Supplemental information for HW#1, Problem #2:

Galaxy Information: The galaxies were observed with the Lowell Observatory 1.1m telescope and are part of the Frei Galaxy Catalog (www.zsolt-frei.net/catalog.htm). The images are taken with the *R* band which is centered around 6500 angstroms. The images are 313 x 313 pixels and the pixel scale is 1.35 arcsec/pixel. For NGC 2775, one count corresponds to a surface brightness of 26.05 mag/square arcsec. For NGC 4030 , one count is 27.50 mag/square arcsec.

Producing and fitting the galaxy light profile: One way to do this project is to use the ELLIPSE task in IRAF. This task can be found by loading the STSDAS, ANALYSIS and ISOPHOTE packages once in the IRAF environment. ELLIPSE will fit concentric isophotes to the galaxy image and produce a table containing the semi-major axis (in pixels), the average counts at that radius, position angle, ellipticity, etc. You need only use the semi-major axis and counts columns to complete this exercise. ELLIPSE produces a table (*.tab) with these results. The table columns of interest can be dumped to a normal ascii file using the TDUMP task. The columns headings for the columns you will dump are SMA (semi-major axis) and INTENS (intensity/flux).

At this point, you can plot the profile using your choice of plotting software. The next step is to determine the sky level and subtract this from your flux values. Next, determine the regions of the profile that constitute the "bulge" and the "disk" – you might find looking at the image to be the most helpful with this part. Then attempt to fit the de Vaucouleurs profile to the bulge portion and the exponential profile to the disk portion. One way to do this is using the CURFIT task in IRAF. This will allow you to fit a simple polynomial to the profile. The profile equations you are fitting can be converted to simpler equations (i.e. $mu = c1 + c2*R^{1/4}$) and the columns manipulated (flux to surface brightness and R to $R^{1/4}$) to fit a simple linear equation. Once you have fit one component, subtract it from the profile and fit the remaining component.