1.

```
clear;clc
a = [36 48 87 62 60 52 66 73 73 89 36 12 62 50 60 70 88 90 65]
```

```
a = 1×19
    36    48    87    62    60    52    66    73    73    89    36    12    62 ···
```

```
a1 = mean(a)
```

```
a1 = 62.0526
```

```
% h = hist(a,5)
hist(a,5)
```

```
% help hist
h = findobj(gca,'Type','patch');
h.FaceColor = [0 1 1];
```

2.

```
clear;clc;clf
sp = 138
```

```
sp = 138
```

```
sm = 187
```

```
sm = 187
```

```
at = 92
```
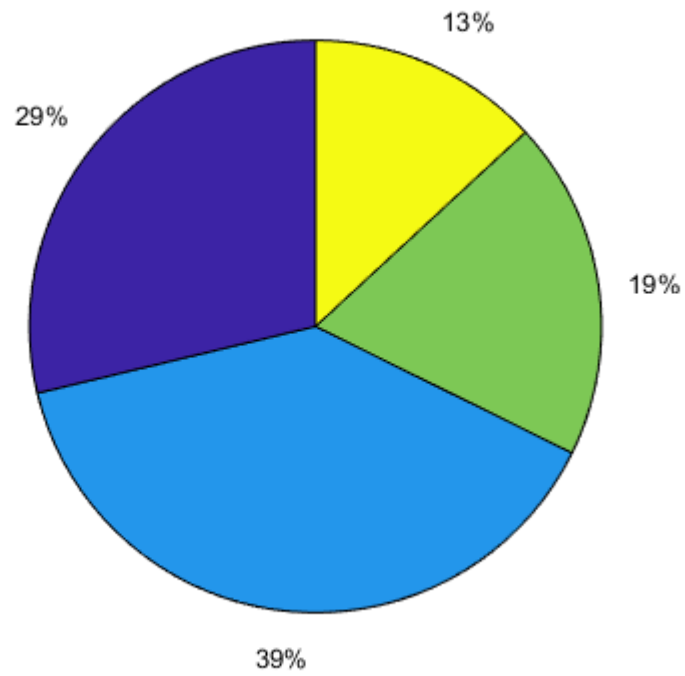
```
at = 92
```

```
wi = 63
```

```
wi = 63
```

```
% yr = categorical({'春 : 138mm','夏 : 187mm','秋 : 92mm','冬 : 63mm'});
yr = [sp sm at wi]
```

```
yr = 1×4
   138   187    92    63
```
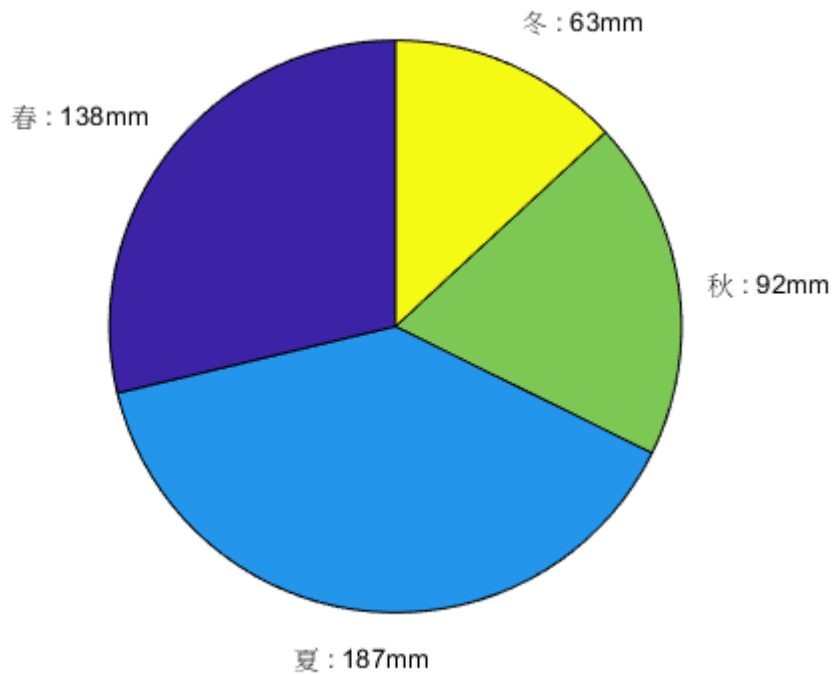
```
% figure(1)
p1 = pie(yr)
```

```
p1 =
  1×8 graphics array:

    Patch    Text    Patch    Text    Patch    Text    Patch    Text
```

```matlab
% figure(2)
p2 = pie(yr,{'春 : 138mm','夏 : 187mm','秋 : 92mm','冬 : 63mm'})
```

```
p2 =
  1×8 graphics array:

    Patch    Text    Patch    Text    Patch    Text    Patch    Text
```

```
% ,{'春','夏','秋','冬'}
% legend('春 : 138mm','夏 : 187mm','秋 : 92mm','冬 : 63mm','location','best')
```

3.

```
clear;clc
x = 20
```

```
x = 20
```

```
ex7_6(x)
```

```
exp(x) = 2.712523e+08
```

4.

```
clear;clc;clf
d = [22 109 116 34.5 240 122;...
    407.1 605 350.5 55.8 596.3 142.8;...
    69 259.5 251.8 49.4 603.4 204;...
    0.1 43 16.5 4.4 310 704.5]
```

```
d = 4×6
   22.0000  109.0000  116.0000   34.5000  240.0000  122.0000
```

```
  407.1000   605.0000   350.5000    55.8000   596.3000   142.8000
   69.0000   259.5000   251.8000    49.4000   603.4000   204.0000
    0.1000    43.0000    16.5000     4.4000   310.0000   704.5000
```

```matlab
% figure(1)
bar(d)
legend('Jan','Feb','Mar','Apr','May','June','location','northwest')
```

```matlab
% figure(2)
bar(d,'stacked')
legend('Jan','Feb','Mar','Apr','May','June','location','northeast')
```

5.

```matlab
clear;clc
bmi(1.79,70);
```

```
BMI = 21.847 : 體重標準
```

6.

```matlab
clear;clc;clf
m_proj('Mercator','lon',[110 130],'lat',[10 30]);
m_elev('pcolor');
% m_elev('contourf');
shading interp;
m_coast('patch',[.3 .3 .3]);
colormap('jet');
colorbar('v');
[c,h] = m_elev('contour',[-7000:500:0],'edgecolor','k');
clabel(c,h);
% text(126,20,'Pacific Ocean','color','c','rotation',80)
m_grid('box','fancy');

title('Topography of the area off Taiwan')
xlabel('longtitude');ylabel('latitude')
```

Topography of the area off Taiwan
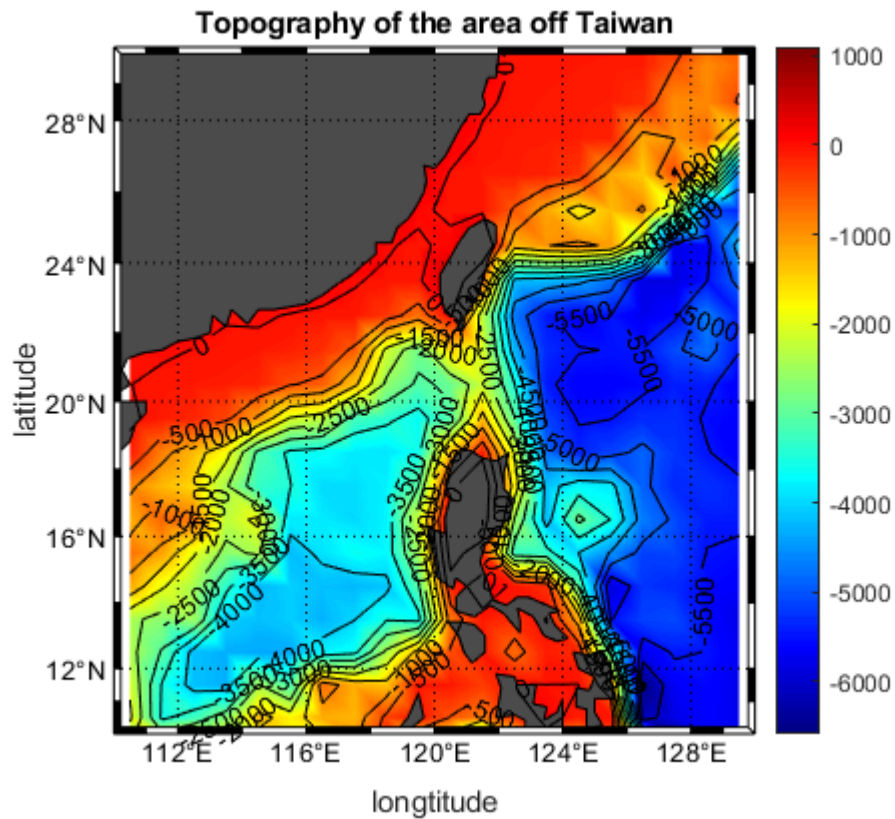
7.

```
clear;clc;clf
ncdisp("final_exam2020.nc")
```

```
Source:
         C:\Users\user\Documents\MATLAB\00781035\final_exam2020.nc
Format:
         classic
Global Attributes:
         title               = 'AVHRR PATHFINDER SEA SURFACE TEMPERATURE'
         temporal_resolution = 'Five Day Average'
         spatial_resolution  = '0.5 degree'
         creation_date       = 'Thu Aug 15 10:40:39 2002'
         originating_center  = 'NASA JPL PO.DAAC'
         WOCE_Version        = '3.0-PF4.1'
         Conventions         = 'COARDS/WOCE'
Dimensions:
         time      = 1
         depth     = 1
         latitude  = 360
         longitude = 720
Variables:
    woce_date
         Size:       1x1
         Dimensions: time
         Datatype:   int32
         Attributes:
```

```
                              long_name      = 'WOCE date'
                              units          = 'yyyymmdd'
                              data_min       = 19900101
                              data_max       = 19900105
                              FORTRAN_format = 'I8'
                              time_interval  = 'five days'
woce_time
        Size:      1x1
        Dimensions: time
        Datatype:  single
        Attributes:
                              long_name      = 'WOCE time'
                              units          = 'hhmmss.dd UTC'
                              data_min       = 0
                              data_max       = 235959
                              FORTRAN_format = 'F9.2'
time
        Size:      1x1
        Dimensions: time
        Datatype:  single
        Attributes:
                              long_name      = 'time'
                              units          = 'days since 1990-01-01 00:00:00'
                              data_min       = 0
                              data_max       = 4
                              FORTRAN_format = 'I4'
                              time_interval  = 'five days'
latitude
        Size:      360x1
        Dimensions: latitude
        Datatype:  single
        Attributes:
                              long_name         = 'latitude'
                              units             = 'degrees_N'
                              data_min          = -66.75
                              data_max          = 66.75
                              valid_min         = -89.75
                              valid_max         = 89.75
                              FORTRAN_format    = 'F6.2'
                              spatial_resolution = '0.5 degree'
longitude
        Size:      720x1
        Dimensions: longitude
        Datatype:  single
        Attributes:
                              long_name         = 'longitude'
                              units             = 'degrees_E'
                              data_min          = 0.25
                              data_max          = 359.75
                              valid_min         = 0.25
                              valid_max         = 359.75
                              FORTRAN_format    = 'F6.2'
                              spatial_resolution = '0.5 degree'
depth
        Size:      1x1
        Dimensions: time
        Datatype:  single
        Attributes:
                              long_name      = 'depth'
                              units          = 'meters'
                              positive       = 'down'
                              data_min       = 0
                              data_max       = 0
                              FORTRAN_format = 'F3.0'
sst
```

```
        Size:        720x360
        Dimensions: longitude,latitude
        Datatype:    int16
        Attributes:
                    long_name       = 'sea surface temperature'
                    units           = 'degree C'
                    data_min        = -2.84
                    data_max        = 32.1
                    valid_min       = -3
                    valid_max       = 36
                    FORTRAN_format = 'f6.3'
                    _FillValue      = 327.67
                    missing_value   = 327.66
                    scale_factor    = 0.01
                    add_offset      = 0
                    instrument      = 'AVHRR'
                    comment         = 'land = 327.66'
    bin_count
        Size:        720x360
        Dimensions: longitude,latitude
        Datatype:    int8
        Attributes:
                    long_name       = 'number of data points per bin'
                    units           = 'number of data points per bin'
                    data_min        = 0
                    data_max        = 4
                    valid_min       = 0
                    valid_max       = 5
                    FORTRAN_format = 'I2'
```

```matlab
lon = ncread('final_exam2020.nc','longitude');
lat = ncread('final_exam2020.nc','latitude');
% time = ncread("final_exam2020.nc",'time')
depth = ncread("final_exam2020.nc",'depth')
```

```
depth = single

    0
```

```matlab
sst = ncread("final_exam2020.nc",'sst');
bin_count = ncread("final_exam2020.nc",'bin_count');

sst(sst >= 327) = nan;

% m_proj('Mercator','lon',[0 360],'lat',[-90,90]);
% m_coast('patch',[.3 .3 .3]);
% m_grid;
[xlat,ylon] = meshgrid(lat,lon);
pcolor(ylon,xlat,sst);shading flat;axis('image');
```