ICP2021 Assessed Lab 1 report

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Question 1.

```
A = ones(4);
B = ones(4);

C = A * B

D = A .* B %.* is Hadamard product. element wise multiplication of A and B
```

```
C =

     4     4     4     4
     4     4     4     4
     4     4     4     4
     4     4     4     4


D =

     1     1     1     1
     1     1     1     1
     1     1     1     1
     1     1     1     1
```

Question 2.

```
v = reshape(((4:-1:1)* 823543), 4, 1)

v =

     3294172
     2470629
     1647086
      823543
```

Question 3.

```
E = reshape((200:-2:102), 10, 5)

E =

   200   180   160   140   120
   198   178   158   138   118
   196   176   156   136   116
   194   174   154   134   114
   192   172   152   132   112
   190   170   150   130   110
   188   168   148   128   108
   186   166   146   126   106
   184   164   144   124   104
   182   162   142   122   102
```

Question 4.

```
F = [1.0000; 0.8889; 0.7778; 0.6667; 0.5556; 0.4444; 0.3333; 0.2222; 0.1111; 0];
G = repmat(F, 1, 3)
```

```
G =

    1.0000    1.0000    1.0000
    0.8889    0.8889    0.8889
    0.7778    0.7778    0.7778
    0.6667    0.6667    0.6667
    0.5556    0.5556    0.5556
    0.4444    0.4444    0.4444
    0.3333    0.3333    0.3333
    0.2222    0.2222    0.2222
    0.1111    0.1111    0.1111
         0         0         0
```

Question 5.

```
a = flipud(eye(4));  % flipud() - flips matrix vertically
b = eye(4)*2;
c = flipud(eye(4)*3);
d = ones(4,12)* 8 ;
e = eye(4);
f = flipud(eye(4)*2);
g = eye(4)*3;

new_matrix = [a b c; d; e f g]
```

```
new_matrix =

     0     0     0     1     2     0     0     0     0     0     0     3
     0     0     1     0     0     2     0     0     0     0     3     0
     0     1     0     0     0     0     2     0     0     3     0     0
     1     0     0     0     0     0     0     2     3     0     0     0
     8     8     8     8     8     8     8     8     8     8     8     8
     8     8     8     8     8     8     8     8     8     8     8     8
     8     8     8     8     8     8     8     8     8     8     8     8
     8     8     8     8     8     8     8     8     8     8     8     8
     1     0     0     0     0     0     0     2     3     0     0     0
     0     1     0     0     0     0     2     0     0     3     0     0
     0     0     1     0     0     2     0     0     0     0     3     0
     0     0     0     1     2     0     0     0     0     0     0     3
```

```
 flipud(a) - flips matrix a vertically
```

Question 6.

```
brick = ones(3,6);
half_brick = ones(3);
gap = zeros(3,1);
```

```
gap_row = zeros(1,38);

r = [brick gap brick gap brick gap brick gap brick gap half_brick; gap_row;
    half_brick gap brick gap brick gap brick gap brick gap brick; gap_row;
    brick gap brick gap brick gap brick gap brick gap half_brick; gap_row;
    half_brick gap brick gap brick gap brick gap brick gap brick; gap_row;
    brick gap brick gap brick gap brick gap brick gap half_brick; gap_row;
    half_brick gap brick gap brick gap brick gap brick gap brick; gap_row;
    brick gap brick gap brick gap brick gap brick gap half_brick; gap_row;
    half_brick gap brick gap brick gap brick gap brick gap brick; gap_row;
    brick gap brick gap brick gap brick gap brick gap half_brick; gap_row;
    half_brick gap brick gap brick gap brick gap brick gap brick; gap_row;]

imagesc(r)
colormap([0.7 0.7 0.7;0.5 0 0])
axis equal off
```

```
r =

  Columns 1 through 16

     1     1     1     1     1     1     0     1     1     1     1     1     1
0     1     1
     1     1     1     1     1     1     0     1     1     1     1     1     1
0     1     1
     1     1     1     1     1     1     0     1     1     1     1     1     1
0     1     1
     0     0     0     0     0     0     0     0     0     0     0     0     0
0     0     0
     1     1     1     0     1     1     1     1     1     1     0     1     1
1     1     1
     1     1     1     0     1     1     1     1     1     1     0     1     1
1     1     1
     1     1     1     0     1     1     1     1     1     1     0     1     1
1     1     1
     0     0     0     0     0     0     0     0     0     0     0     0     0
0     0     0
     1     1     1     1     1     1     0     1     1     1     1     1     1
0     1     1
     1     1     1     1     1     1     0     1     1     1     1     1     1
0     1     1
     1     1     1     1     1     1     0     1     1     1     1     1     1
0     1     1
     0     0     0     0     0     0     0     0     0     0     0     0     0
0     0     0
     1     1     1     0     1     1     1     1     1     1     0     1     1
1     1     1
     1     1     1     0     1     1     1     1     1     1     0     1     1
1     1     1
     1     1     1     0     1     1     1     1     1     1     0     1     1
1     1     1
     0     0     0     0     0     0     0     0     0     0     0     0     0
0     0     0
     1     1     1     1     1     1     0     1     1     1     1     1     1
0     1     1
     1     1     1     1     1     1     0     1     1     1     1     1     1
0     1     1
     1     1     1     1     1     1     0     1     1     1     1     1     1
0     1     1
     0     0     0     0     0     0     0     0     0     0     0     0     0
0     0     0
```

```
     1     1     1     0     1     1     1     1     1     1     0     1     1
1     1     1
     1     1     1     0     1     1     1     1     1     1     0     1     1
1     1     1
     1     1     1     0     1     1     1     1     1     1     0     1     1
1     1     1
     0     0     0     0     0     0     0     0     0     0     0     0     0
0     0     0
     1     1     1     1     1     1     0     1     1     1     1     1     1
0     1     1
     1     1     1     1     1     1     0     1     1     1     1     1     1
0     1     1
     1     1     1     1     1     1     0     1     1     1     1     1     1
0     1     1
     0     0     0     0     0     0     0     0     0     0     0     0     0
0     0     0
     1     1     1     0     1     1     1     1     1     1     0     1     1
1     1     1
     1     1     1     0     1     1     1     1     1     1     0     1     1
1     1     1
     1     1     1     0     1     1     1     1     1     1     0     1     1
1     1     1
     0     0     0     0     0     0     0     0     0     0     0     0     0
0     0     0
     1     1     1     1     1     1     0     1     1     1     1     1     1
0     1     1
     1     1     1     1     1     1     0     1     1     1     1     1     1
0     1     1
     1     1     1     1     1     1     0     1     1     1     1     1     1
0     1     1
     0     0     0     0     0     0     0     0     0     0     0     0     0
0     0     0
     1     1     1     0     1     1     1     1     1     1     0     1     1
1     1     1
     1     1     1     0     1     1     1     1     1     1     0     1     1
1     1     1
     1     1     1     0     1     1     1     1     1     1     0     1     1
1     1     1
     0     0     0     0     0     0     0     0     0     0     0     0     0
0     0     0

  Columns 17 through 32

     1     1     1     1     0     1     1     1     1     1     1     0     1
1     1     1
     1     1     1     1     0     1     1     1     1     1     1     0     1
1     1     1
     1     1     1     1     0     1     1     1     1     1     1     0     1
1     1     1
     0     0     0     0     0     0     0     0     0     0     0     0     0
0     0     0
     1     0     1     1     1     1     1     1     0     1     1     1     1
1     1     0
     1     0     1     1     1     1     1     1     0     1     1     1     1
1     1     0
     1     0     1     1     1     1     1     1     0     1     1     1     1
1     1     0
     0     0     0     0     0     0     0     0     0     0     0     0     0
0     0     0
     1     1     1     1     0     1     1     1     1     1     1     0     1
1     1     1
```

1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1
1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	0
1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	0
1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1
1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1
1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	0
1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	0
1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1
1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1
1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	0
1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	0
1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1
1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1
1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	0
1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	0
1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	0

```
         0         0         0         0         0         0         0         0         0         0         0         0         0
         0         0         0

  Columns 33 through 38

         1         1         0         1         1         1
         1         1         0         1         1         1
         1         1         0         1         1         1
         0         0         0         0         0         0
         1         1         1         1         1         1
         1         1         1         1         1         1
         1         1         1         1         1         1
         0         0         0         0         0         0
         1         1         0         1         1         1
         1         1         0         1         1         1
         1         1         0         1         1         1
         0         0         0         0         0         0
         1         1         1         1         1         1
         1         1         1         1         1         1
         1         1         1         1         1         1
         0         0         0         0         0         0
         1         1         0         1         1         1
         1         1         0         1         1         1
         1         1         0         1         1         1
         0         0         0         0         0         0
         1         1         1         1         1         1
         1         1         1         1         1         1
         1         1         1         1         1         1
         0         0         0         0         0         0
         1         1         0         1         1         1
         1         1         0         1         1         1
         1         1         0         1         1         1
         0         0         0         0         0         0
         1         1         1         1         1         1
         1         1         1         1         1         1
         1         1         1         1         1         1
         0         0         0         0         0         0
         1         1         0         1         1         1
         1         1         0         1         1         1
         1         1         0         1         1         1
         0         0         0         0         0         0
         1         1         1         1         1         1
         1         1         1         1         1         1
         1         1         1         1         1         1
         0         0         0         0         0         0
```