

1.

i.

A =

1 1 1

1 -1 0

0 0 1

V =

-2.0000 2.4140 -0.4140

-1.0000 1.0000 1.0000

-1.0000 0 0

D =

1.000 0 0

0 1.4142 0

0 0 -1.4142

ii.

```
>> A=[1 1 1; 1 -1 0; 0 0 1];
```

```
>> [V,D]=eig(A);
```

```
>> A=V*D*inv(V)
```

A =

1.0000 1.0000 1.0000

1.0000 -1.0000 0.0000

0 0 1.0000

```
>> D=inv(V)*A*V
```

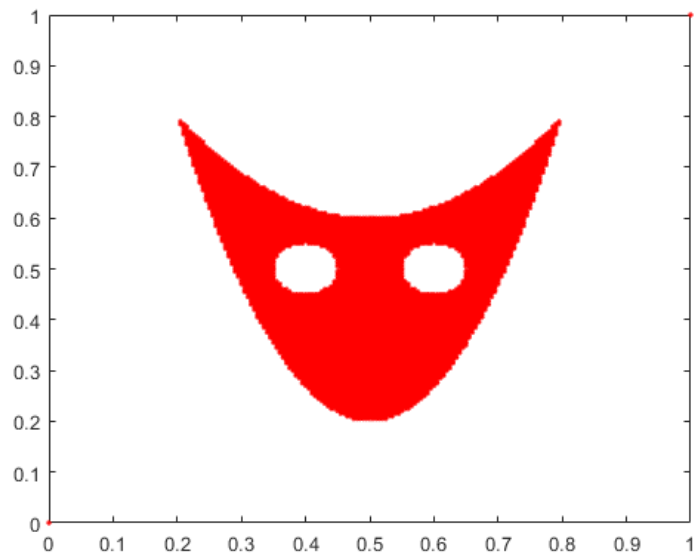
D =

1.4142 -0.0000 0.0000

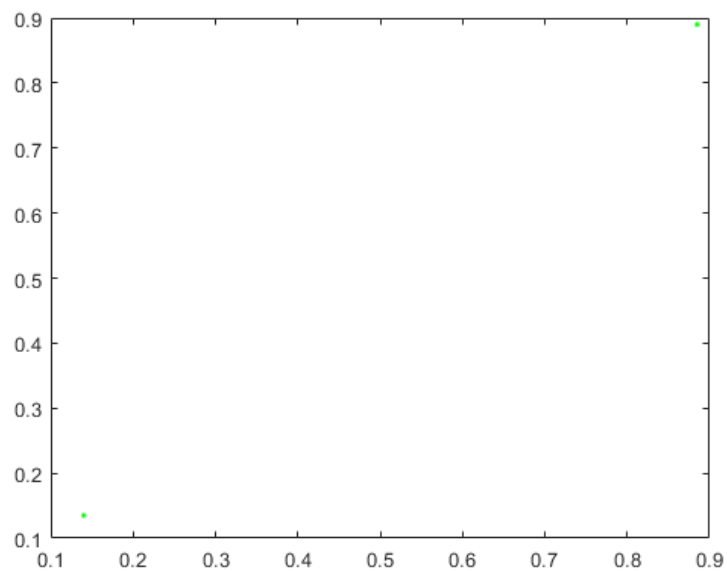
-0.0000 -1.4142 0.0000

0 0 1.0000

```
>> A=[1 2; -1 3];  
>> cat=load('catdata.txt');  
>> plot(cat(:,1),cat(:,2),'r.');
```

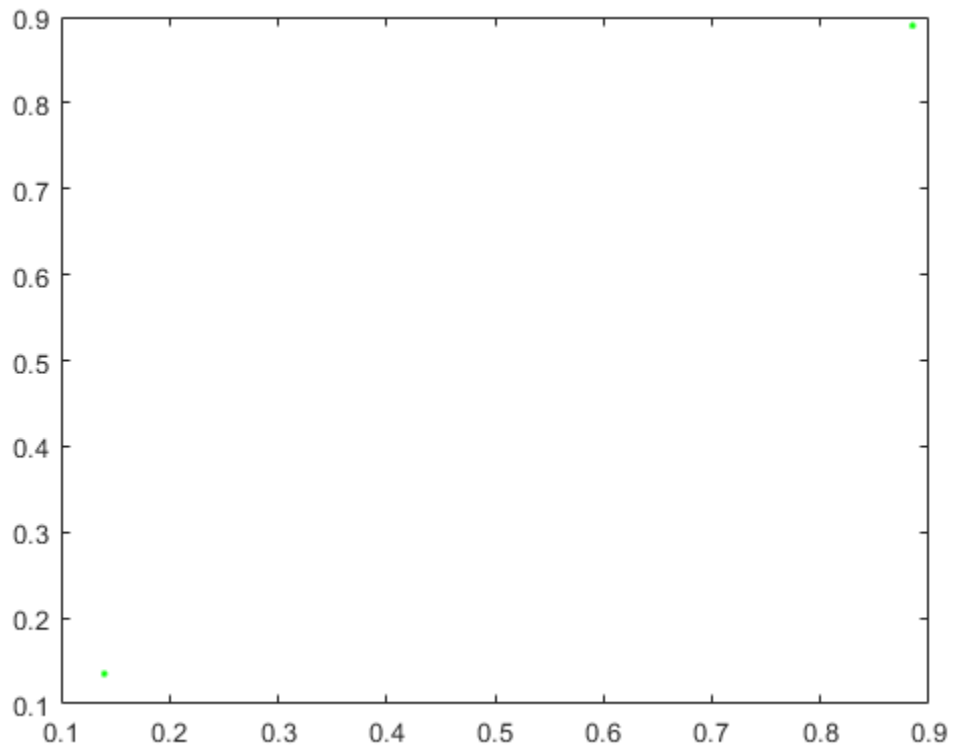


```
>> C=cat';  
>> Cnew=A*C;  
>> plot(Cnew(:,1),Cnew(:,2),'g.');
```



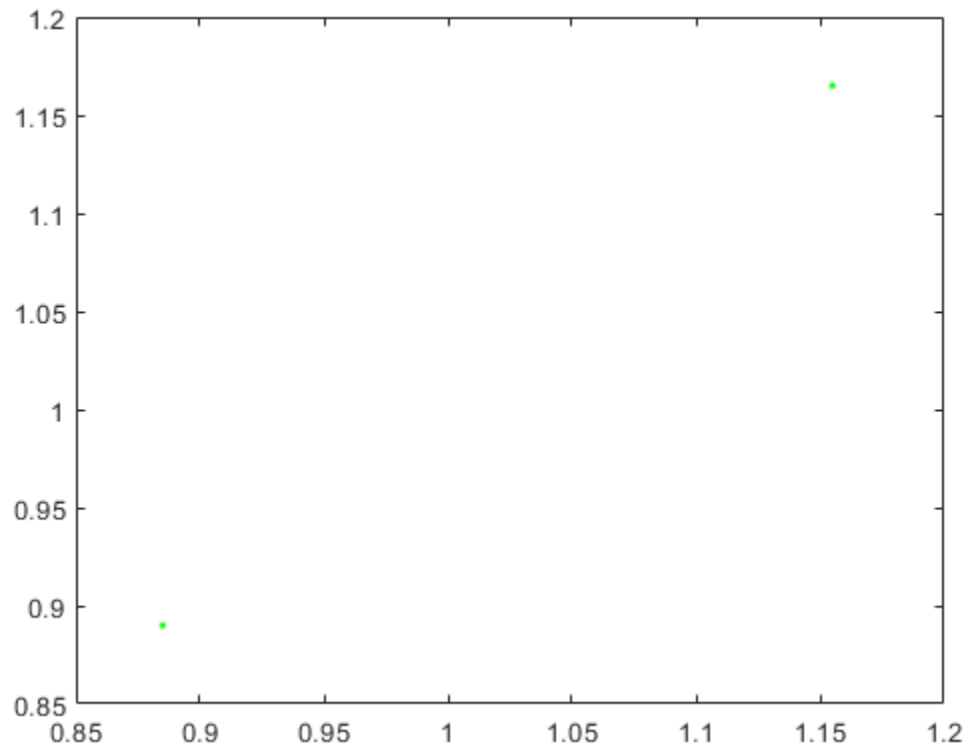
2.

```
>> A=[1 2; -1 3];  
>> [V,D]=eig(A);  
>> Cnew=A*C;  
>> plot(Cnew(:,1),Cnew(:,2),'g.');
```



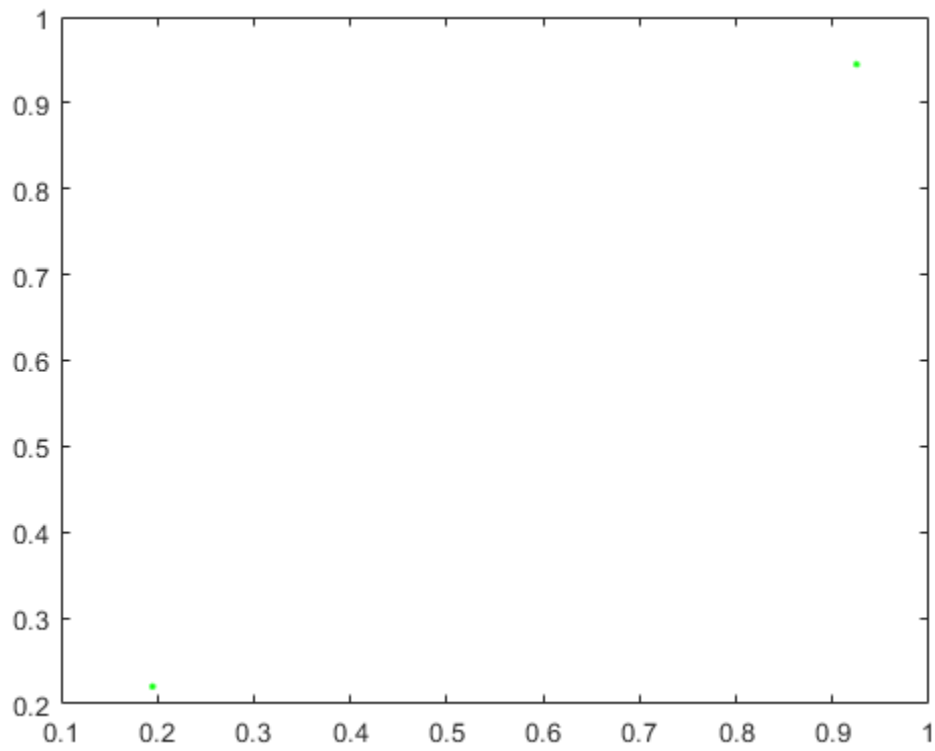
3.

```
>> A=[2 1; 1 2];  
>> [V,D]=eig(A);  
>> Cnew=A*C;  
>> plot(Cnew(:,1),Cnew(:,2),'g.');
```



4.

```
>> Cnew=mod(A*C,1);  
>> Cnew=mod(A*Cnew,1);  
>> plot(Cnew(:,1),Cnew(:,2),'g.');
```



Where would I see these patterns?