Read the contents of “cars.csv” into a MATLAB TABLE.

```
CarsData = readtable('cars.csv');
```

Display all the variable names in **CarsData** Table.

```
CarsData.Properties.VariableNames
```

```
ans = 1×9 cell
'Car'        'MPG'        'Cylinders'  'Displacement''Horsepower' 'Weight'     'Acceleration''Model'      'Or
```

List all the Car names in an alphabetical order.

```
sort(CarsData.Car)
```

```
ans = 406×1 cell
'AMC Ambassador Brougham'
'AMC Ambassador DPL'
'AMC Ambassador SST'
'AMC Concord'
'AMC Concord'
'AMC Concord DL'
'AMC Concord DL 6'
'AMC Concord d/l'
'AMC Gremlin'
'AMC Gremlin'
```

Find the Car Name that gives highest MPG (Miles-Per-Gallon)

```
[maxMPG indx] = max(CarsData.MPG);
CarsData.Car(indx)
```

```
ans = 1×1 cell array
    {'Mazda GLC'}
```

```
CarsData.MPG(indx)
```

```
ans = 46.6000
```

What is the average MPG of all Cars?

```
avMPG = mean(CarsData.MPG)
```

```
avMPG = 23.0512
```

List all the Car names that have MPG less than the average MPG of all Cars.

```
[row col]=find( CarsData.MPG < avMPG);
CarsData.Car(row)
```

```
ans = 215×1 cell
'Chevrolet Chevelle Malibu'
'Buick Skylark 320'
'Plymouth Satellite'
'AMC Rebel SST'
'Ford Torino'
'Ford Galaxie 500'
'Chevrolet Impala'
'Plymouth Fury iii'
'Pontiac Catalina'
'AMC Ambassador DPL'
```

List all the Cars with model number greater than 80 and manufactured by Japan

```
[row col]=find( CarsData.Model > 80 & CarsData.Origin == "Japan");
CarsData.Car(row)
```

```
ans = 21×1 cell
'Toyota Starlet'
```

```
'Honda Civic 1300'
'Subaru'
'Datsun 210 MPG'
'Toyota Tercel'
'Mazda GLC 4'
'Honda Prelude'
'Toyota Corolla'
```

List all the countries of origin who have manufactured cars with 6 cylinders.

```
[row col]=find( CarsData.Cylinders == 6);
C = CarsData.Origin(row)
```

```
C = 84×1 cell
'US'
'US'
'US'
'US'
'US'
'US'
'US'
'US'
'US'
'US'
```

```
C = unique(C) % returns only unique values
```

```
C = 3×1 cell
'Europe'
'Japan'
'US'
```

Count the number of cars manufactured by each country between the years 72 and 76 with both years included.

```
[row col]=find( CarsData.Model >= 72 & CarsData.Model <= 76)
```

```
row = 159×1
    6!
    6(
    6:
    6!
    6!
    7(
    7:
    7:
    7:
    7‹

col = 159×1
     1
     1
     1
     1
     1
     1
     1
     1
     1
     1
```

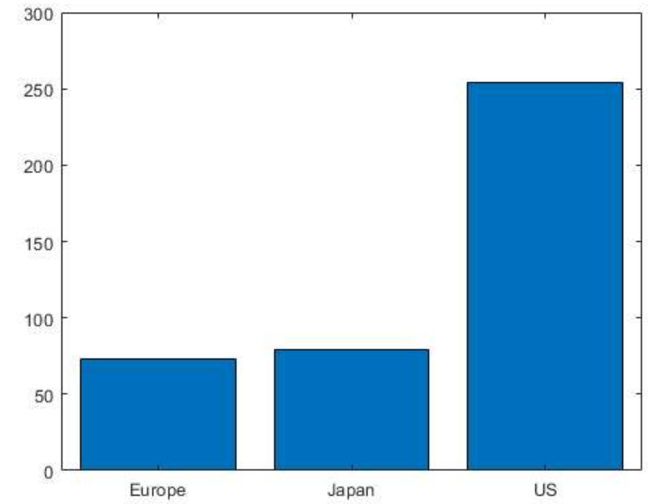
```
[GC,GR] = groupcounts(CarsData.Origin(row))
```

```
GC = 3×1
    3:
    2:
   10‹
GR = 3×1 cell
'Europe'
'Japan'
'US'
```

Plot a bar chart showing the number of cars manufactured by different countries.

```
[GC] = groupcounts(CarsData,"Origin");

bar(categorical(GC.Origin),GC.GroupCount) % see help for categorical
```

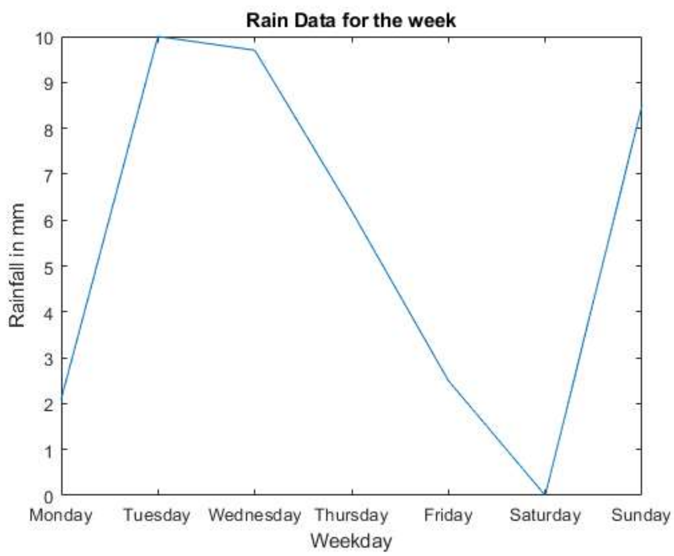


Find all cars manufactured by US in the year 1978 and **write** the all information related to them into a CSV file titled “**US_cars.csv**”.

```
[row col]=find( CarsData.Model == 78 & CarsData.Origin == "US");
T=CarsData(row,[1:end]);
writetable(T,"US_cars.csv");
```

Given the following rain data for a given Week (Monday to Sunday): Plot these values

```
days = {'Monday','Tuesday','Wednesday','Thursday','Friday','Saturday','Sunday'};
rain_data = [2.1 10 9.7 6.2 2.5 0 8.5];
plot(rain_data);
set(gca,'xticklabel',days.');
title('Rain Data for the week');
xlabel('Weekday');
ylabel('Rainfall in mm');
```



Plotting of dynamic system

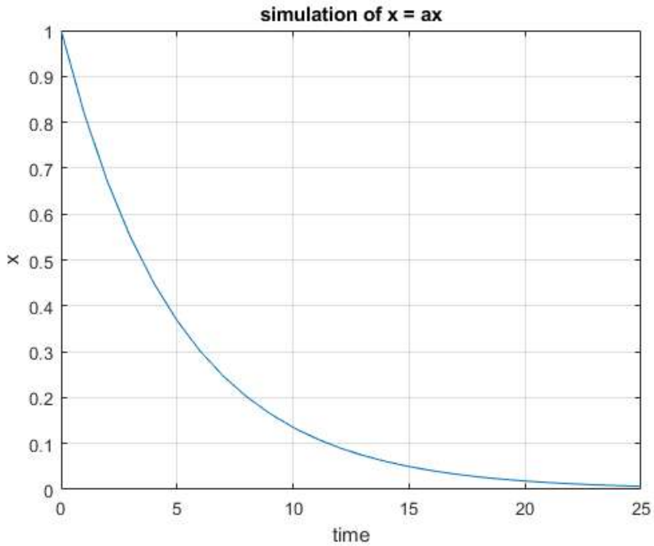
```
%Define Variabes
T=5;
a=-1/T; %Start Condition, etc
x0=1;

t=[0:1:25] %Define the function
```

```
t = 1×26
     0     1     2     3     4     5     6     7     8     9    10    11    12    13    14    15    16    17
```

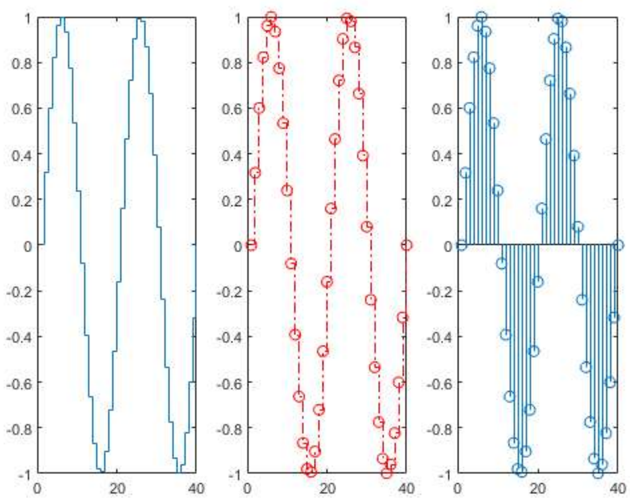
```
x=exp(a*t)*x0;
%Plotting
plot(t,x);
grid
```

```
title('simulation of x = ax');
xlabel('time');
ylabel('x');
```



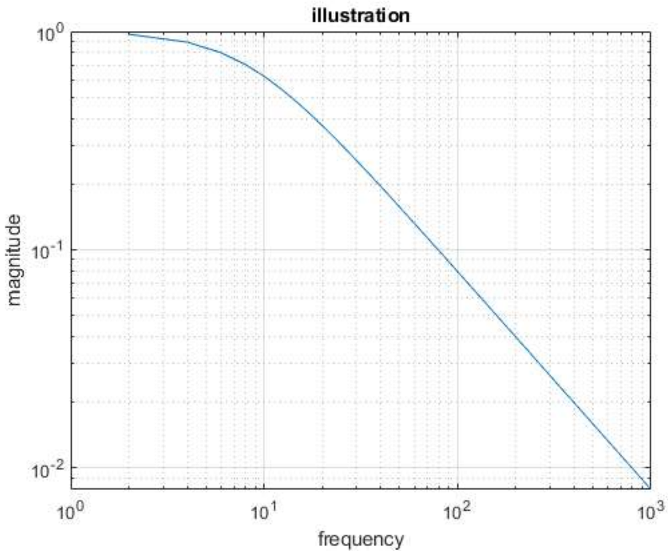
Create a stairstep plot of sine evaluated at 40 equally spaced values between 0 and 4π.

```
subplot(1,3,1);
X = linspace(0,4*pi,40);
Y = sin(X);
stairs(Y);
subplot(1,3,2);%Plot the same stairstep plot setting the line style to a dot-dashed line, the marker symbol to circles, and the color to r
stairs(Y, '-.or');
subplot(1,3,3);
stem(Y);%Also plot a stem graph of the same data.
```



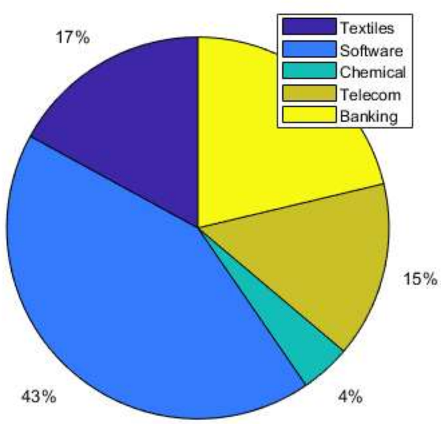
Plot magnitude versus frequency on log-log scale for the transfer function G(s)= 1/(1+0.02s) , where s=jw=j2πf and f is the frequency

```
figure;
frequency = 0: 2:1000;
g= 1./(1+j*2*pi*frequency*0.02);
mag=abs(g);
loglog(frequency,mag)
grid on
xlabel('frequency')
ylabel('magnitude')
title('illustration')
```



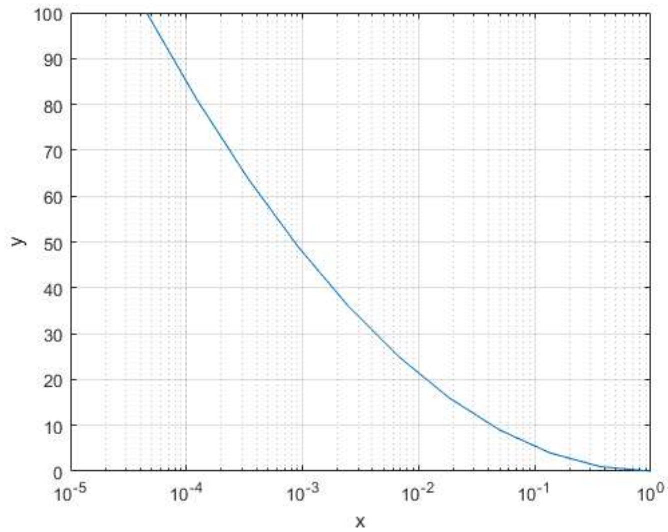
Illustrate the use of pie function to show the concentration of different industries in the region as per the following data. Include legends.

```
labels = {'Textiles','Software','Chemical','Telecom','Banking'};
data = [8 20 2 7 10];
pie(data);
legend(labels);
```



Plot function x= e-a, y = a2 where 0<= a <=10, using semilogx function (Use semilogx(x,y))

```
a=0:1:10;
y=a.*a;
x=exp(-a);
semilogx(x,y)
grid on;
xlabel('x');
ylabel('y');
```



Plot power versus time for 0<t<8 sec, with power on the log scale and time in the linear scale for a motor whose performance equations

```
t=0:1:20;
speed_w=190*(1-exp(-0.15*t));
torque_T= 8*exp(-0.15*t);
Power = speed_w.*torque_T;
semilogy(t,Power);
grid on;
ylabel('Power');
xlabel('time');
```