Homework1- Wei Ye

# Question 1

A1=[1 2 3;4 5 6;7 8 9;10 11 12]

%Construct the following matrices based on A1.

a=[A1(1,1:2);A1(2,1:2)]

b=[A1(1,1) A1(4,3);A1(2,1) A1(3,3);A1(3,1) A1(2,3);A1(4,1) A1(1,3)]

c=[A1(1,1) A1(1,3);A1(3,1) A1(3,3)]

d=[A1(:,1)';A1(:,2)';A1(:,3)']

e=[A1(4,:);A1(3,:);A1(2,:);A1(1,:)]

# Question 2

A2=[13 14 15;16 17 18;19 20 21;22 23 24]

M(:,:,1)=A1

M(:,:,2)=A2

M1=[A2(:,1) A2(:,2)]

M2=[M(1,:,1);M(1,:,2)]

M3=[M(:,3,2) M(:,1,1)]

M4(:,:,1)=M(:,3,1);

M4(:,:,2)=M(:,1,2);

M4

# Q3

x1=[1:2:100]

# Q4

x2=[linspace(0,100,300)]

# Q5

x3=x1(:,20:35)

# Q6

x4=x1(1,2:2:10)

# Q7

y1=cos(x1);

y2=sin(x1);

plot(x1,y1,'b')

title("Question#7 figure")

xlabel("x1");

text(10,0.81,"y1")

hold on

plot(x1,y2,"r")

text(12,-0.85,"y2")

hold off

# Q8

y3=2\*sin(x2).\*cos(x2);

y4=sin(2\*x2);

subplot(2,1,1)

plot(x2,y3);

title("y3 figure")

subplot(2,1,2)

plot(x2,y4)

title("y4 figure")

# Q9

products=[1 2 3]%products within one years

cost=[1 2 3]%cost for goods

price=[2 3 4]%price

profits=products.\*price'-products.\*cost'%profits

%prices and quantities are positively correlated with profits.

close all hidden;

axes;

# Q10

x=-3:0.1:3;

n1=randn(5000,1);

n2=randn(10000,1);

n3=randn(100000,1);

n4=randn(500000,1);

subplot(4,1,1)

hist(n1,x);

title("5000 times")

subplot(4,1,2)

hist(n2,x)

title('10000 times')

subplot(4,1,3)

hist(n3,x)

title("100000 times")

subplot(4,1,4)

hist(n4,x)

title("500000 times")

# Q11

t=1:pi/50:10\*pi;

x=sin(t);

y=cos(t);

z=t;

figure;

plot3(x,y,z)

# Q12

cashflow=[-15000,5000,2500,5700,2500,6000];

irr1=irr(cashflow)

npv=pvvar(cashflow,0.05)

Do this reject, because irr is way higher than opportunity cost rate.

# Q13

irr1<15%, don't do the project.

# Q14

When the rate is equal to the second best rate, in this case, the investors make no difference between different project.

# Q15

project1=[-1000,800,950,1500,2000];

project2=[-1000,1500,1200,500,400];

npv\_1=pvvar(project1,0.05)

npv\_2=pvvar(project2,0.05)

irr\_1=irr(project1)

irr\_2=irr(project2)

I prefer project2, even though it has lower npv, we care about irr, which is higher than project1. Therefore, project 1 is picked.

# Q16

annual\_rate=0.05;

Loan=500000;

NumPeriods=12\*30;

monthly\_rate=(1+annual\_rate)^(1/12)-1;

[Principal,Interest,Balance,Payment]=amortize(monthly\_rate,NumPeriods,Loan)

payment\_vector=repmat(Payment,NumPeriods,1);

amor\_table=[Balance',Interest',Principal',payment\_vector]

plot(Balance,'b'), hold('on')

plot(cumsum(Principal),'--k')

plot(cumsum(Interest),':r')

xlabel('Payment Month')

ylabel('Dollars')

grid('on')

title('Outstanding Balance, Cumulative Principal & Interest')

legend('Outstanding Balance', 'Cumulative Principal', 'Cumulative Interest')

hold off

# Q17

load ibm.dat;

[ro, co] = size(ibm);

subplot(4,1,1);

highlow(ibm(ro-100:ro,2),ibm(ro-100:ro,3),ibm(ro-100:ro,4),'b')

title('highlow figure')

subplot(4,1,2);

bar(ibm(ro-100:ro,4))

title('bar plot')

subplot(4,1,3);

nbins=20

histogram(ibm(ro-100:ro,4),nbins)

title('histogram figure')

subplot(4,1,4);

bolling(ibm(ro-100:ro,4), 30, 0)

title('bollinger bands')