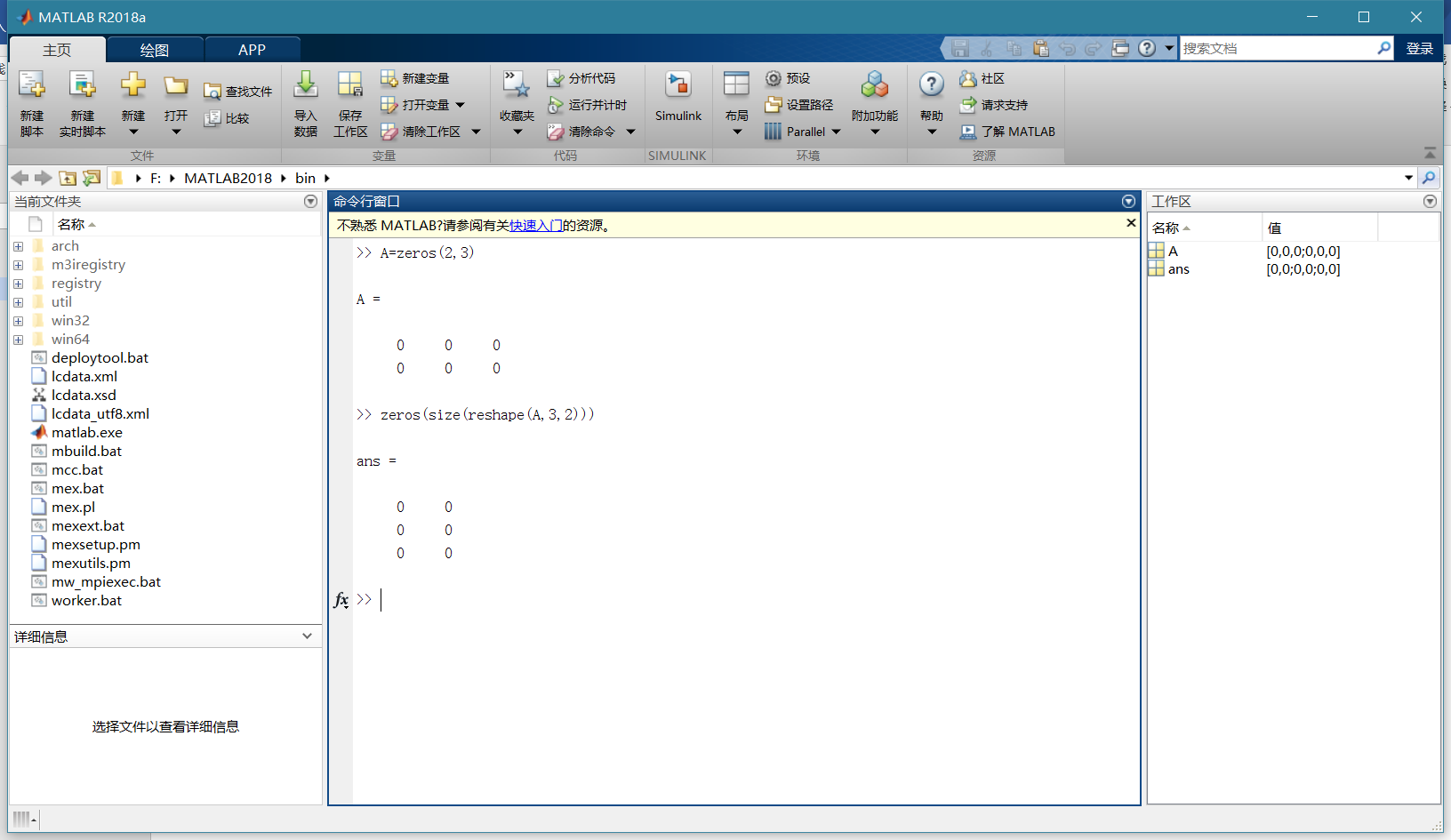
>> zeros(size(reshape(A,3,2)))

ans =

0 0

0 0

0 0



>> A=fix(10+(99-10+1)\*rand(5))

A =

78 73 84 49 54

76 12 72 44 50

45 34 38 78 68

68 14 95 81 73

25 18 13 26 77

>> B=0.6+sqrt(0.1)\*randn(5)

B =

0.3269 1.0847 0.2556 0.6272 0.4053

0.6245 0.3566 0.6103 0.1283 0.8366

0.2161 0.7174 0.7747 0.3653 0.5392

0.2479 0.5287 0.9480 0.2643 0.8810

0.5978 0.9533 1.0883 1.3433 0.3581

>> C=eye(5)

C =

1 0 0 0 0

0 1 0 0 0

0 0 1 0 0

0 0 0 1 0

0 0 0 0 1

>> (A+B)\*C==C\*A+B\*C

ans =

5×5 logical 数组

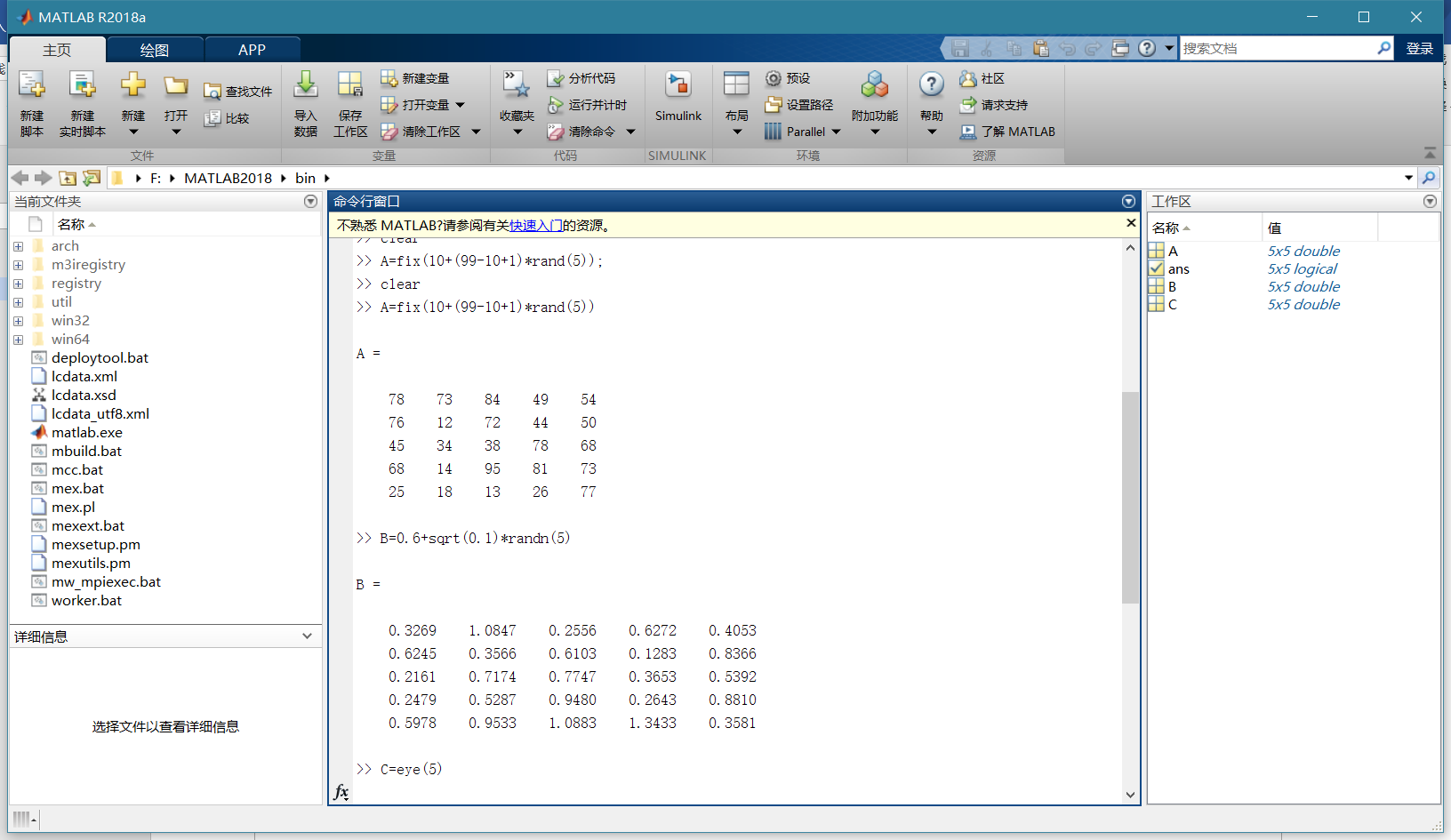
1 1 1 1 1

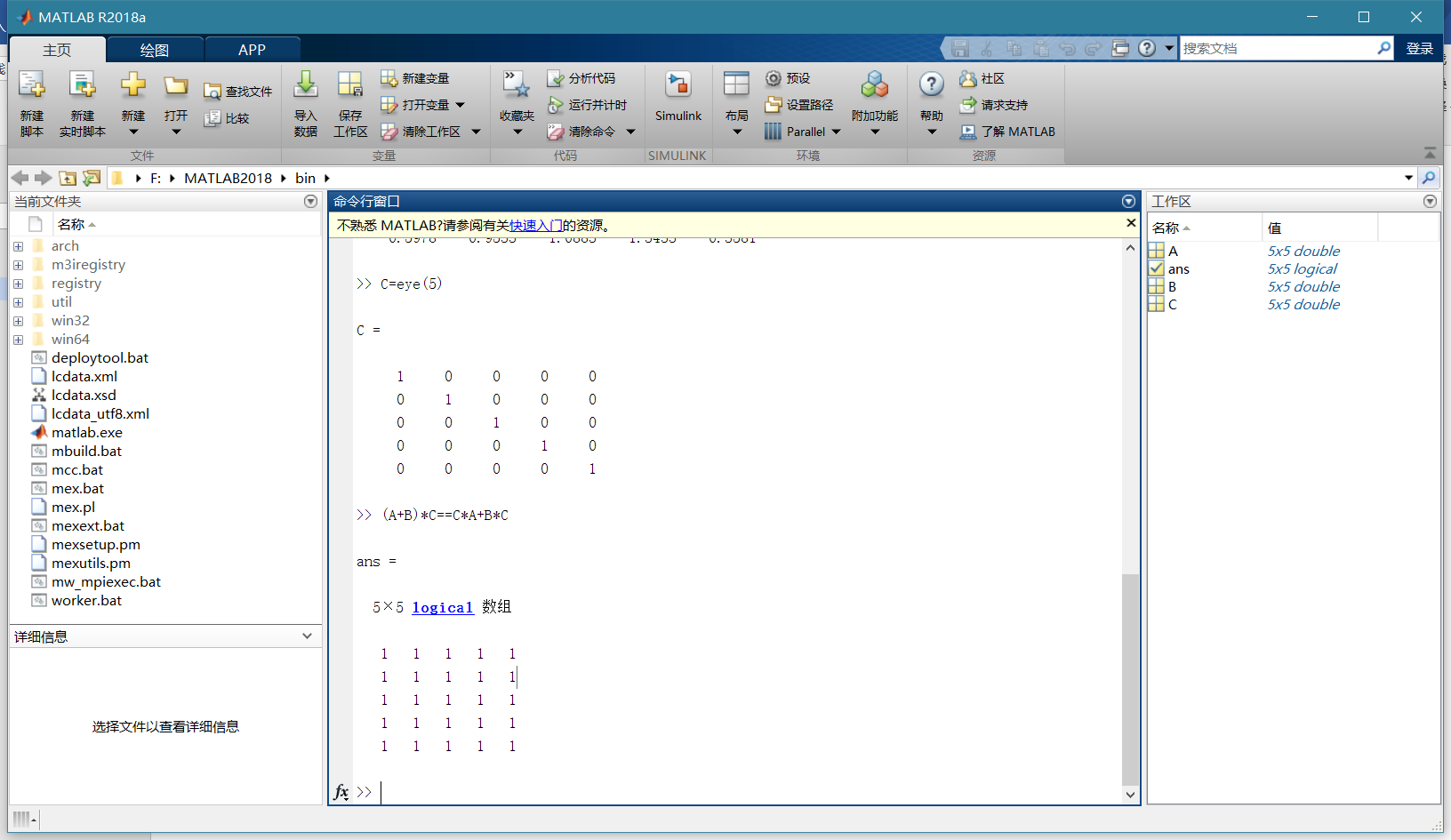
1 1 1 1 1

1 1 1 1 1

1 1 1 1 1

1 1 1 1 1





魔方矩阵

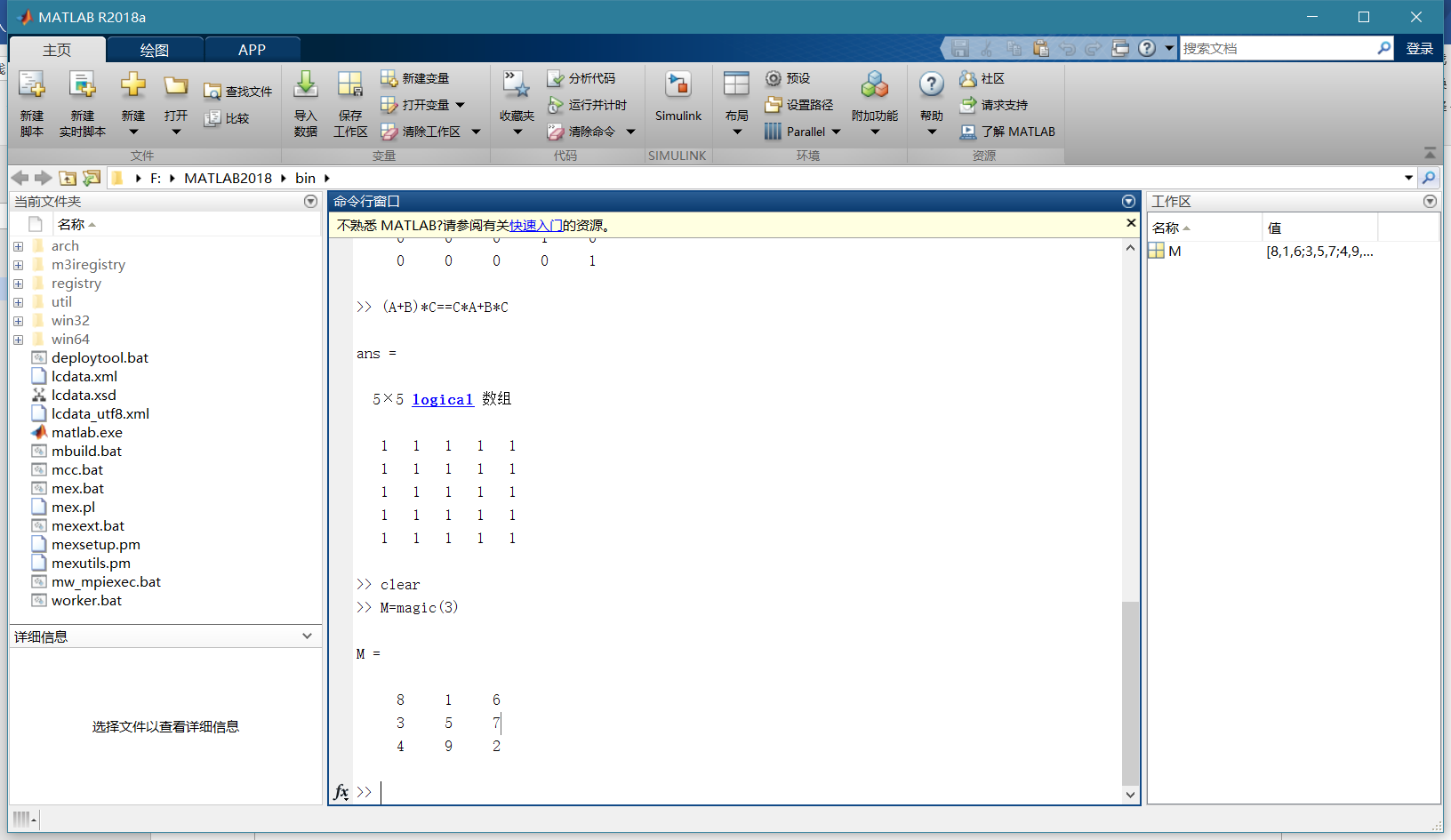
>> M=magic(3)

M =

8 1 6

3 5 7

4 9 2



>> M=magic(8)

M =

64 2 3 61 60 6 7 57

9 55 54 12 13 51 50 16

17 47 46 20 21 43 42 24

40 26 27 37 36 30 31 33

32 34 35 29 28 38 39 25

41 23 22 44 45 19 18 48

49 15 14 52 53 11 10 56

8 58 59 5 4 62 63 1

>> sum(M(1,:))

ans =

260

>> sum(M(:,1))

ans =

260



范德蒙矩阵：

>> A=vander(1:5)

A =

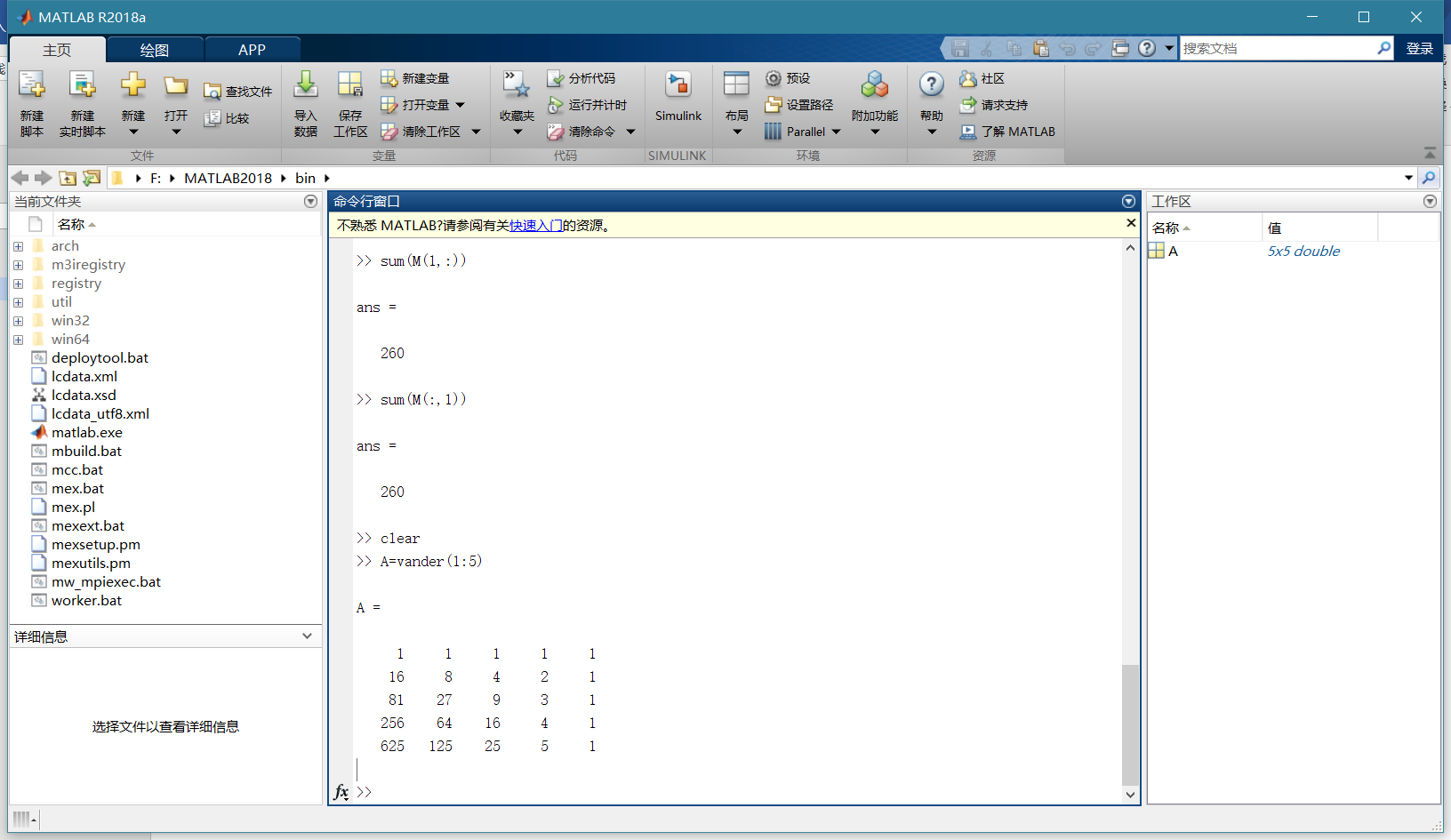
1 1 1 1 1

16 8 4 2 1

81 27 9 3 1

256 64 16 4 1

625 125 25 5 1



希尔伯特矩阵

>> format rat

>> H=hilb(4)

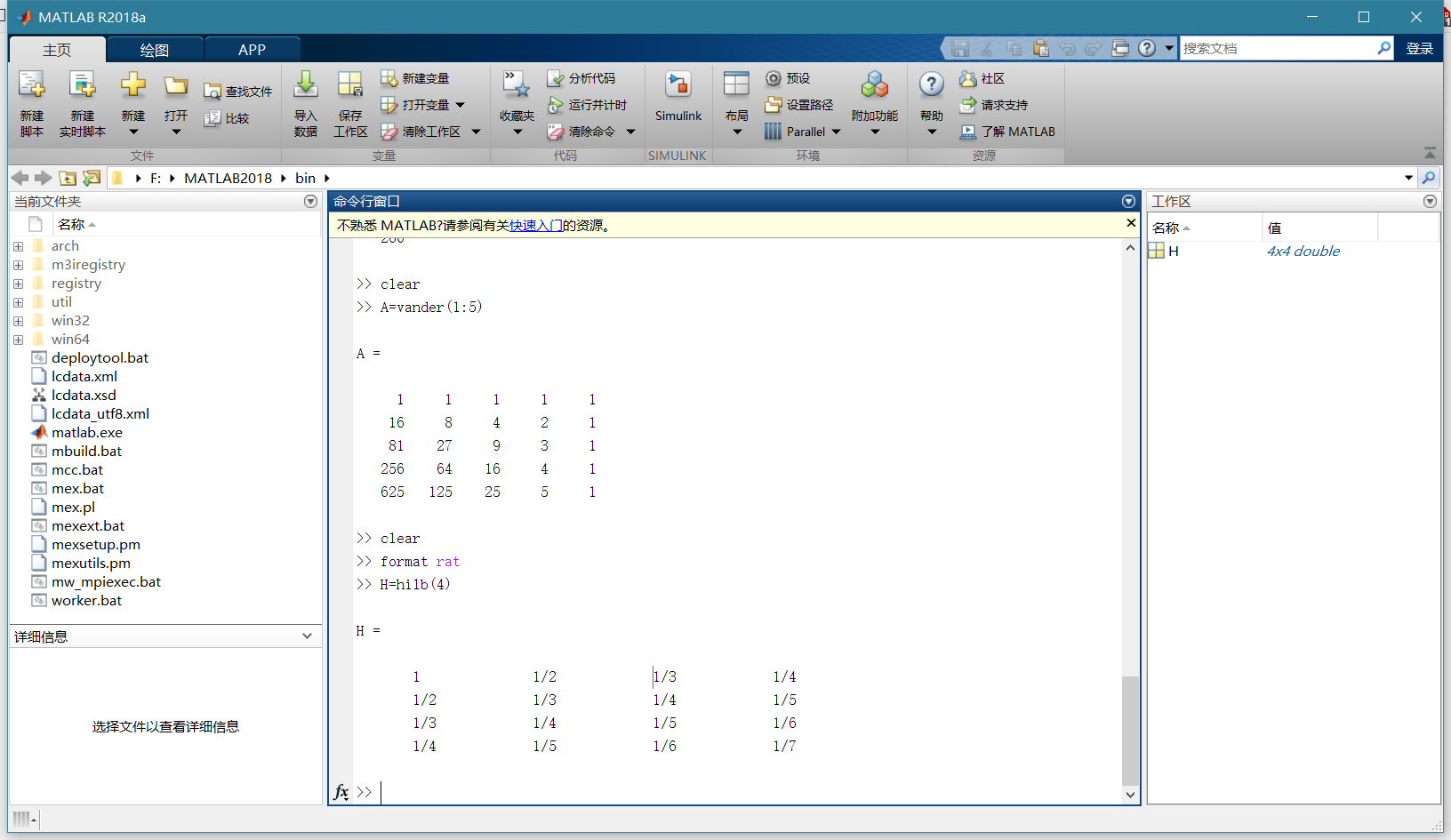
H =

1 1/2 1/3 1/4

1/2 1/3 1/4 1/5

1/3 1/4 1/5 1/6

1/4 1/5 1/6 1/7



伴随矩阵

>> p=[1,-2,-5,6]

p =

1 -2 -5 6

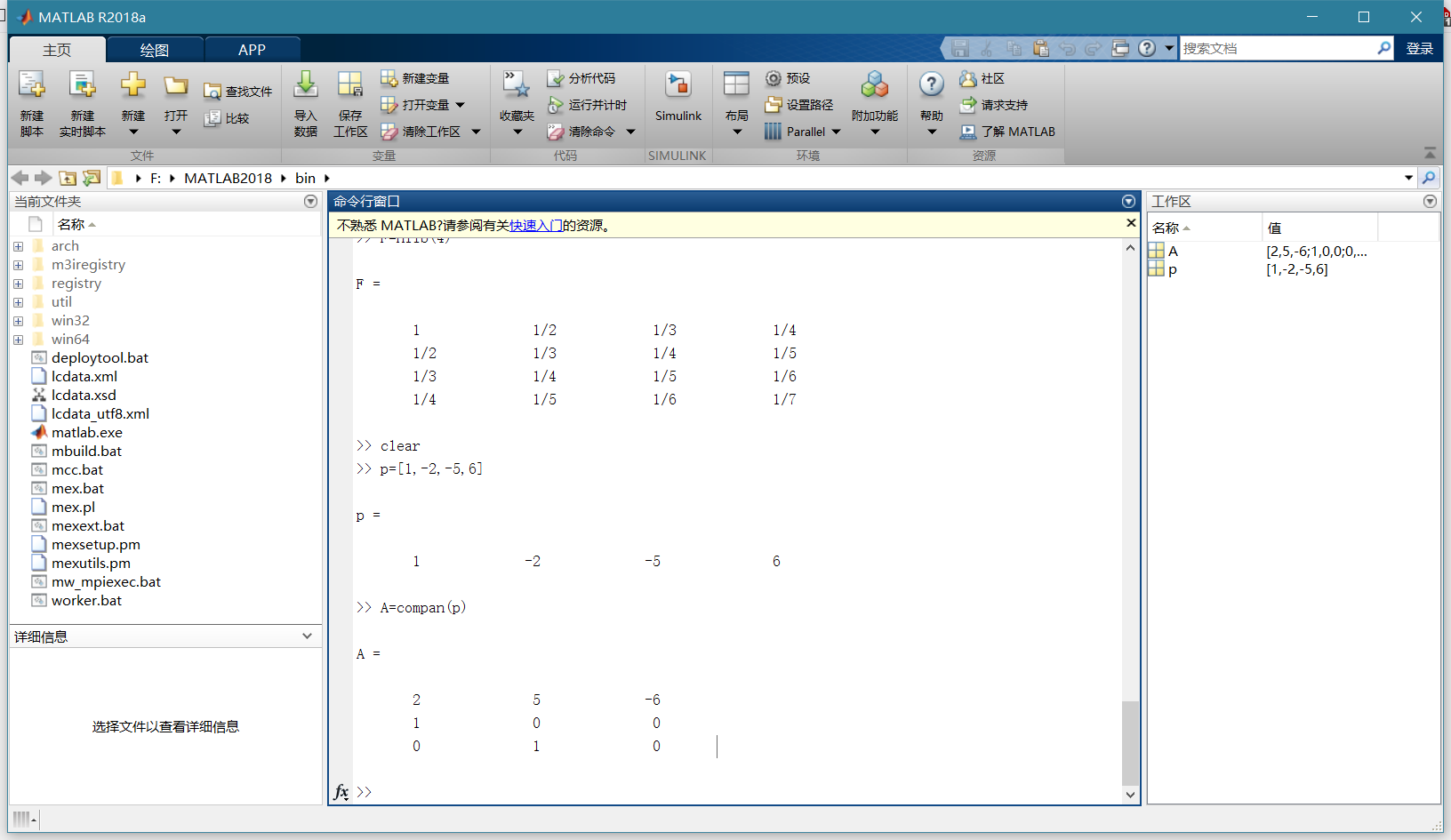
>> A=compan(p)

A =

2 5 -6

1 0 0

0 1 0



帕斯卡矩阵

>> format rat

>> P=pascal(5)

P =

1 1 1 1 1

1 2 3 4 5

1 3 6 10 15

1 4 10 20 35

1 5 15 35 70

>> inv(P)

ans =

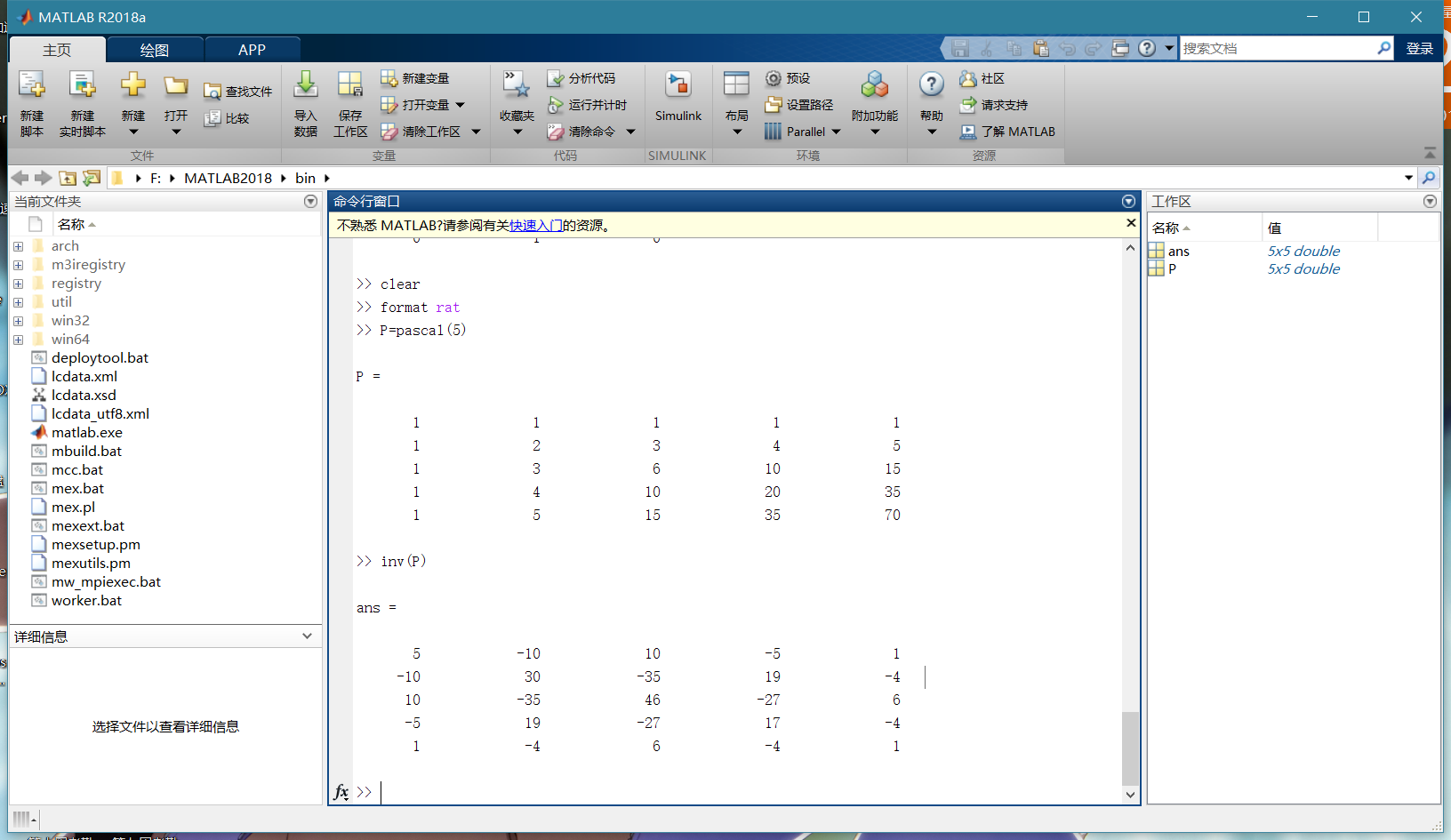
5 -10 10 -5 1

-10 30 -35 19 -4

10 -35 46 -27 6

-5 19 -27 17 -4

1 -4 6 -4 1



## 矩阵变换

对角阵

>> A=[7,0,1,0,5;3,5,7,4,1;4,0,3,0,2;1,1,9,2,3;1,8,5,2,9]

A =

7 0 1 0 5

3 5 7 4 1

4 0 3 0 2

1 1 9 2 3

1 8 5 2 9

>> D=dig(1:5)

未找到具有匹配签名的构造函数 'dig'。

>> D=diag(1:5)

D =

1 0 0 0 0

0 2 0 0 0

0 0 3 0 0

0 0 0 4 0

0 0 0 0 5

>> D\*A

ans =

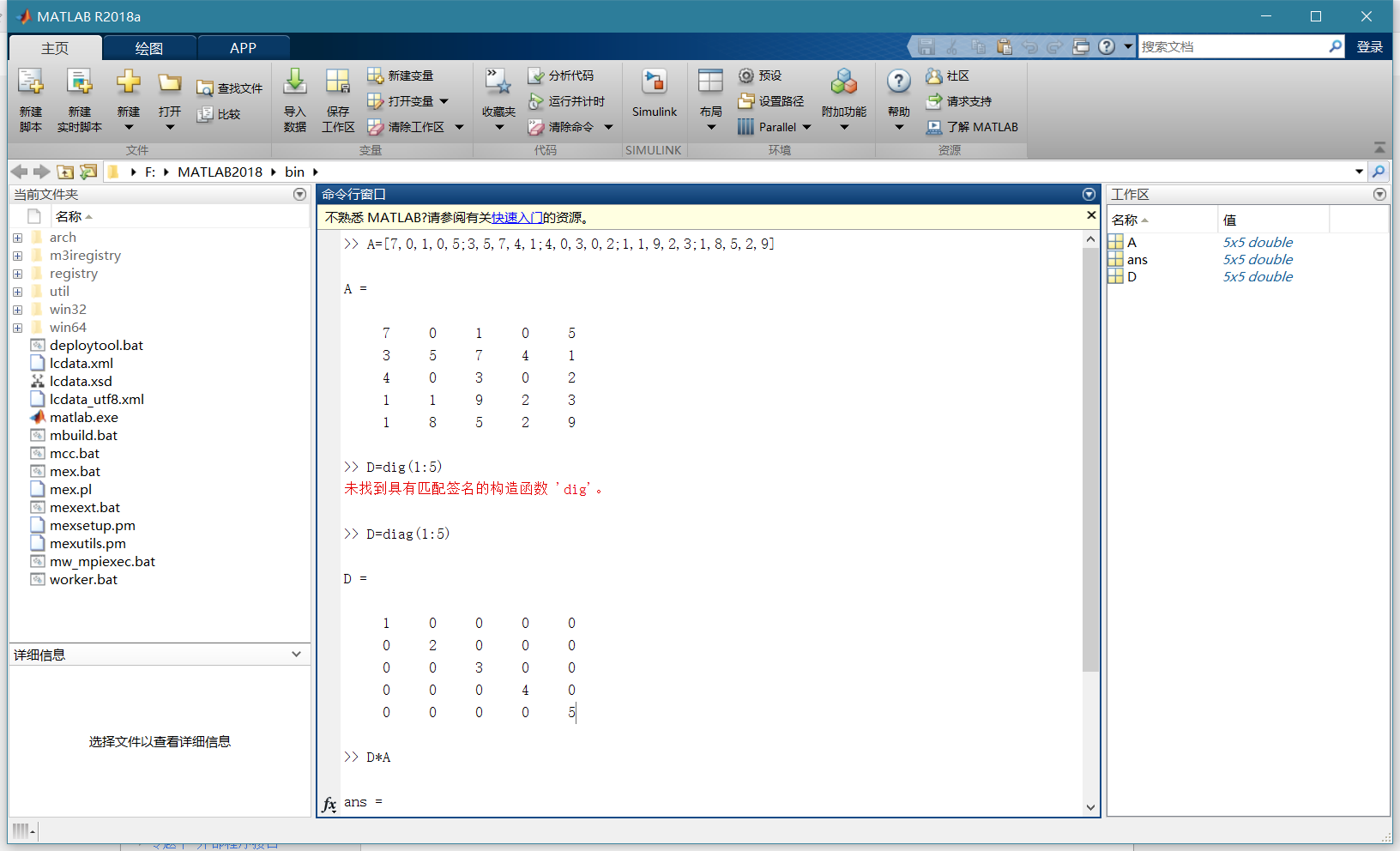
7 0 1 0 5

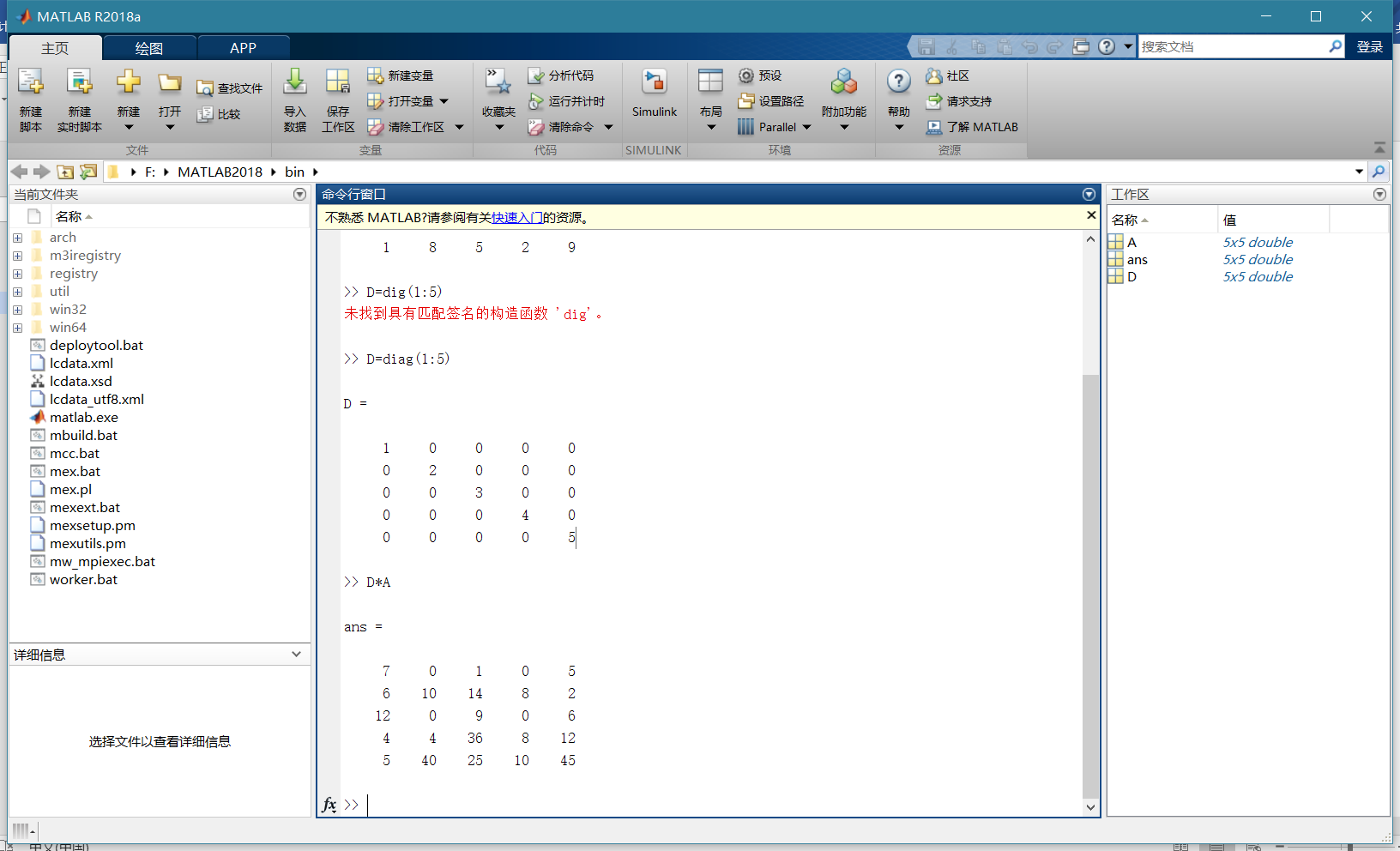
6 10 14 8 2

12 0 9 0 6

4 4 36 8 12

5 40 25 10 45







>> A\*D

ans =

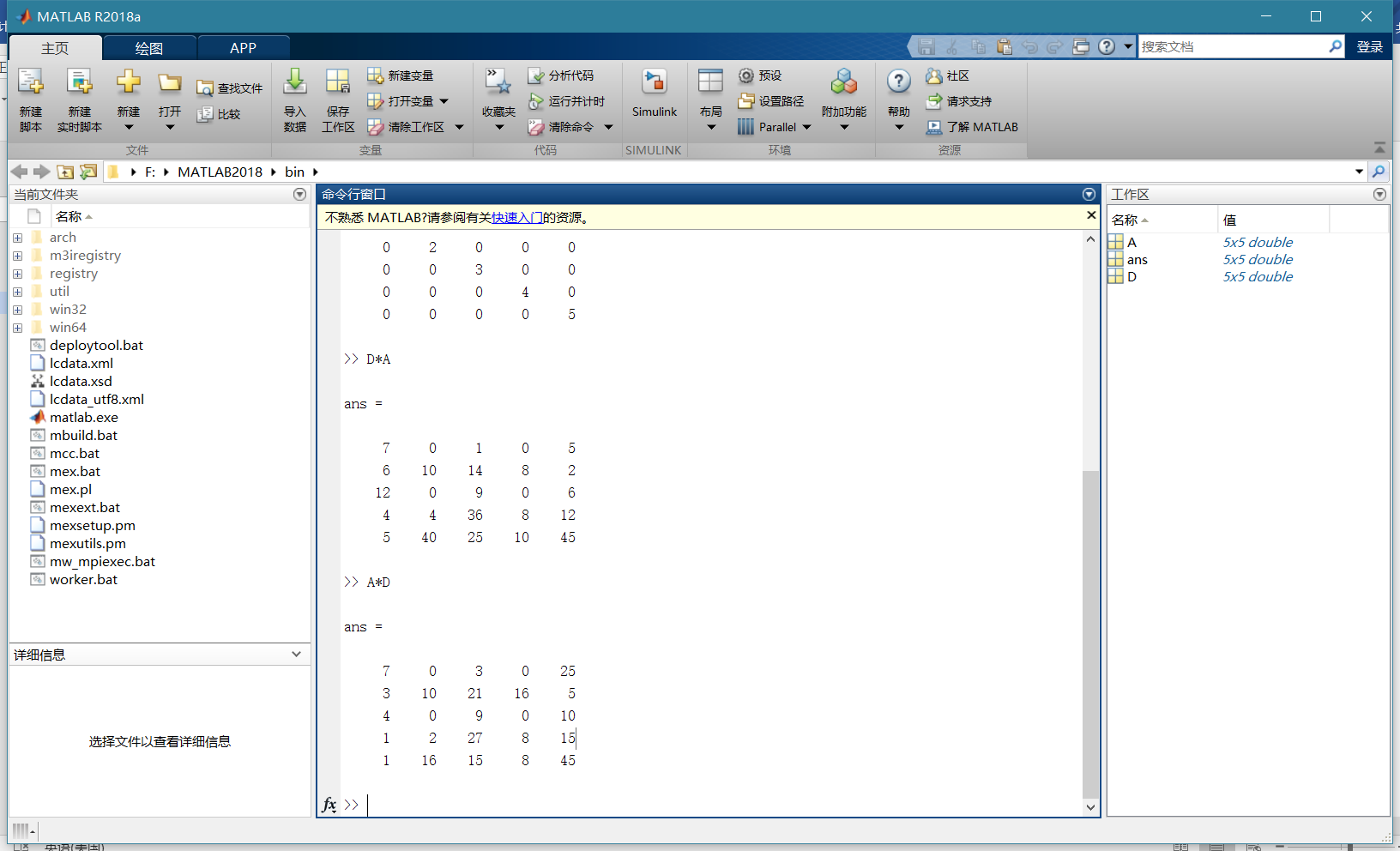
7 0 3 0 25

3 10 21 16 5

4 0 9 0 10

1 2 27 8 15

1 16 15 8 45



三角阵

>> triu(ones(4),-1)

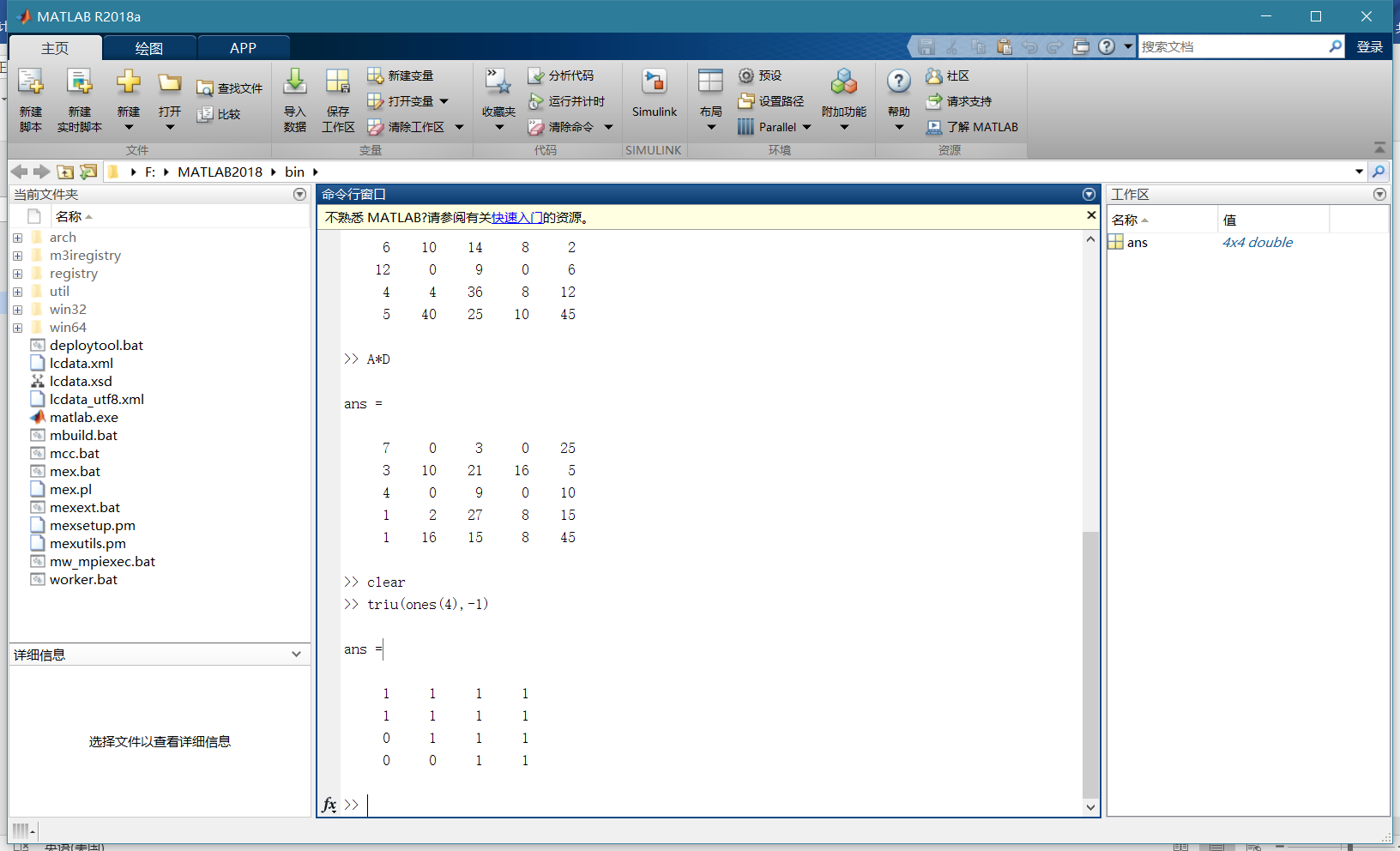
ans =

1 1 1 1

1 1 1 1

0 1 1 1

0 0 1 1



>> tril(ones(4),-1)

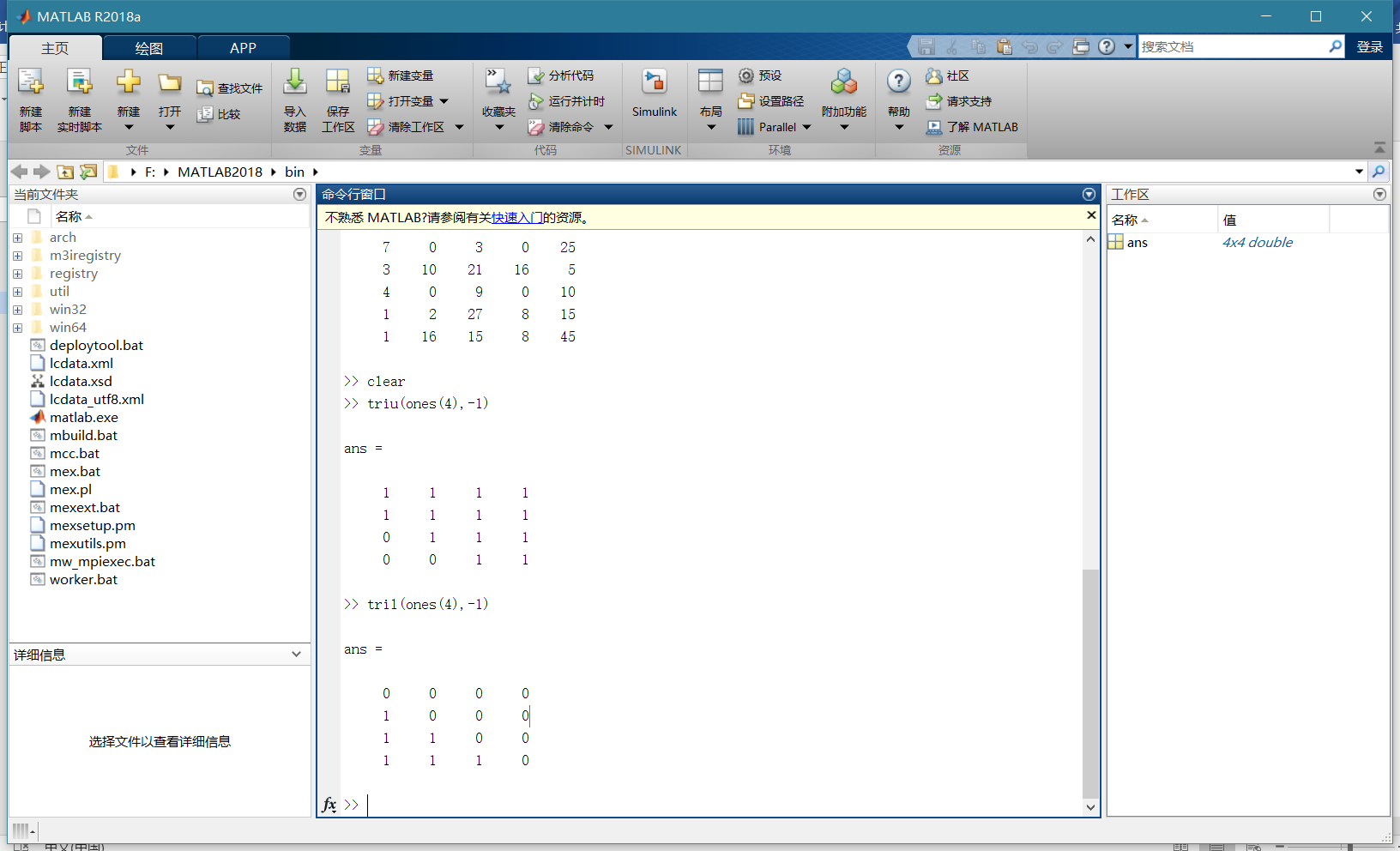
ans =

0 0 0 0

1 0 0 0

1 1 0 0

1 1 1 0



矩阵的转置

>> A=[1,3;3+4i,1-2i]

A =

1.0000 + 0.0000i 3.0000 + 0.0000i

3.0000 + 4.0000i 1.0000 - 2.0000i

>> A.'

ans =

1.0000 + 0.0000i 3.0000 + 4.0000i

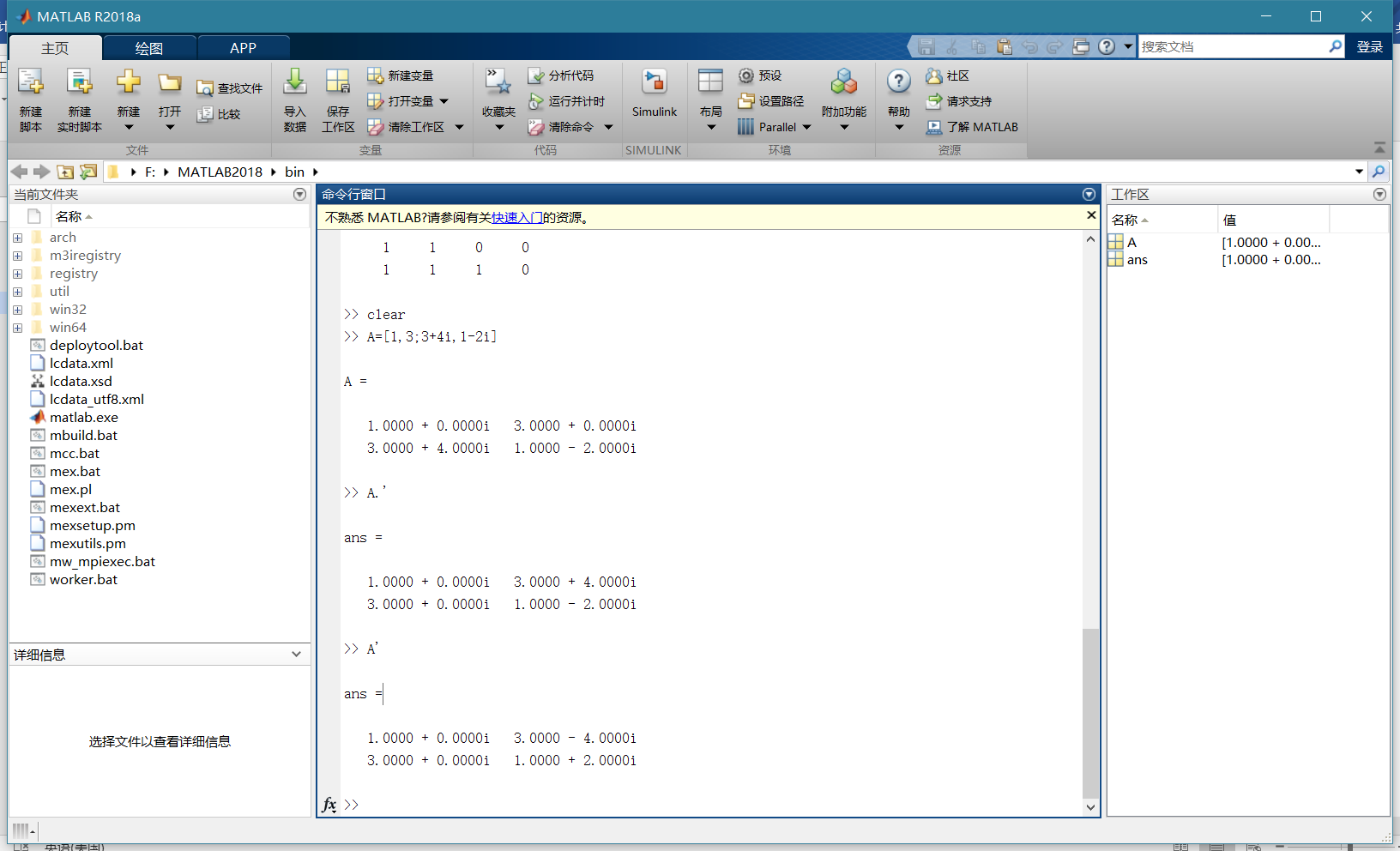
3.0000 + 0.0000i 1.0000 - 2.0000i

>> A'

ans =

1.0000 + 0.0000i 3.0000 - 4.0000i

3.0000 + 0.0000i 1.0000 + 2.0000i



矩阵的旋转

>> A=[1,3,2;-3,2,1;4,1,2]

A =

1 3 2

-3 2 1

4 1 2

>> rot90(A)

ans =

2 1 2

3 2 1

1 -3 4

>> rot90(A,2)

ans =

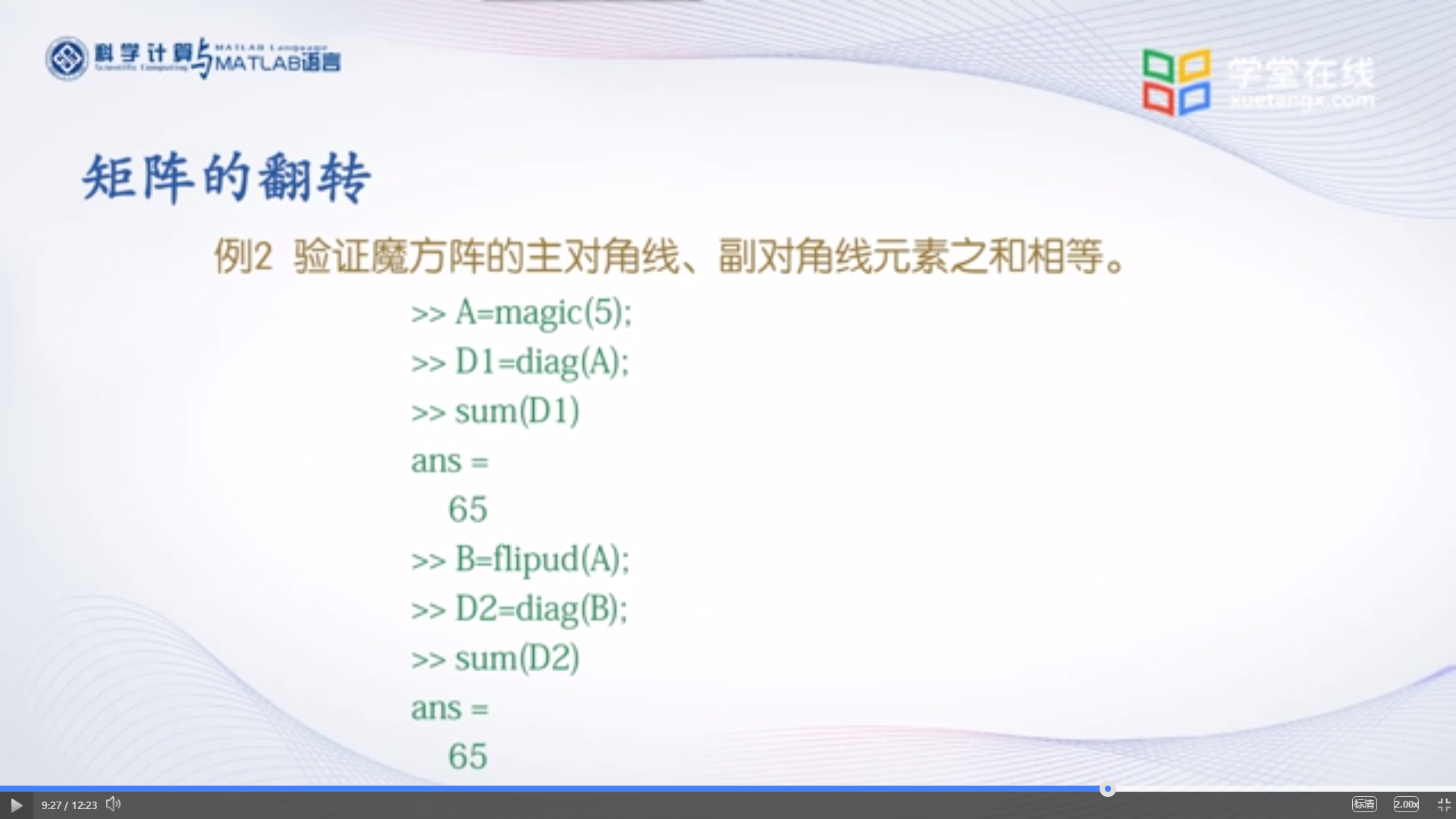
2 1 4

1 2 -3

2 3 1



矩阵的翻转



>> A=magic(5)

A =

17 24 1 8 15

23 5 7 14 16

4 6 13 20 22

10 12 19 21 3

11 18 25 2 9

>> D1=diag(A)

D1 =

17

5

13

21

9

>> sum(D1)

ans =

65

>> B=fliplr(A)

B =

15 8 1 24 17

16 14 7 5 23

22 20 13 6 4

3 21 19 12 10

9 2 25 18 11

>> C=flipud(A)

C =

11 18 25 2 9

10 12 19 21 3

4 6 13 20 22

23 5 7 14 16

17 24 1 8 15

>> D2=diag(D2)

未定义函数或变量 'D2'。

>> D2=diag(C)

D2 =

11

12

13

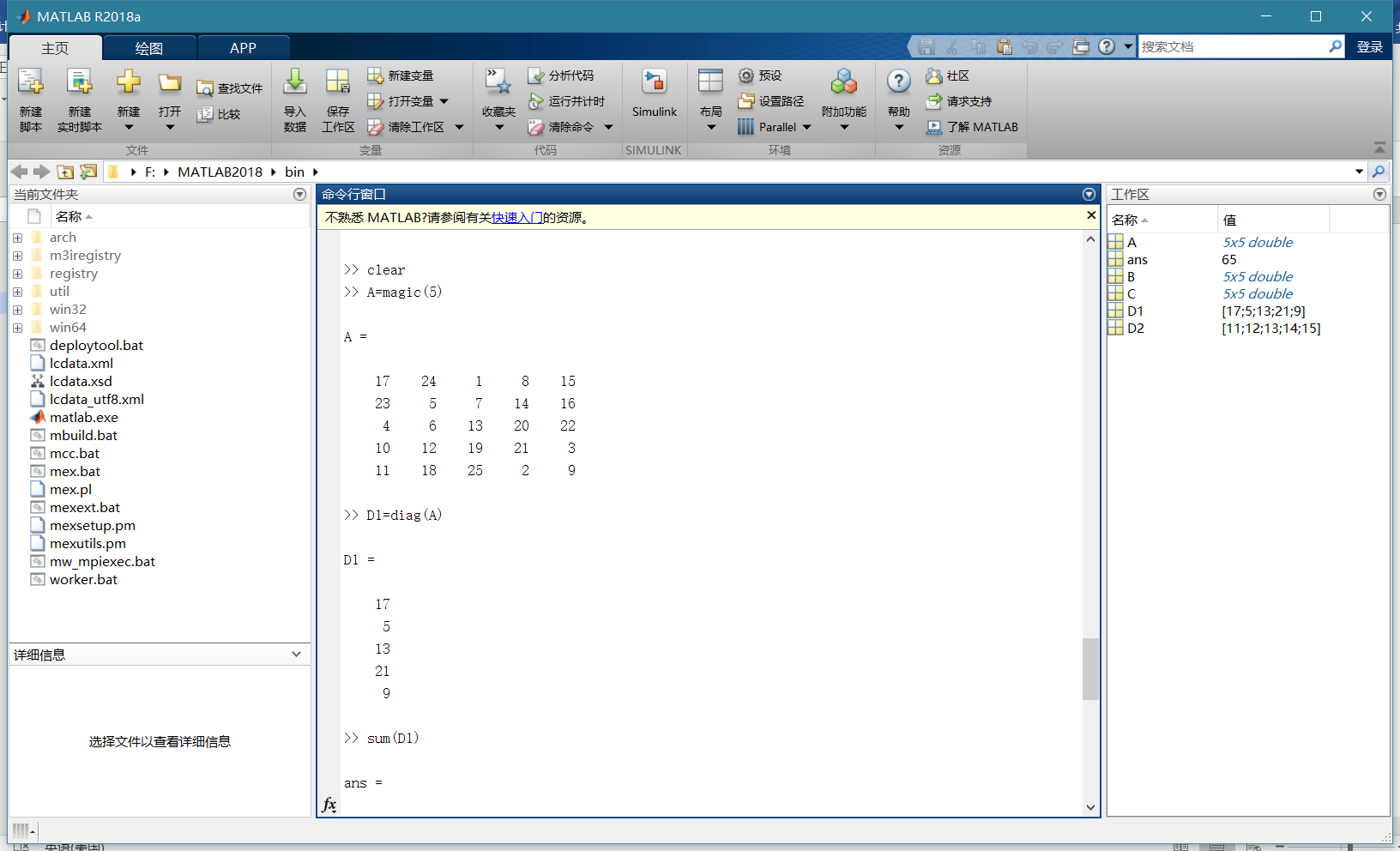
14

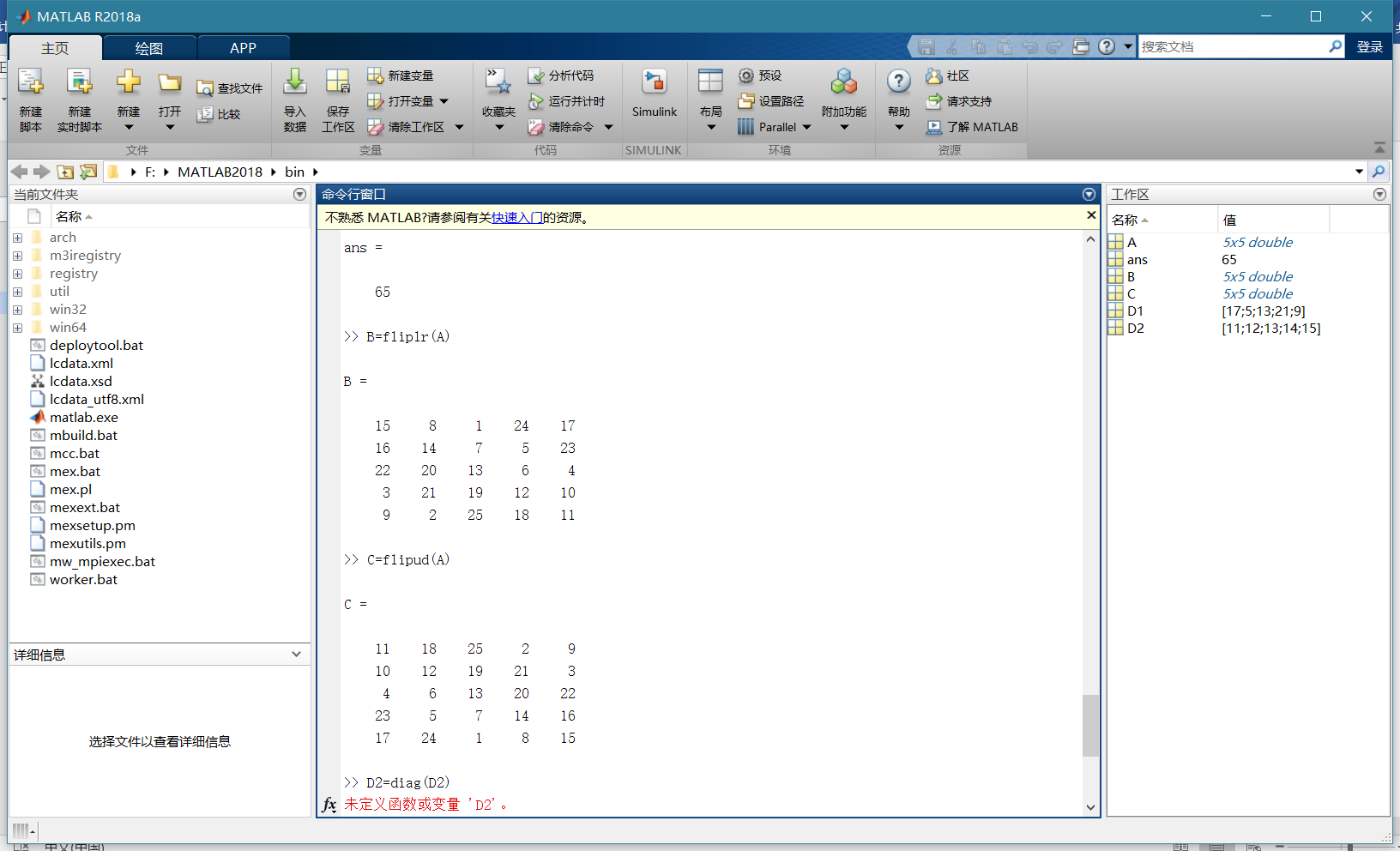
15

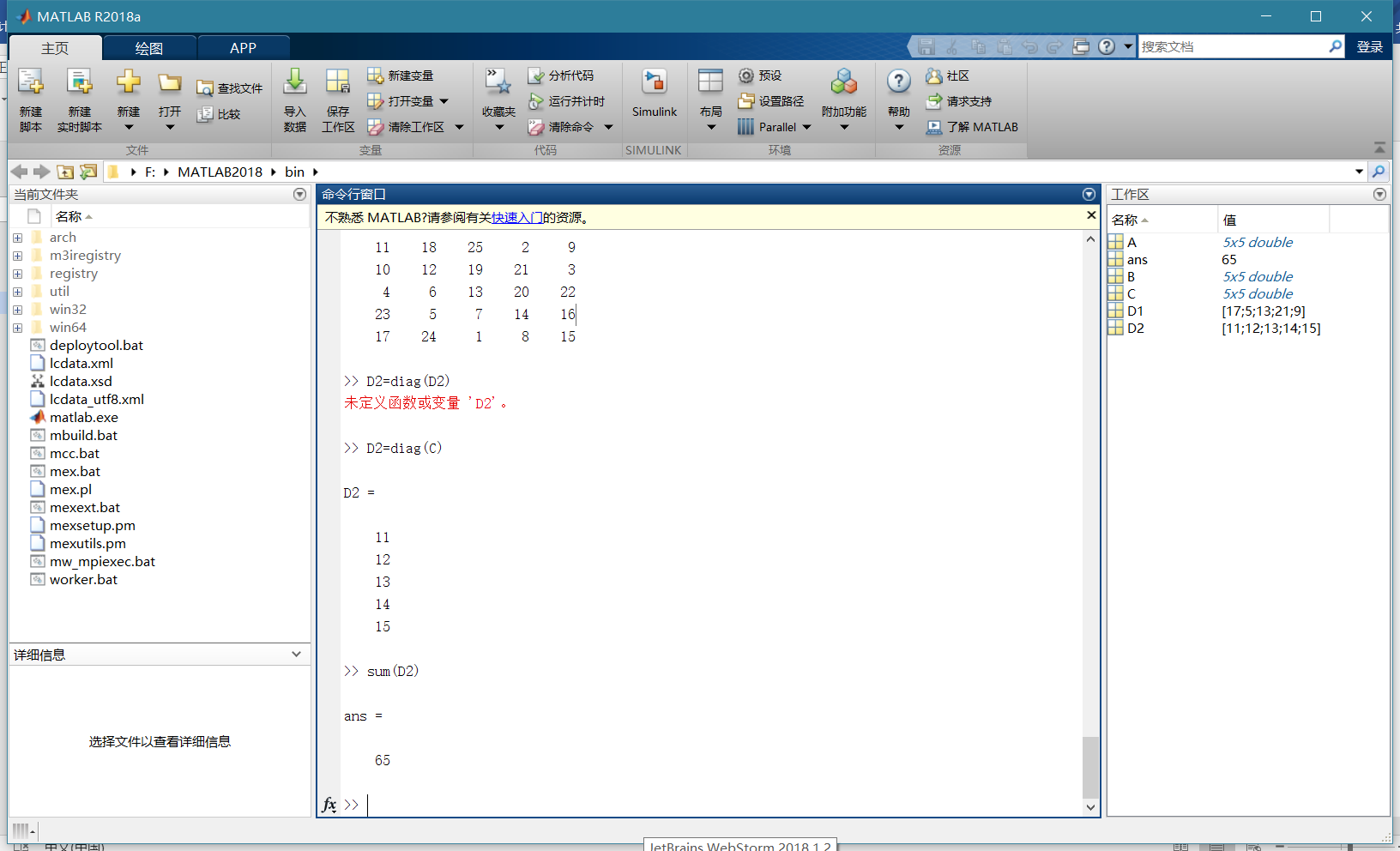
>> sum(D2)

ans =

65







矩阵的求逆

