
MATH2070 Computer Project

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The codes below are just some examples for importing data and exploratory data analysis. Hope they can help you to write your own codes. If you don't know a function, in console window, type the function's name to get information.

Organise Project Fold

```
%Create a folder named MATH2070 (or MATH2090), if you have not done so yet.
% In MATH2070, create another folder named as Computer Project
% Save data (csv file) and OFM project 2019 (pdf file) into the folder.
```

Start MATLAB

```
%to find out your current working directory by typing pwd in console window
% >> pwd
%>> 'D:\Usyd\2019\S2\MATH2070\Computer Project'
%path of Wen's working directory.

% If your working directory is not the one data is saved,
% in console window typing
%>> cd 'project fold path'
% Check if the directory has been changed:
%>> pwd
```

Import Data

Import data as table, matrix, or vectors.

```
%Import as Table: data object takes more memory, each column has a name.
%Date will be imported.
%If imported data as Table, name the data as Data_Tbl, say
%Import as matrix, less memory, no names for columns
%Date will not be imported
%If imported as matrix, name the data as data_mt, say

%If imported as vectors, MATLAB will create name for each vector
```

```
size(Data_Tbl)%1698 rows, 33 columns
%Get variable names
VarNames=Data_Tbl.Properties.VariableNames;
VarNames

%delete columns 1 and 10 from matrix,
mydata=data_mt;
mydata(:, [1 10])=[];
%delete column from a table:
myTbl=Data_Tbl;
myTbl=removevars(myTbl, 'DowInc');
```

Create Returns

```
data_ln=log(mydata);
ret_mt=diff(data_ln);
clear data_ln;
%Save all objects
save Project
%A MATLAB data structure named Project.mat will appear in your fold.
%To open this structure,
load Project.mat
```

Create Time Series Plots

```
ts1 = timeseries(mydata(:, 1),1:1698); %convert a column of a matrix
    into a time series
ts1.TimeInfo.StartDate = '01-Jan-2013';%Set starting date
ts1.Time = ts1.Time - ts1.Time(1);      % Express time relative to the
    start date.
ts1.Name = 'Stock xx';
ts1.TimeInfo.Units = 'days';
ts1.TimeInfo.Format = 'mmm/yyyy';

figure
plot(ts1)
title('Price of StockXX')
xlabel('MM/YYYY')
ylabel('US$')
%Try other stocks

%Plot returns

%convert a column of a matrix into a time series
ts.2TimeInfo.StartDate = '01-Jan-2013';%Set starting date
ts2.Time = ts2.Time - ts2.Time(1);      % Express time relative to the
    start date.
ts2.Name = 'Stock xx';
ts2.TimeInfo.Units = 'days';
ts2.TimeInfo.Format = 'mmm/yyyy';

figure
```

```

plot(ts2)
title('Return of Stock XX')
xlabel('MM/YYYY')
ylabel('%')

%Get minimum returns and dates
[retmin, min_ind]=min(ret_mt);
myName=VarNames;
myName([1 10])=[];
ret_min=[myName', retmin', Dates(min_ind)];

```

Get Correlation Coefficient Matrix (plots)

```

ret_corr=corr(ret_mt);
%or
%rr=corrplot(ret_mt);

%Convert matrix to table:
ret_corr_Tbl=array2table(ret_corr, 'VariableNames',myName, 'RowName',
myName);
%Export data
writetable(ret_corr_Tbl , 'CorrelationMatrix.xlsx','Sheet',1,'Range','A1', 'Writer')
%Get minimum corr
[corr_min1, minind1]=min(ret_corr);
[corr_min, corr_minind]=min(min(ret_mt));
[corr1, ind1]=find(ret_corr==corr_min)
corr_min1(corr_minind)
x=ret_corr;
[mm,ii]=min(x(:))
[I_r I_c]=ind2sub(size(x),ii)
[myName(I_r) myName(I_c) x(I_r, I_c)]

%Get max corrret_corr
dum=ret_corr;
for i = 1:size(ret_corr, 1)
    dum(i,i)=0
end;

[MM,JJ]=max(dum(:))
[J_r J_c]=ind2sub(size(dum),JJ)
[myName(J_r) myName(J_c) dum(J_r, J_c)]

%Scatter plots
figure
subplot(2,1,1)
scatter(ret_mt(:, J_r), ret_mt(:,J_c))
h=lsline;
h.Color='r';
h.LineStyle='--';
subplot(2,1,2)
scatter(ret_mt(:, I_r), ret_mt(:,I_c))
h=lsline;
h.Color='g';

```

```
h.LineStyle='--';
```

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