CS1115 Lab 10 (November 1, 2012)

Completing the lab is very important, but your work is not graded and it is not submitted. If you finish before the hour is over, then you can leave early or you can work on the "Finished Early" problems. If you do not finish the problems before the end of class, then be sure to ask enough questions so that you can complete the exercises in the next day or two on your own.

1 Image File Processing

Download `Cornell_Clock.jpg'` and `UINT8_funnybiz`. Run the latter to acquire intuition about `uint8` arithmetic.

Let `p = [p1 p2 p3]` and `q = [q1 q2 a3]` be `uint8` variables. The *distance* between them is given by $|p_1 - q_1| + |p_2 - q_2| + |p_3 - q_3|$.

Define the `uint8` vector

```
colors = uint8(255* [ 0 0 0; 1 0 0; 0 1 0; 0 0 1; 1 0 1; 1 1 0 ; 0 1 1; 1 1 1])
```

Notice that this encodes the colors `'k'`, `'r'` `'g'` , `'b'`, `'m'`, `'y'`, `'c'`, and `'w'`

Generate an image `Cornell_Artsy_Clock.jpg` from `Cornell_Clock.jpg` by replacing each pixel in the latter with the closest pixel from `colors`.

2 Sound File Processing

Download the file `noCry.wav` from the syllabus page.

(a) Create a file `noCry1.wav` which when played, plays the noCry soundbite, pauses for 1 second, and then plays the noCry soundbite again.

(b) Create a file `noCry2.wav` that plays the noCry soundbite over and over and over again for exactly 30 seconds.

(c) Suppose `[y,r] = wavread('noCry')`. It turns out that `y` has length $4m$ where $m = 19451$. Write a script that plays $y(1 : m)$ at rate r and then plays $y(m + 1 : 2 * m)$ at rate $(1.2)r$ and then plays $y(2 * m + 1 : 3 * m)$ at rate $(1.2)^2 r$ and then plays $y(3 * m + 1 : 4 * m)$ at rate $(1.2)^3 r$. There should be no pause between the four segments.

(d) Can you write a function `FasterAndFaster(F,n,factor)` that plays an "ever faster" version of the `.wav` file named by `F`? It should break the sound vector into n (approximately) equal segments and play the kth segment at rate $(factor)^{k-1} r$ where r is the original sampling rate. (In the preceding example, $n = 4$ and $factor = 1.2$.

Please delete your files from the computer before you leave the lab!