Pre Lab 1

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# Q1

% a) Double zero matrix

m1 = zeros(5,5,"double")

% b) Double matrix with 0.134

m2 = zeros(5,5,"double")+double(0.134)

% c) Double matrix with random values [-1.5, 3.4]

% Given range [a,b] the formula: m = a + (b-a).\*rand([5,5])

m3 = -1.5 + (3.4 + 1.5).\*rand([5,5],"double")

% d) Make m3 into uint8 with casting.

% All the negative numbers turned to 0. All fractions were rounded to the

% closest integer. Becasue it's unsigned, it did meet our expectations.

m3 = uint8(m3)

% e) Make 5x5 matrix using uint8 in range of [0,250]

A = uint8(250.\*rand([5,5]))

% f)

% All The values above 127 are now 255.

A = A.\*2

% g)

% Find the maximum value in the matrix using find().

v = max(A(:)) % value

[row,column] = find(A == v)

# Q2

% a)

% Create unit matrix I1.

I1=eye(3,4,"double")

% b)

% Create row index matrix I2 and column index matrix I3.

x = 1:4;

y = 1:3;

[I3,I2] = meshgrid(x,y)

% c)

% Transform I3 matrix into a vector.

% The function sets the columns of the

% matrix one after eachother to creare a vector.

I3a = reshape(I3,1,[])

% d)

% We didnt get the same vector. This Vector is like reshape of I2.

% Because we transposed I3 it became I2

% Now it's like the rows are set one after eachother to create a vector.

I3b = reshape(I3.',1,[])

% e)

% the vector I3c is similar to the vector I3a.

% we can say that reshape makes a column vector from the matrix and than

% transpose it.

I3c = I3(:).'

# Q3

% repmat Is copying the matrix 3 times in the x axes and 2 times in the y

% axes.

A1 = repmat(A,3,4)

# Q4

% flipud flips the matrix upside down.

A=flipud(A)

# Q5

% 1st Ex

A1 = [ 1 2 3 4 ]

B1\_pre = padarray(A1,3,9,'pre')

% 2nd Ex

A2 = [ 1 2; 3 4 ]

B2\_post = padarray(A2,[3 2],'replicate','post')

% 1st one with 'post' and 'both'

B1\_post = padarray(A1,3,9,'post')

B1\_both = padarray(A1,3,9,'both')

% 2nd one with 'both' and 'circular'

B2\_both = padarray(A2,[3 2],'circular','both')

% padarray is taking an array and padding it with a given number or a

% series of numbers. It's done with additional collums or rows. There is an

% option to choose where to pad it.

# Q6

% imshow show the matrix as an image where every number in the matrix

% represent a level of gray, the square brackets are the range for the gray level.

% it means that 10 is black and 20 is white.

I = uint8(20.\*rand([3,5]));

imshow(I ,[10 20]);

# Q7

I=imread("logoruppin.jpg");

I1=rgb2gray(I);

imshow(I1);

imshow(I);

# Q8

%In order to use this function we need the path to the file, the file name

%and size for X and Y.

% fread reads binary data from a file in uint8 format.

FilePath = "D:\ImageProc\lab 1";

FileName = "barbara\_gray.raw";

Img1 = ImgLoad(FilePath,FileName,1024,256);

imshow(mat2gray(Img1));

Img2 = ImgLoad(FilePath,FileName,2048,128);

imshow(mat2gray(Img2));

Img3 = ImgLoad(FilePath,FileName,512,512);

imshow(mat2gray(Img3));

% 512X512 is the correct size, no duplications.

# Q9

Bar = imread("Bar.jpg");

BarPicSize = size(Bar);

imshow(Bar);

Ben = imread("Ben.jpg");

BenPicSize = size(Ben);

imshow(Ben);