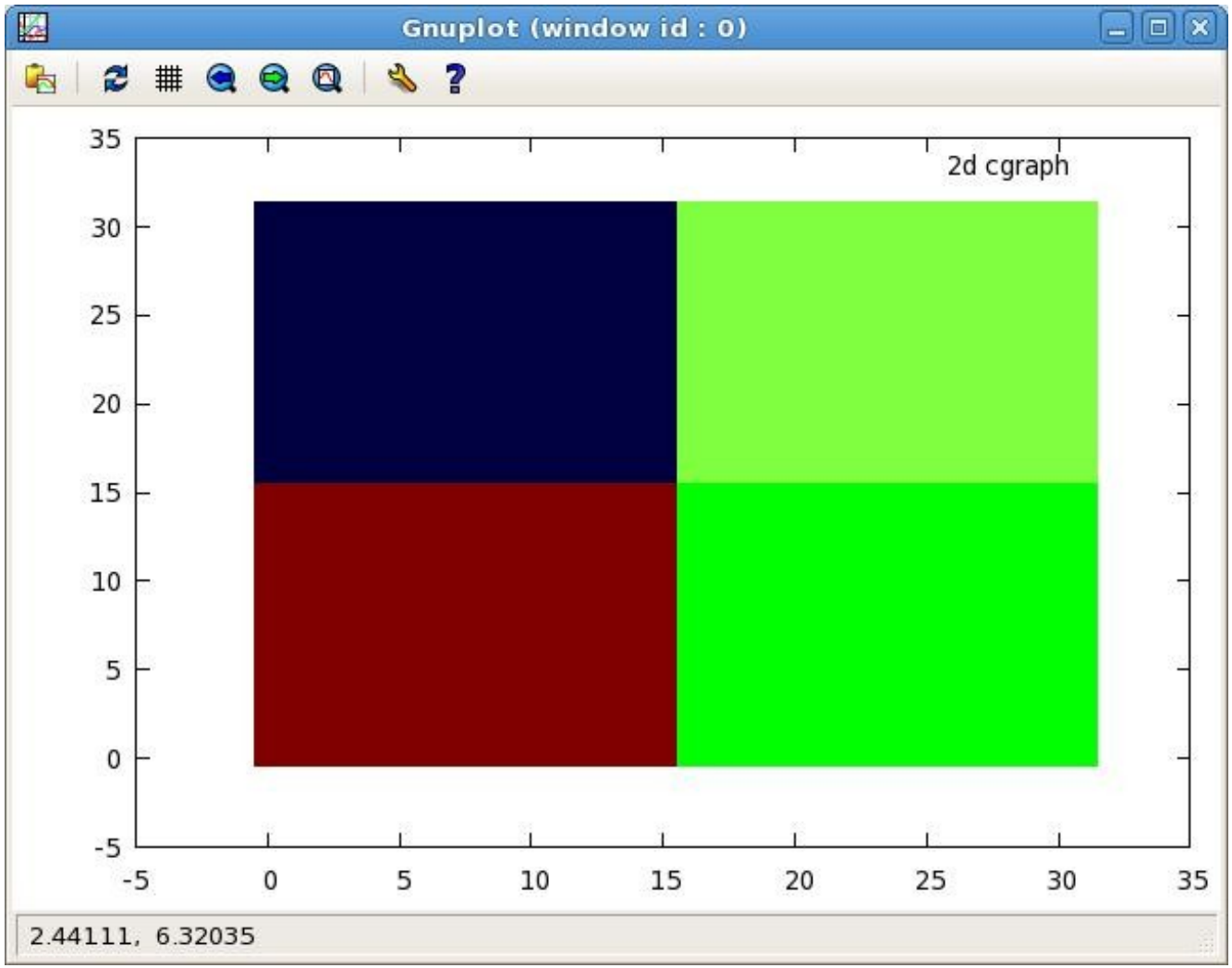
Building Programs Using Classes

- Top Down Design
- Problem 1
- An image class
- gplot class revisited
- Top Down Design for Problem 1
- Problem 2

The Problem

- Write a program to draw a checkerboard pattern of red, green, and blue blocks with prescribed color values and a block which shows the color that results from combining the red, green, and blue values with their prescribed intensities.
- The program should read in the width and height of the blocks, the red, green, and blue intensities.

The Problem


Gnuplot (window id : 0)
2d cgraph
35
30
25
20
15
10
5
0
-5
-5
0
5
10
15
20
25
30
35
2.44111, 6.32035

Top Down Design

- Top level:
  - read in block width, height
  - rows =2, cols=2
  - for each row,
    for each col
    write the block in image
  - plot image

Top Down Design

- write block image:
  - determine block color
  - for each block row,
    for each block col
    write pixel color

The Class

- gimage.h
- class gimage{

```
friend class gplot;
public:
int width,height;

//allocate memory for a width x height image
gimage(int pwidth,int pheight);

//add/change a pixel with value c to the image at position (x,y) ;
void addpixel(int x, int y, unsigned char c[]);

//get the value of a pixel c[3] in the image at position (x,y);
void getpixel(int x, int y, unsigned char c[]);

private:
unsigned char *image;
};
```

gplot class revisited

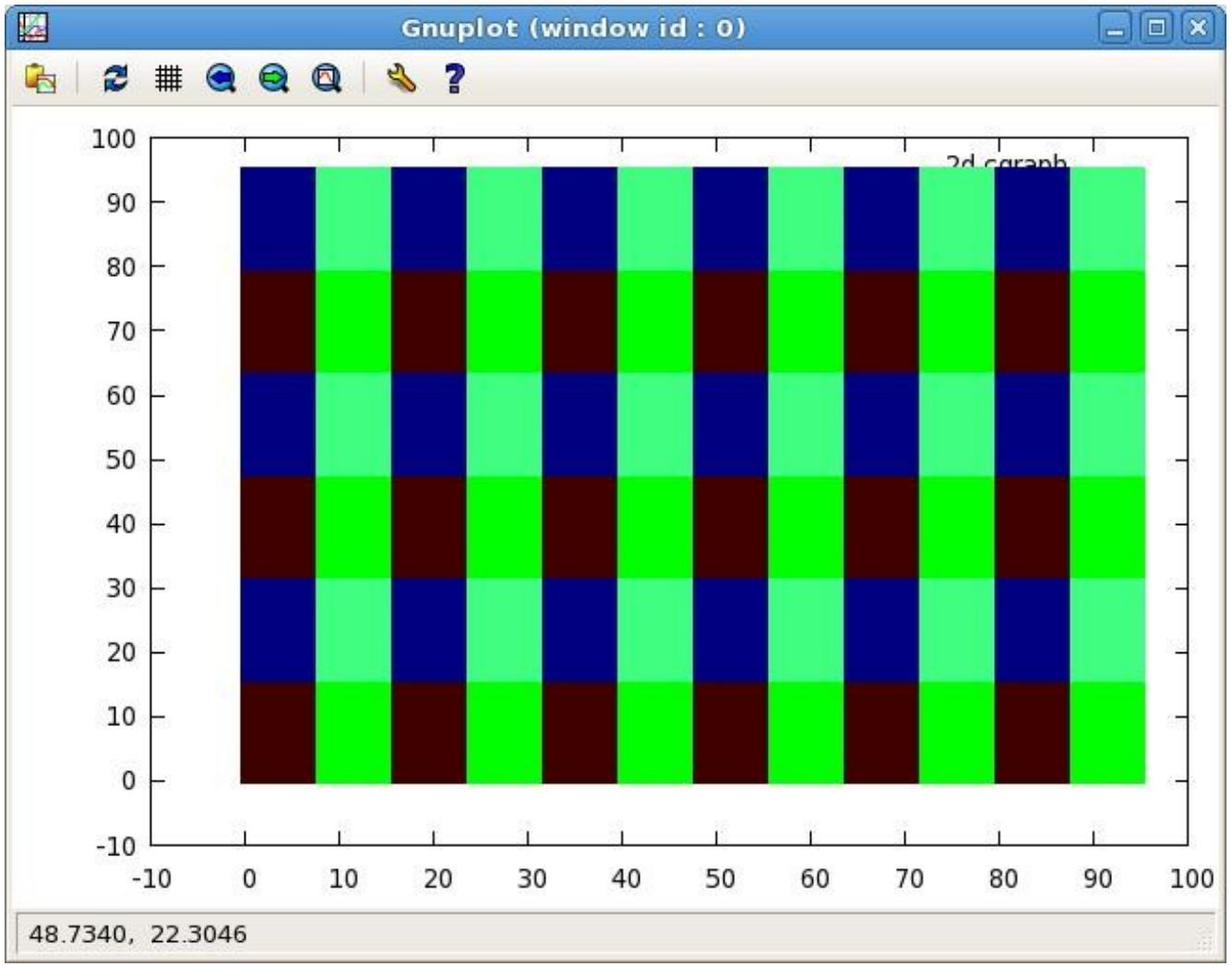
- gplot.h
- /*Display picture store in image */
  void rgbimage(gimage image);

- Image contains height and width, but these are private so gplot must be a friend class.

Homework 7
(Due Dec 1 before class)

- Design a program to draw 2d array of checkerboard patterns of red, green, and blue blocks with prescribed color values and a block which shows the color that results from combining the red, green, and blue values with their prescribed intensities.
- The program should read in the width and height of the blocks, the red, green, and blue intensities, and the number of horizontal an vertical block to be drawn.

Exercise


Gnuplot (window id : 0)
2d cgraph
100
90
80
70
60
50
40
30
20
10
0
-10
-10
0
10
20
30
40
50
60
70
80
90
100
48.7340, 22.3046