University of Windsor

60-256-01
System Programming
Winter 2013

Assignment – 2

Using the binary standard I/O functions (`fread()`, `fwrite()`, `fseek()`, ...), write a C program (call it `flipPic.c`) to transform the following picture into a upside down picture. Your program should invert the picture by directly read data from one file and writing it to another file, without the need of using any 2D (or even 1D) array.

The image uses the PGM grayscale picture, where every pixel has a value from 0 (black) to 255 (white) given as a byte. The image is simply a `nLines` X `nCols` matrix of bytes, where each byte store the gray level of the corresponding pixel. Here `nLines` is the number of lines, and `nCols` is the number of columns.

The function that was used to save the picture in the file is given below to explain the structure of the binary file containing the image.

```
void saveImage(char **image, int nLines, int nCols, FILE *fp) {
   int i;
   char buffer[256];

   /* A PGM format text header, needed for PGM viewers */
   fputs("P5\n", fp);
   fprintf(fp, "%d %d\n", nCols, nLines);
   fputs("255\n", fp);

   for(i = 0; i < nLines; i++)
      fwrite(image[i], nCols, 1, fp);
}
```

Note: Use the input image (image1.pgm) provided for testing.