CS1112 Summer 2010

Quiz 5

Print Name: _____

Problem 1	10 pts	
Problem 2	10 pts	
Problem 3	10 pts	
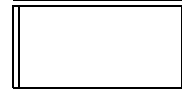
1. (a) Describe in English what the following script displays. Assume that `CornellSnow.jpg` represents a color image and is in the current working directory.

```
A = imread('CornellSnow.jpg');
B = rgb2gray(A);
[m,n] = size(B);
C = zeros(n,m,'uint8');
for i=1:m
    C(:,i) = B(m+1-i,:);
end
imshow(C)
```

1. (b) What is the output if the following script is run?

```
x = uint8(200);
y = uint8(300);
a = (x+y)/2
b = double((x+y)/2)
```

2. Recall that the built in function `strcmp` has the property that `strcmp(s1,s2)` is 1 if `s1` and `s2` are identical strings and 0 otherwise. Assume that `C` is an initialized cell array of strings and that `s` is an initialized string. Complete the `while`-loop condition so that the following fragment is correct:

```
k = 1;

while _____
    k = k+1;
end
if k>length(C)
    disp('The string in s does not occur in C')
end
```

3. Consider the following definitions:

Definition 1. For a given black-and-white image, we say that pixel (i, j) is an *interior pixel* if it is not on the edge of the image.

Definition 2. For a given black-and-white image, we say that pixel (i_1, j_1) is a *neighbor* of pixel (i_2, j_2) if $|i_1 - i_2| + |j_1 - j_2| \leq 1$.

Definition 3. For a given black-and-white image, we say that a pixel is *very bright* if it is an interior pixel and each of its neighbors has a lessor intensity.

Complete the following function so that it performs as specified:

```
    function C = VeryBrightPixels(X)
% X names a black-and-white jpg file in the current directory.
% C is a cell array of length-2 vectors that collectively identify
% all the bright pixels in X. Thus, if the function outputs the cell
% array {[40,300],[200,30],[100,150]}, then pixels (40,300), (200,30),
% and (100,50) are the very bright pixels.

A = imread('X.jpg');
```