CSC108H Week 9 Lab

For Winter 2012, this lab is optional.

1 Objectives

1. Practice with 2D images
2. Accomplish something really cool!

2 Driver and navigator

Pick which of you will drive first, log in, and start up Wing.

3 Virtual Travelling

You are going to help some CS profs travel the world without leaving home. Here's how to do it:

- Pick a 320x240 picture of a CS prof against a green or grey background, and a 320x240 picture of wilderness. There are several available on the Labs webpage. Also download the starter code.
- Import `media`. Select a picture using `media.choose_file` and `media.load_picture` and then call `media.inspect` on that picture. This will open up a picture tool that you can use to examine colour values and (x, y) coordinates. Where is pixel (0, 0)? What are the coordinates of the bottom-right pixel? What RGB value does pixel (0, 0) have? How about a person's eyes? Skin? Shirt?
- We can start traveling by replacing all the pixels that are part of the grey or green wall — they're all about the same colour — with pixels from another picture. Using the `media.distance` function (get `help` on it!) you can tell how close one colour is to another.
- Each pixel has an (x, y) coordinate. You can get those by calling `media.get_x(pixel)` and `media.get_y(pixel)`. Using `media.get_color`, you can then get the colour value. Once you've got the (x, y) values, you can get the pixel at the same location in the background picture using `media.get_pixel}`, get that pixel's colour, and set the pixel from the person's picture to that colour. Notice that we are using the fact that `Picture`s are mutable to modify the person's picture as opposed to creating a new `Picture`.
- How do you know which colour to compare the pixels with using `media.distance`? Pick a colour from a pixel in the picture; you'll need to experiment. Perhaps the pixel at (0, 0) would work. Maybe (160, 10). And how close should the other pixels be? Maybe `media.distance` should return less than 30? 20? 40? Too small and not enough pixels get replaced. Too large and all of them do.

  Choosing these values is a fun but tricky problem — be sure to ask your TA for help when you get stuck! And you'll never get it quite perfect, although you can come close. (In order to do this fully, you'll need pictures of people against a bright blue or green background.)
- Once you've written your travelling code, add a name tag to your instructor's shirt using `media.add_text` (look it up using `help()`).
- Now use the shape functions from `media` (`add_line`, `add_oval`, `add_oval_filled`, `add_rect`, `add_rect_filled`, ...) to draw glasses, a moustache or something else on your picture. Have fun with this at our expense!