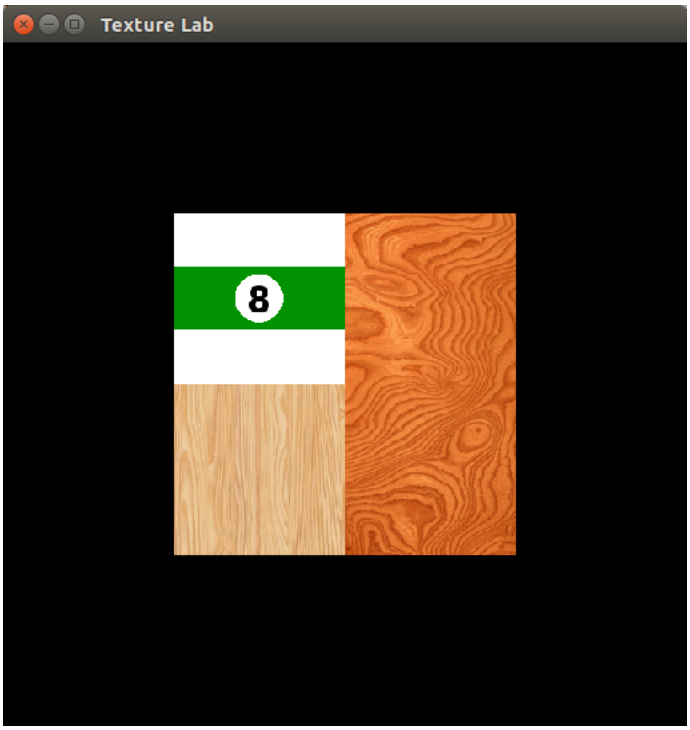
Lab 5: Texture Mapping

Submission timestamps will be checked and enforced strictly by the CourseWeb; **late submissions will not be accepted**. Check the due date of this lab on the CourseWeb. Remember that, per the course syllabus, if you are not marked by your recitation instructor as having attended a recitation, your score will be cut in half.

For this lab, you are going to modify given source codes to match your programming environment. The give programs demonstrate how to perform a very simple texture mapping onto a basic square. In this lab, you also have to create your own texture from an image by converting it into a raw data using GIMP.

Perform the Texture Mapping

The main program for this lab is `textureLab.c`. This program will open a raw image file named `texture01.raw`. So, make sure you have this file in the directory that your IDE environment can open it. Typically in the same directory as `vshader.glsl` and `fshader.glsl`. The vertex shader program and the fragment shader program also provided. So, make sure you can compile and run the application and you should see the following:



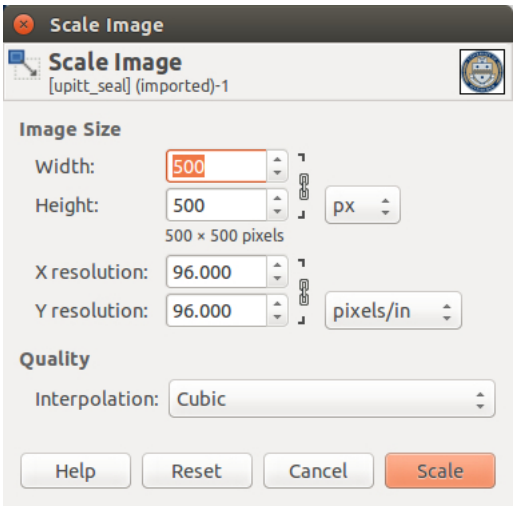
GIMP

GIMP (GNU Image Manipulation Program) can be found at `www.gimp.org`. It is a free and open source image editor. It is very powerful image editor. So, it is quite hard to use. However, we are going to use a very simple feature of this to help us generate a raw image suitable for us to load into the graphic pipeline. So, first download and install GIMP on your computer.

First use GIMP to open an image. It can be any image or you can use the one supplied by this lab (`upitt_seal.jpg`). We are going to perform the following tasks:

1. Resize the image so that its width and height are power of two and not too big
2. Export the image into a raw RGB format

Once you open an image in GIMP, go to the menu Image → Scale Image as shown below:



Set the width and the height to 256 in px unit and click the Scale button. Now go to File → Export As. Click at "Select File Type (By Extension)" and pick "Raw image data". Change the name to something else with extension `.raw`. Make sure that it will be saved in the directory that your application can open (e.g., same as `fshader.glsl` and `vshader.glsl`) and click "Export". Now try to run the application again but this time, open the new raw image that you just created. **Be careful**, you need to adjust the `width` and the `height` variables to match the size of your new image.

What to Do?

For this lab, make it simple. Perform the following:

1. Find an image of a wall with some texture. A brick wall, wooden wall, etc.
2. Resize your image so that the width and the height are power of two but no bigger than 1024×1024. The file size will be huge.
3. Export your resized image to a raw RGB.
4. Display that image on the given program instead of the original `texture01.raw`
5. Demo your result in the next recitation.