**Matlab Tutorial #2**

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**ECE 595**

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**Question 2:**

Execute the following code and compare the elapsed time differences between the two.

>> tic; for i = 1:10ˆ6; sin(i);end; toc;

>> tic; i=1:10ˆ6; sin(i); toc;

Understand how the for loop can slow down the process by quite a bit. Can you explain why?

**hw2\_q2\_q4.m:**

clear, clc, close all

format short, format compact

%Queston 2

%Measure how slow the for command is using the tic toc timer

%Test 1

fprintf("Question 2: \n");

tic;

for i = 1:10^6;

sin(i);

end;

toc;

%Test 2

tic;

i = 1:10^6;

sin(i);

toc;

**Results**

Question 2:

Elapsed time is 0.412783 seconds.

Elapsed time is 0.249487 seconds.

**Question 3:**

Matrices can be flipped up or down using flipud, left or right using fliplr and rotated by 90 degrees by rot90. Explore them.

**hw2\_q2\_q4.m:**

%Queston 3

%Use the matrix flip commands.

fprintf("\nQuestion 3: \n");

A = [1 2 3; 4 5 6; 7 8 9]

B = flipud(A)

C = fliplr(A)

D = rot90(A)

**Results**

Question 3:

A =

1 2 3

4 5 6

7 8 9

B =

7 8 9

4 5 6

1 2 3

C =

3 2 1

6 5 4

9 8 7

D =

3 6 9

2 5 8

1 4 7

**Question 4:**

Using the colon and dot operators alone, generate the first 15 cubes.

**hw2\_q2\_q4.m:**

%Question 4

%Generate 15 cubes using colon and dot operators

fprintf("\nQuestion 4: \n");

A = (1:15);

B = A .^3;

B = B'

**Results**

Question 4:

B =

1

8

27

64

125

216

343

512

729

1000

1331

1728

2197

2744

3375

**Question 6:**

Write a function issquare that will determine whether a given integer is a square number. (Hint: Use the floor function.)

**issquare.m:**

%this function will prompt the user to enter a number

%and determine if the number is a square number.

function [] = issquare(num)

if sqrt(num) == floor(sqrt(num))

fprintf("%d is a square number.\n", num);

else

fprintf("%d is not a square number.\n", num);

end

**hw2\_q6.m:**

clear, clc, close all

format short, format compact

%Question 6

num = input('Enter a number: ');

issquare(num);

**Results**

Enter a number: 13

13 is not a square number.

Enter a number: 4

4 is a square number.

**Question 8:**

Pick a gray-scale image, say cameraman.tiff or any other file you can get a hold of, and using the imwrite function write it to files of types JPEG, PNG, and GIF. What are the sizes of the files.

**hw2\_q8.m:**

clear, clc, close all

format short, format compact

%Question 8

I = imread('cameraman.tiff');

imwrite(I, 'cameraman.jpeg');

imwrite(I, 'cameraman.png');

imwrite(I, 'cameraman.gif');

**Results**

