1.

```
clear;clc;clf
figure(1)
x = linspace(0,2*pi,100)
```

```
x = 1×100
         0    0.0635    0.1269    0.1904    0.2539    0.3173    0.3808    0.4443 ···
```

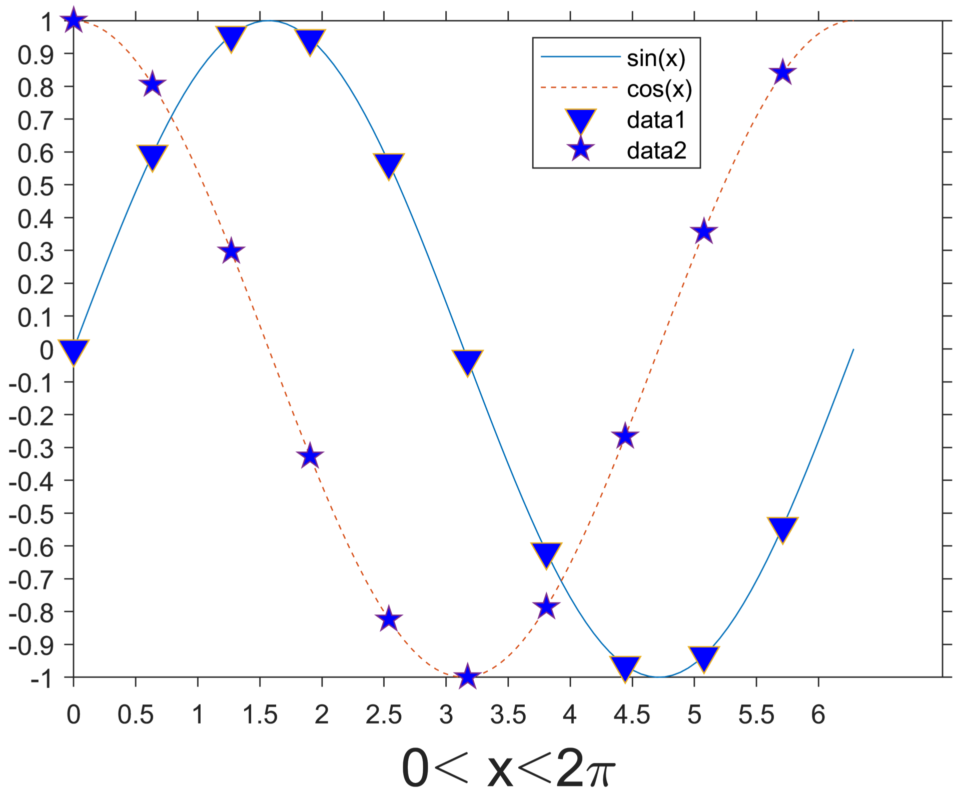
```
hx1=plot(x,sin(x),'-');hold on
hx2=plot(x,cos(x),'--')
```

```
hx2 =
  Line with properties:

              Color: [0.8500 0.3250 0.0980]
          LineStyle: '--'
          LineWidth: 0.5000
             Marker: 'none'
         MarkerSize: 6
    MarkerFaceColor: 'none'
              XData: [1×100 double]
              YData: [1×100 double]
              ZData: [1×0 double]

  Show all properties
```

```
set(gca,'tickdir','out','xtick',[0:0.5:2*pi],'ytick',[-1:0.1:1])
xlabel('0\leq x\leq2\pi',"FontSize",20)
legend([hx1,hx2],{'sin(x)','cos(x)'},'Location','best')
hold on
x2 = x(1:10:end)
```

```
x2 = 1×10
         0    0.6347    1.2693    1.9040    2.5387    3.1733    3.8080    4.4427 ···
```

```
plot(x2,sin(x2),'v','MarkerSize',10,'MarkerFaceColor','b')
hold on
plot(x2,cos(x2),'p','MarkerSize',10,'MarkerFaceColor','b')
% set(gca,'MarkerSize',10)
% set(gca,)
hold off
```



2.

(a)

```
clear;clc;clf
[x,y,z] = peaks
```

```
x = 49×49
   -3.0000   -2.8750   -2.7500   -2.6250   -2.5000   -2.3750   -2.2500   -2.1250 ···
   -3.0000   -2.8750   -2.7500   -2.6250   -2.5000   -2.3750   -2.2500   -2.1250
   -3.0000   -2.8750   -2.7500   -2.6250   -2.5000   -2.3750   -2.2500   -2.1250
   -3.0000   -2.8750   -2.7500   -2.6250   -2.5000   -2.3750   -2.2500   -2.1250
   -3.0000   -2.8750   -2.7500   -2.6250   -2.5000   -2.3750   -2.2500   -2.1250
   -3.0000   -2.8750   -2.7500   -2.6250   -2.5000   -2.3750   -2.2500   -2.1250
   -3.0000   -2.8750   -2.7500   -2.6250   -2.5000   -2.3750   -2.2500   -2.1250
   -3.0000   -2.8750   -2.7500   -2.6250   -2.5000   -2.3750   -2.2500   -2.1250
   -3.0000   -2.8750   -2.7500   -2.6250   -2.5000   -2.3750   -2.2500   -2.1250
   -3.0000   -2.8750   -2.7500   -2.6250   -2.5000   -2.3750   -2.2500   -2.1250
      ⋮

y = 49×49
   -3.0000   -3.0000   -3.0000   -3.0000   -3.0000   -3.0000   -3.0000   -3.0000 ···
   -2.8750   -2.8750   -2.8750   -2.8750   -2.8750   -2.8750   -2.8750   -2.8750
   -2.7500   -2.7500   -2.7500   -2.7500   -2.7500   -2.7500   -2.7500   -2.7500
   -2.6250   -2.6250   -2.6250   -2.6250   -2.6250   -2.6250   -2.6250   -2.6250
   -2.5000   -2.5000   -2.5000   -2.5000   -2.5000   -2.5000   -2.5000   -2.5000
   -2.3750   -2.3750   -2.3750   -2.3750   -2.3750   -2.3750   -2.3750   -2.3750
   -2.2500   -2.2500   -2.2500   -2.2500   -2.2500   -2.2500   -2.2500   -2.2500
   -2.1250   -2.1250   -2.1250   -2.1250   -2.1250   -2.1250   -2.1250   -2.1250
   -2.0000   -2.0000   -2.0000   -2.0000   -2.0000   -2.0000   -2.0000   -2.0000
   -1.8750   -1.8750   -1.8750   -1.8750   -1.8750   -1.8750   -1.8750   -1.8750
```

```
      ⋮
z = 49×49
    0.0001    0.0001    0.0002    0.0004    0.0007    0.0011    0.0017    0.0025 ···
    0.0001    0.0002    0.0004    0.0006    0.0010    0.0017    0.0026    0.0037
    0.0002    0.0003    0.0005    0.0009    0.0016    0.0025    0.0038    0.0055
    0.0002    0.0004    0.0008    0.0014    0.0023    0.0036    0.0055    0.0079
    0.0003    0.0006    0.0011    0.0019    0.0032    0.0051    0.0077    0.0110
    0.0004    0.0008    0.0015    0.0026    0.0044    0.0070    0.0106    0.0151
    0.0005    0.0010    0.0019    0.0034    0.0058    0.0093    0.0141    0.0203
    0.0007    0.0013    0.0024    0.0043    0.0073    0.0118    0.0182    0.0266
    0.0007    0.0015    0.0028    0.0051    0.0088    0.0145    0.0227    0.0337
    0.0008    0.0015    0.0030    0.0056    0.0100    0.0168    0.0270    0.0410
      ⋮
```

```
figure(2)
pcolor(x,y,z)
% shading interp % 做線性內插（減少色階差異）
colorbar('v')

m = colormap('jet') %三個column代表RGB
```

```
m = 64×3
         0         0    0.5625
         0         0    0.6250
         0         0    0.6875
         0         0    0.7500
         0         0    0.8125
         0         0    0.8750
         0         0    0.9375
         0         0    1.0000
         0    0.0625    1.0000
         0    0.1250    1.0000
      ⋮
```

(b)

```
load tryc.txt %載入自己的資料變數,值為0到1之間的5*3陣列
colormap(tryc)
```

3.

```
clear;clc;clf
figure(3)
x = linspace(-2*pi,2*pi,100);
y = exp(-x.^2);
plot(x,y)
xlabel('0\leq x\leq2\pi')
ylabel('y=e^-^{x^2}')
get(gca,'position')
axes('position',[0.6 0.59 0.3 0.325])
y2 = exp(-x)
plot(x,y2)
text(0,400,'y = e^-^x',"FontSize",20)
```

4.(a)

```
clear;clc;clf
x = linspace(0,pi,50)
y = exp(-0.5.*x).*cos(x)
plot(x,y,'r--o','MarkerFaceColor','b','MarkerSize',20)
title('\it My plot(\rho,\xi)','FontName','Helvetica','FontSize',14)
```

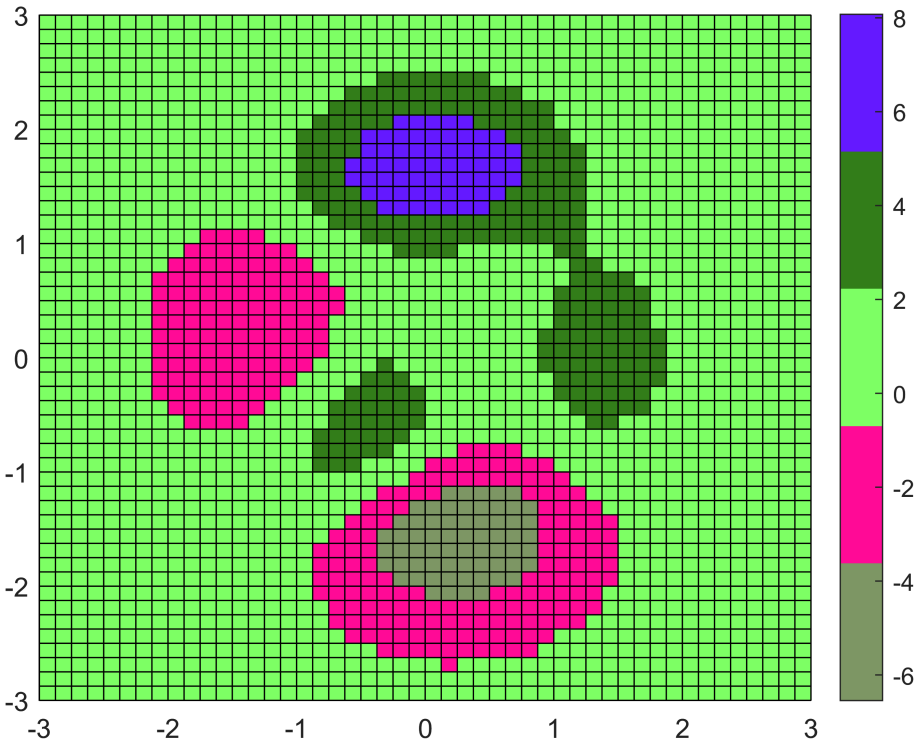
5.

```
clear;clc;clf
x = linspace(-2*pi,2*pi,100)
y2 = exp(-x)
plot(x,y2)
text(0,400,'y = e^-^x','Color','r','FontName','times',"FontSize",20,"Rotation",45)
```

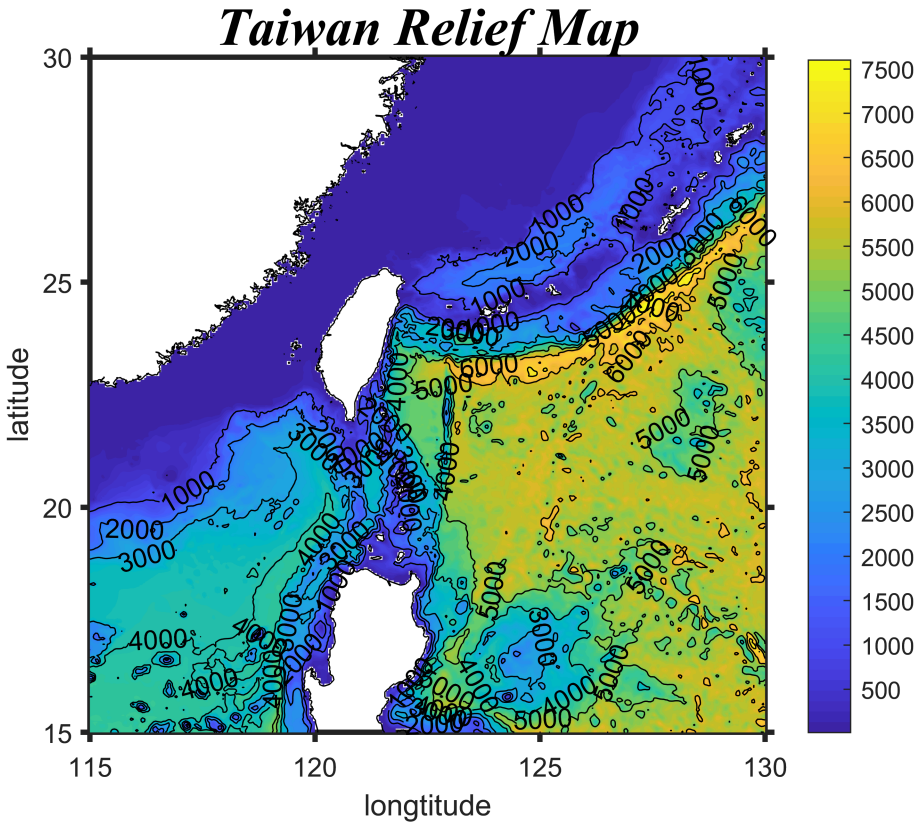
6.

```
clear;clc;clf
load kuroshio_grid.lat
load taiwan_coast.dat
c1 = 'kuroshio_grid'
c2 = 'taiwan_coast'
%%
figure(1)
plot(taiwan_coast(:,1),taiwan_coast(:,2))

%%
figure(2)
lon22 = reshape(kuroshio_grid(:,3),361,361);
lat22 = reshape(kuroshio_grid(:,4),361,361);
deep22 = reshape(kuroshio_grid(:,5),361,361);
deep22(deep22 == 1) = nan;
pcolor(lon22,lat22,deep22);shading interp
colormap('default')
colorbar('Ticks',[500:500:8000])

hold on
[c1,h1] = contour(lon22,lat22,deep22,'k')
clabel(c1,h1)

hold on
plot(taiwan_coast(:,1),taiwan_coast(:,2),'k','MarkerSize',5)
hold off

axis('image')
axis([115 130 15 30])
title('Taiwan Relief Map','FontName','times','FontSize',20,'FontAngle',"italic")
xlabel('longtitude');ylabel('latitude')
set(gca,'LineWidth',2,'tickdir','out')


% load kuroshio_grid.lat
% load taiwan_coast.dat
% c1 = 'kuroshio_grid'
```

```
% c2 = 'taiwan_coast'
% cc1=eval(c1);
% lon1 = cc1(:,3);
% lat1 = cc1(:,4);
% d = cc1(:,5);
% %-------------關鍵過程--------資料被調整過，要把130321(361*361)調回來361*361-----------
% lon11 = reshape(lon1,361,361);
% lat11 = reshape(lat1,361,361);
% deep = reshape(d,361,361)
% %-------------------------------------------------------------------------------------
% cc2=eval(c2);
% lon2 = cc2(:,1)
% lat2 = cc2(:,2)
% %% 畫圖
% pcolor(lon11,lat11,deep)
% shading interp
%
% hold on
% % [x,y,dd] = meshgrid(lon1,lat1,deep)
% [c1,h1] = contour(lon11,lat11,deep,'k')
% clabel(c1,h1)

% [xx,yy] = meshgrid(lon1,lat1)
% contour(lon1,lat1,deep)
% hold on
% plot(lon2,lat2)
% hold off
% set(gca,'tickdir','out')
% colorbar('h')
% colormap('jet')
% axis('image')
```




```
ans = 1×4
    0.1300    0.1100    0.7750    0.8150
y2 = 1×100
  535.4917  471.6571  415.4321  365.9096  322.2905  283.8711  250.0315  220.2259 ···
x = 1×50
         0    0.0641    0.1282    0.1923    0.2565    0.3206    0.3847    0.4488 ···
y = 1×50
    1.0000    0.9665    0.9302    0.8916    0.8509    0.8085    0.7647    0.7199 ···
x = 1×100
   -6.2832   -6.1563   -6.0293   -5.9024   -5.7755   -5.6485   -5.5216   -5.3947 ···
y2 = 1×100
  535.4917  471.6571  415.4321  365.9096  322.2905  283.8711  250.0315  220.2259 ···
c1 =
'kuroshio_grid'
c2 =
'taiwan_coast'
c1 = 2×19134
10^3 ×
    1.0000    0.1199    0.1199    0.1199    0.1199    0.1199    0.1199    0.1199 ···
    0.4230    0.0150    0.0150    0.0151    0.0151    0.0151    0.0152    0.0152
h1 =
  Contour with properties:

    LineColor: [0 0 0]
    LineStyle: '-'
    LineWidth: 0.5000
         Fill: 'off'
    LevelList: [1000 2000 3000 4000 5000 6000 7000]
        XData: [361×361 double]
        YData: [361×361 double]
        ZData: [361×361 double]

  Show all properties
```


Taiwan Relief Map
latitude
longtitude
30
25
20
15
115
120
125
130
7500
7000
6500
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500