Name: Bedram Tamang

Roll No: 14

1. Using vectorization and the colon operator, use a single command each to generate:

   i) the first 15 cubes,

   ii) the values sin(nπ/16) for n from 1 to 16

```
for n = 1:15
    n^3
end
```

Calculating the value of sin(nπ/16)

```
for n = 1:6
    A = sin(n*pi/16)
end
```

2. Enter the following matrices:

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 3 & 4 & 5 \end{bmatrix}, \quad B = \begin{bmatrix} -1 & 2 & -1 \\ -3 & -4 & 5 \\ 2 & 3 & -4 \end{bmatrix}, \quad C = \begin{bmatrix} 0 & -2 & 1 \\ -3 & 5 & 2 \\ 1 & 1 & -7 \end{bmatrix}$$

And Calculate:

$$2A - 3B, \quad A^T, \quad AB - BA, \quad BC^{-1}, \quad (AB)^T, \quad B^T A^T, \quad A^2 + B^3$$

Solutions:

```
% Define Variables A, B, C for matrices
A = [1 2 3; 2 3 4; 3 4 5]
B = [-1 2 -1; -3 -4 5; 2 3 -4]
C = [0 -2 1; -3 5 2; 1 1 -7]
```

Calculating 2A - 3B

```
% Calculating 2A - 3B
2*A-3*B
```

Calculating AB - BA

```
% Calculating AB - BA
A*B - B*A
```

```
% Calculating BC^-1
B * inv(C)
```

```
% Transpose of AB
(A*B)'
```

```
% Transponse of B * Transpose of A
B' * A'
```

```
% Square of A + Cube of B
A*A + B*B*B
```

3. Type following commands in MATLAB and see what it gives:

```
w = imread('wombats.tif')
```

Executing the above command loads the images into variables `w`, which is M * N size of array and value of each array item refers to the intensity of that image corresponds to that pixels of image.

```
figure , imshow(w), pixval on
```

the function `pixval on` has been removed in new version.

Instead of running above commands I ran the below commands as follows:

```
figure , imshow(w)
```

Running the above commands show the images with name figure

```
size(w)
```

It returns the size of images which is `434    650    3`.

```
imfinfo('wombats.tif')
```

Above commands returns the details of images.

```
Filename = /home/ellite/Documents/College/Third Sem/Image/Lab/wombats.tif
FileModDate = 10-Sep-2020 22:49:02
FileSize =  1131930
Format = TIFF
FormatVersion =
Width =  650
Height =  434
BitDepth =  8
ColorType = truecolor
DelayTime = 0
DisposalMethod =
LoopCount = 0
ByteOrder = undefined
Gamma = 0
Chromaticities = [](1x0)
Comment =
Quality =  75
Compression = undefined
Colormap = [](0x0)
Orientation =  1
ResolutionUnit = Inch
XResolution =  72.009
YResolution =  72.009
Software =
Make =
Model =
DateTime =
ImageDescription =
Artist =
Copyright =
DigitalCamera =

   scalar structure containing the fields:


GPSInfo =

   scalar structure containing the fields
```

4. Pick a grayscale image, say cameraman.tif or wombats.tif. Using the imwrite function, Write it to files of type JPEG, PNG and BMP. What are the sizes of those files?

```
a = imread('wombats.tif')

imwrite(a,'image.png')
imwrite(a,'image.jpg')
imwrite(a,'image.bmp')
```

The above original image was of size 1.1MB, the converted images was found of sizes:

PNG: 326KB

JPG: 25.9KB

BMP: 847KB