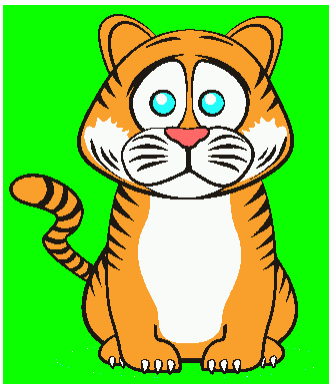
CPSC 4040/6040
Computer Graphics Images

Assigned: 08/25/2021
Due: 09/01/2021 (before the class)

Quiz 1 *(Grading: 0–10 points)*

1. The picture on the right contains at least six distinct colors (including the outline and background color). Please identify and give a reasonable RGB specification for six of these colors, assuming that the R, G, and B values are in the range 0.0 to 1.0. Then, give the corresponding six appropriate RGB values in hexadecimal notation that you would store in a pixmap, if the pixmap uses three unsigned 8-bit binary numbers to store the color channel values. (*Hint:* you can use any image processing tool to approximate colors, or simply use your intuition). [**3pt**]



2. Please provide appropriate comments explaining what is being done on the lines of the code below. The code uses a 2-D array for storing an image pixmap. [**4pt**]

```
1  struct pixel {
2     unsigned char r, g, b;
3  };
4
5  pixel **pixmap;
6  unsigned int W, H;
7
8
9  pixmap = new pixel*[H];
10 pixmap[0] = new pixel[W * H];
11 for(int i = 1; i < H; i++)
12    pixmap[i] = pixmap[i - 1] + W;
13
14 //....assume we read some image file and stored it in pixmap
15
16 for(int row = 0; row < H; row++)
17    for(int col = 0; col < W; col++) {
18       pixmap[row][col].r = 255 - pixmap[row][col].r;
19       pixmap[row][col].g = 255 - pixmap[row][col].g;
20       pixmap[row][col].b = 255 - pixmap[row][col].b;
21    }
```

3. Similar to the previous question, we are allocating two images, but now we store them as 1D arrays of `pixel`'s. Assume that `pixmap1` receives content from reading some image of size WxH. Fill in the code for the `for` loop so that `pixmap2` is assigned the pixel values of `pixmap1`, but is *flipped vertically*, i.e., the first row of `pixmap2` should be the last row of `pixmap1` and so on. [**3pt**]

```
1  ...
2  pixel *pixmap1, *pixmap2;
3  unsigned int W, H;
4
5  pixmap1 = new pixel[W*H];
6  pixmap2 = new pixel[W*H];
7
8  //....assume we read some image file and stored it in pixmap1
9
10 for(int row = 0; row < H; row++)
11    for(int col = 0; col < W; col++) {
12       pixmap2[                  ].r =
13       pixmap2[                  ].g =
14       pixmap2[                  ].b =
15    }
```