GW 1

```
img = imread('image.jpg');
image(img);

M = [0.13 0.08; 0.17 0.11];
X = inv(eye(2)-M)
A = X * [60; 90]
A - M * [60; 90]
X(:,1)*60+X(:,2)*90


format short
base = eye(2)

for i=1:100
    prev = base
    base = eye(2);
    for j=1:i
        base = base + M^j;
    end
    if base == prev
        i
        break
    end
end


X =

   1.169975023005127   0.105166294202708
   0.223478375180755   1.143683449454450


A =

   1.0e+02 *

   0.796634678585513
   1.163402129617458


ans =

  64.663467858551329
  96.240212961745755


ans =

   1.0e+02 *
```

```
   0.796634678585513
   1.163402129617458


base =

     1     0
     0     1


prev =

     1     0
     0     1


prev =

    1.1300    0.0800
    0.1700    1.1100


prev =

    1.1605    0.0992
    0.2108    1.1357


prev =

    1.1677    0.1038
    0.2205    1.1418


prev =

    1.1694    0.1048
    0.2228    1.1432


prev =

    1.1698    0.1051
    0.2233    1.1436


prev =

    1.1699    0.1051
    0.2234    1.1437


prev =
```

```
    1.1700    0.1052
    0.2235    1.1437


prev =

    1.1700    0.1052
    0.2235    1.1437


prev =

    1.1700    0.1052
    0.2235    1.1437


prev =

    1.1700    0.1052
    0.2235    1.1437


prev =

    1.1700    0.1052
    0.2235    1.1437


prev =

    1.1700    0.1052
    0.2235    1.1437


prev =

    1.1700    0.1052
    0.2235    1.1437


prev =

    1.1700    0.1052
    0.2235    1.1437


prev =

    1.1700    0.1052
    0.2235    1.1437


prev =
```

```
    1.1700    0.1052
    0.2235    1.1437


prev =

    1.1700    0.1052
    0.2235    1.1437


prev =

    1.1700    0.1052
    0.2235    1.1437


prev =

    1.1700    0.1052
    0.2235    1.1437


prev =

    1.1700    0.1052
    0.2235    1.1437


prev =

    1.1700    0.1052
    0.2235    1.1437


prev =

    1.1700    0.1052
    0.2235    1.1437


prev =

    1.1700    0.1052
    0.2235    1.1437


prev =

    1.1700    0.1052
    0.2235    1.1437


prev =
```

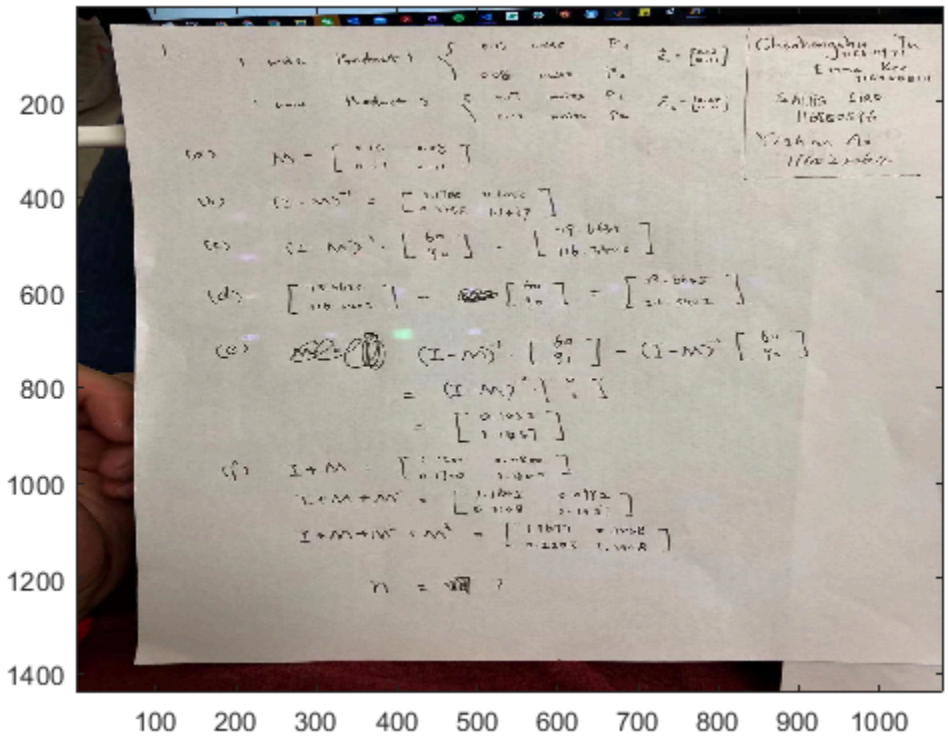
```
    1.1700    0.1052
    0.2235    1.1437


prev =

    1.1700    0.1052
    0.2235    1.1437


i =

    27
```



Question 2 a

```
format long
M =
 [.1588 .0064 .0025 .0304 .0014 .0083 .1594 ; .0057 .2645 .0436 .0099 .0083 .0201
d = [74000;56000;10500;25000;17500;196000;5000];
X = inv(eye(7)-M);
a = X*d
% b
b = 1-d(6)/a(6)
c = 1000*X(:,5)
% c
```

```
v = ones([1,7])
d = v*M

% d
[sb, arg] = max(sum(X, 1))
X
% e
e = X(:, arg)
```

```
a =

   1.0e+05 *

   0.995756533976470
   0.977030228634894
   0.512305231663827
   1.315699219287209
   0.494884913723588
   3.295544525699933
   0.138353357150127


b =

   0.405257618364686


c =

   1.0e+03 *

   0.013546485212513
   0.040363653232193
   0.050773944523776
   0.094834965021666
   1.539277107356803
   0.384173898571207
   0.017461900085769


v =

     1     1     1     1     1     1     1


d =

  Columns 1 through 3

   0.655000000000000   0.588800000000000   0.603800000000000

  Columns 4 through 6
```

```
   0.583100000000000   0.564100000000000   0.357400000000000

  Column 7

   0.929300000000000


sb =

   2.955187838630073


arg =

     7


X =

  Columns 1 through 3

   1.221191753555747   0.027085623175448   0.022568490248364
   0.043242744848991   1.404554483517596   0.124384837174759
   0.080557435159553   0.338748925148140   1.592744644423423
   0.673243521861050   0.190454965812457   0.176276732738394
   0.063578099752589   0.053129342673542   0.100976557331124
   0.340946692229654   0.271064979128422   0.295271207849298
   0.021348092763028   0.030328443165597   0.039245662153616

  Columns 4 through 6

   0.067700142818872   0.013546485212513   0.022655055661307
   0.046583557306531   0.040363653232193   0.051629839607783
   0.055505503114316   0.050773944523776   0.032625241637399
   1.644808272004524   0.094834965021666   0.126639489887716
   0.089717291399437   1.539277107356803   0.057514985014517
   0.325294666070766   0.384173898571207   1.367363801199788
   0.023116312480573   0.017461900085769   0.021116422353471

  Column 7

   0.216748323556360
   0.510313289998327
   0.180957084375943
   0.326471765153562
   0.058999244479360
   0.637139183893196
   1.024558947173324


e =

   0.216748323556360
   0.510313289998327
```

```
0.180957084375943
0.326471765153562
0.058999244479360
0.637139183893196
1.024558947173324
```

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