```matlab
%quiz 1 ex 1
function [ m ] = exercise1_quiz1( v )
n=length(v);
m=zeros(n);
for i=1:n
    for j=1:i
        m(i,j)=v(j-i+n)/2^(i-j+1);
    end
end
end
%quiz 1 ex 2
function output=quiz1_ex2(n)
if n==1
    output=3;
elseif n==0
    output=2;
else
temp=quiz1_ex2(n-1);
output=(1-temp)*temp+quiz1_ex2(n-2);
end
```

```matlab
end
%bonus: golden ratio^n

%quiz 2a ex 1a
function output=quiz2a_ex1a(n)
output=0;
for i=3:n+1
    for j=i-1:-1:1
        output=output+i*j;
    end
end
end

%quiz 2a ex 1b
function quiz2a_ex1b() %this title is just
for clarity
x=(1e3:1:1e3+10)';
y=zeros(length(x),1);
for i=1:length(x)
    y(i)=log(quiz2a_ex1a(x(i)));
end
x=log(x);
```

```matlab
coefff=pinv([ones(length(x),1),x])*y;
plot(x,y,'o',x,coefff(1)+coefff(2)*x,'r');
coefff
end

%bonus:the slope is four

%quiz 2a ex 2
function quiz2a_ex2() %this title is just for
clarity
A=@(x) [1 2 3;3 x 4;1 2 5];
x=-10:10;
for i=1:length(x)
    y(i)=min(eig(A(x(i))));
end
plot(x,y);
end


%quiz 2a ex 3
function y=quiz2a_ex3(p)
f=@(x) (x'*x+x(1)*p)/(1+
```

```matlab
(x(1)+2*x(2))^2+(x(1)-x(2))^2)^.5;
y=fminsearch(f,[0;0]);
end


%quiz 2b ex 1
function [der,derder]=quiz2b_ex1(h,a,b,v)
n=length(v);
der=-3*v(1:n-2)+4*v(2:n-1)-v(3:n);
der=der/2/h;
derder=2*v(1:n-3)-5*v(2:n-2)+4*v(3:n-1)-v(4:n);
derder=derder/h^2;
x=a:h:b;
plot(x,v,x(1:n-2),der,x(1:n-3),derder);
title('numerical deriviative');
legend('function','first deriviative','second deriviative');
xlabel('x axis');
ylabel('y axis');
end
```

```matlab
%bonus h^2


%quiz 2b ex 2
function y=quiz2b_ex2(A,n)
y=zeros(length(A));
for i=0:n
   y=y+A^i/factorial(i);
end
end


%quiz 2b ex 4
function [a,b]=quiz2b_ex3(A)
[~,my_index]=min(abs(A(:)));
[a,b]=ind2sub(size(A),my_index);
a
b
end
```