

Question 1

Part a

```
image1 = imfinfo("pout.tif");  
image2 = imfinfo("coins.png");  
image3 = imfinfo("cameraman.tif");  
image4 = imfinfo("rice.png");
```

Part b

```
field1 = 'ImageName'; value1 = {image1.Filename, image2.Filename,  
    image3.Filename, image4.Filename};  
field2 = 'Height'; value2 = {image1.Height, image2.Height, image3.Height,  
    image4.Height};  
field3 = 'Width'; value3 = {image1.Width, image2.Width, image3.Width, image4.Width};  
  
s = struct(field1, value1, field2, value2, field3, value3);  
%s(1)  
%s(2)  
%s(3)  
%s(4)
```

Part c

```
save ('s.mat', 's');
```

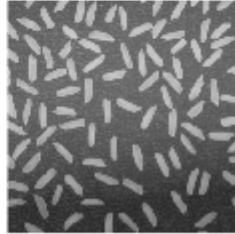
Question 2

Part a

```
load('s.mat');
```

Part b

```
%figure  
%montage({s(1).ImageName,s(2).ImageName,s(3).ImageName,s(4).ImageName},'Size', [2 2])  
  
subplot(2,2,1); imshow(s(1).ImageName)  
subplot(2,2,2); imshow(s(2).ImageName)  
subplot(2,2,3); imshow(s(3).ImageName)  
subplot(2,2,4); imshow(s(4).ImageName)
```



Question 3

Part a

```
picture = imread("pout.tif");  
imshow(picture);
```



Part b

```
picture_double = im2double(picture);  
MinInt = min(picture(:))
```

```
MinInt = uint8
```

```
74
```

```
MaxInt = max(picture(:))
```

```
MaxInt = uint8
```

```
224
```

```
Mean = mean(picture(:))
```

```
Mean = 110.3037
```

```
MinDouble = min(picture_double(:))
```

```
MinDouble = 0.2902
```

```
MaxDouble = max(picture_double(:))
```

```
MaxDouble = 0.8784
```

```
Average = mean(picture_double(:))
```

```
Average = 0.4326
```

Question 4

Part a

```
[File,Path] = uigetfile('*.','Select an image');  
image=imread(strcat(Path,File));  
%imshow(image);
```

Part b

```
UpsideDown = flip(image,1);  
%imshow(UpsideDown);
```

Part c

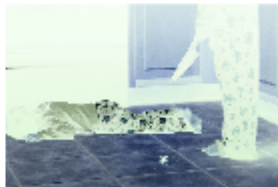
```
LeftRight = flip(image,2);  
%imshow(LeftRight)
```

Part d

```
Negative = 255 - image;  
%imshow(Negative)
```

Part e

```
subplot(2,2,1); imshow(image)
subplot(2,2,2); imshow(UpsideDown)
subplot(2,2,3); imshow(LeftRight)
subplot(2,2,4); imshow(Negative)
```



Question 5

Part a

```
tic
I = imread('coins.png');
[ height width] = size(I);
J = uint8(zeros(size(I)));
for i = 1:height
    for j = 1:width
        J(i,j) = 0.5* I(i,j);
    end
end
imshow(I)
figure, imshow(J)
```



```
toc
```

Elapsed time is 0.933235 seconds.

Yes, the script works as expected.

Part b

No, the code will not work after removing `unit8` because there are other values in the code that are doubles and MATLAB automatically assigns numbers as doubles.

Part c

The main problem of this code is that the creator did not code watching out for doubles and integers and the loop is confusing because there are two for loops. The time for the loop to go through and perform the operations is longer than it needs to be since there are two for loops when there can be one.

Part d

```
tic
I = imread('coins.png');
[height width] = size(I);
I_double = im2double(I);
J = (zeros(size(I_double)));
i=1:height;
for j =1:width
    J(i,j) = 0.5* I_double(i,j);
end
imshow(I)
```



```
figure, imshow(J)
```



```
toc
```

Elapsed time is 0.751724 seconds.

Part e

My code now runs faster than the previous code and all of my values/numbers are of type:double.