This assignment is intended to get you familiar with scanning and with file formats.

First, go find two images. One of them should be a photograph (a real photograph – borrow one if you have to), and the other should be from a magazine or book.

1) Scan both of your images into a spatial resolution of **approximately** 500x500. Go no larger than 800 pixels and no smaller than 300 pixels in any dimension. Scan them at 8 bits/pixel, grayscale (might be called "256 shades of gray" on the scanner). If you are scanning a typical 4x6 photo, this would mean scanning at about 100 dpi. **REMEMBER**: set the **type** and **resolution** with the scanner software. The way to see your image's spatial resolution is to check the width and height readouts. In other words, **don't set the spatial resolution explicitly** – only change the dpi.

The most common mistake in this assignment is scanning your image at TOO HIGH a spatial resolution! Be sure to check the width and height readouts in the scanner Settings window BEFORE scanning!

2) Save your photograph image 4 times using 4 different *file formats.* In Photoshop, this can be done with **File->Save As**, where you will be given a choice of different formats to use. The formats you need to save as are TIFF (with compression, Macintosh format), JPEG (with maximum quality), JPEG (with minimum quality), and the native file format of your image editing system ("Photoshop" if you're using Photoshop).

Save the files onto your ZIP disk with the same *base name*, i.e., "assignment1photo" but use different *extensions*. Typical extensions for the formats given above are:

format	extension	example
TIFF:	.tif	assignment1photo.tif
JPEG:	.jpg	assignment1photo.jpg
Photoshop:	.psd	assignment1photo.psd

Since you're saving two versions of JPEG images, you will want to do something to differentiate them on disk (for example, "assignment1.min.jpg" and "assignment1.max.jpg").

3) On a sheet of paper, write down the spatial resolution of the photograph image. Calculate the **total number of pixels** that make it up and write that down too. Then, look at the sizes of the 4 different versions that you have on disk. With a calculator, compute the **effective bit depth** of each version. This is the average number of bytes per pixel based on the image's size on disk. You simply divide the number of bytes the image takes on disk by the total number of pixels. List the 5 formats in descending order with their effective bit depth. Please convert bit depths to **bits**, so your answer can be compared to the actual bit depth of 8 bits per pixel

(over)

4) Load each of the 5 versions of the photograph image separately into Photoshop and see if you can identify any visual differences between them. Can you? Which formats look different, and in what ways do they look different? Note these differences on the sheet.

5) Finally, hand in the TIFF version of your **photograph** image. Here's how:

• In the classroom, go to the **Course Storage** menu under the Apple menu on any of the machines. Log in as **cs116** with password **cs116**. This will mount the shared disk called **Course Storage** onto your desktop.
• (If you want to hand in the image from a remote Mac on campus, you will find course storage disk under hampnet2, ASH e-class server. Log in the same way.)
• Inside the **cperry** folder, find the **cs116** subfolder. Inside that there should be a **hand-ins** folder.
• The hand-ins folder is **write only**, which means that you cannot open it to see what's inside. But you can still copy files into the folder.
• RENAME your file so I know it's yours. If I were handing in the assignment I would name my file **ChrisPerryFFA.tif** or ChrisPerryA01.tif.
• Option-drag the TIFF file from your zip disk to the hand-ins folder (meaning, press the option key, and while holding it, click and drag the file and release the mouse button over the hand-ins folder).
• When you're done, drag the Course Storage disk into the trash on your local machine. This frees up the server for others to use.