Assignment 6: Working with Strings

Name: ____________________________________________________________

Part 1: Design a function to embed a secret message into a picture.

*Your function may be identical to that designed in class, or may be different (improved upon).*

Name: encodePict

Purpose: buries a text message in an image

Parameter(s):

Return value:

Assumptions:

Side effects:

Is your function different from the one designed in class? If so, in what way?
Part 2: Design a function that extracts a secret message buried in a picture.

Name: decodePict

Purpose: extracts a text message that has been buried in an image

Parameter(s):

Return value:

Return value:

Assumptions:

Side effects:

In English, explain how to solve this problem
Extra Credit: Making line drawings.

*Edge detection* is a process where we compare pixels to determine what to put in a corresponding pixel, but we basically only set the pixel to black or white. The idea is to try to draw lines the way an artist might sketch a drawing with lines.

It’s really an amazing feature of our visual systems that we can look at a line drawing of someone and pick out a face or other features. Look at the world around you—there really aren’t sharp lines defining features of the world. There are no clear lines around your nose or eyes, but any child can draw a face with a checkmark for a nose and two circles for eyes and we’ll all recognize it as a face! Typically, we see a line where there is a difference in luminance.

Luminance was discussed in your reading (see Chapter 3), and you used it when converting a pixel to grayscale. Basically, the luminance of a pixel is the average of the colors, i.e., \((\text{red} + \text{green} + \text{blue}) / 3\).

To model this in your function, compare each pixel’s luminance to the pixel below it and to the left of it. If there is a suitable difference in luminance below and to the left, then we make the pixel black. Otherwise we leave the pixel white. (Experimentation found that a threshold value of only 2 worked pretty well.)

Name: *lineDrawing*

Purpose:

Parameter(s):

Return value:

Return value:

Assumptions:

Side effects:

In English, explain how to solve this problem