

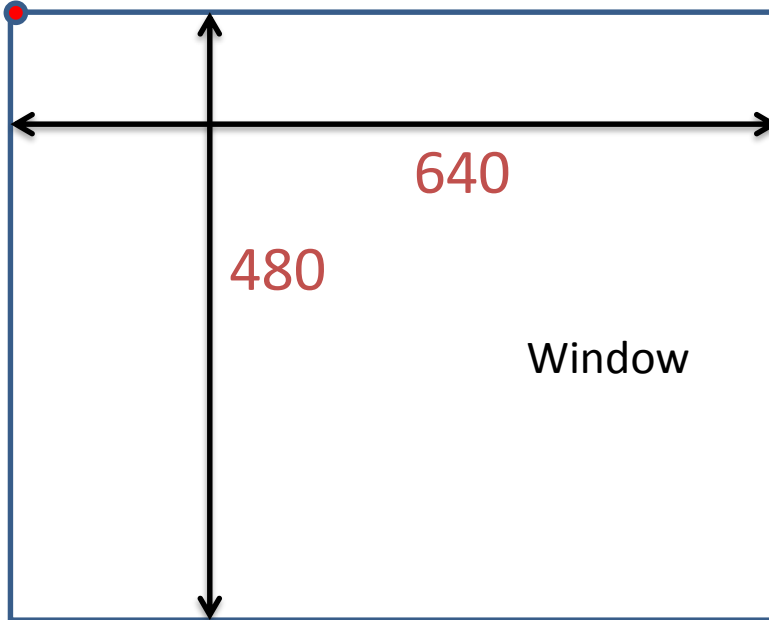
HW1 and Open GL background

Hardware Coordinates

(0,0)

Screen

(100,150)



Window

A GL Program to Open a Window

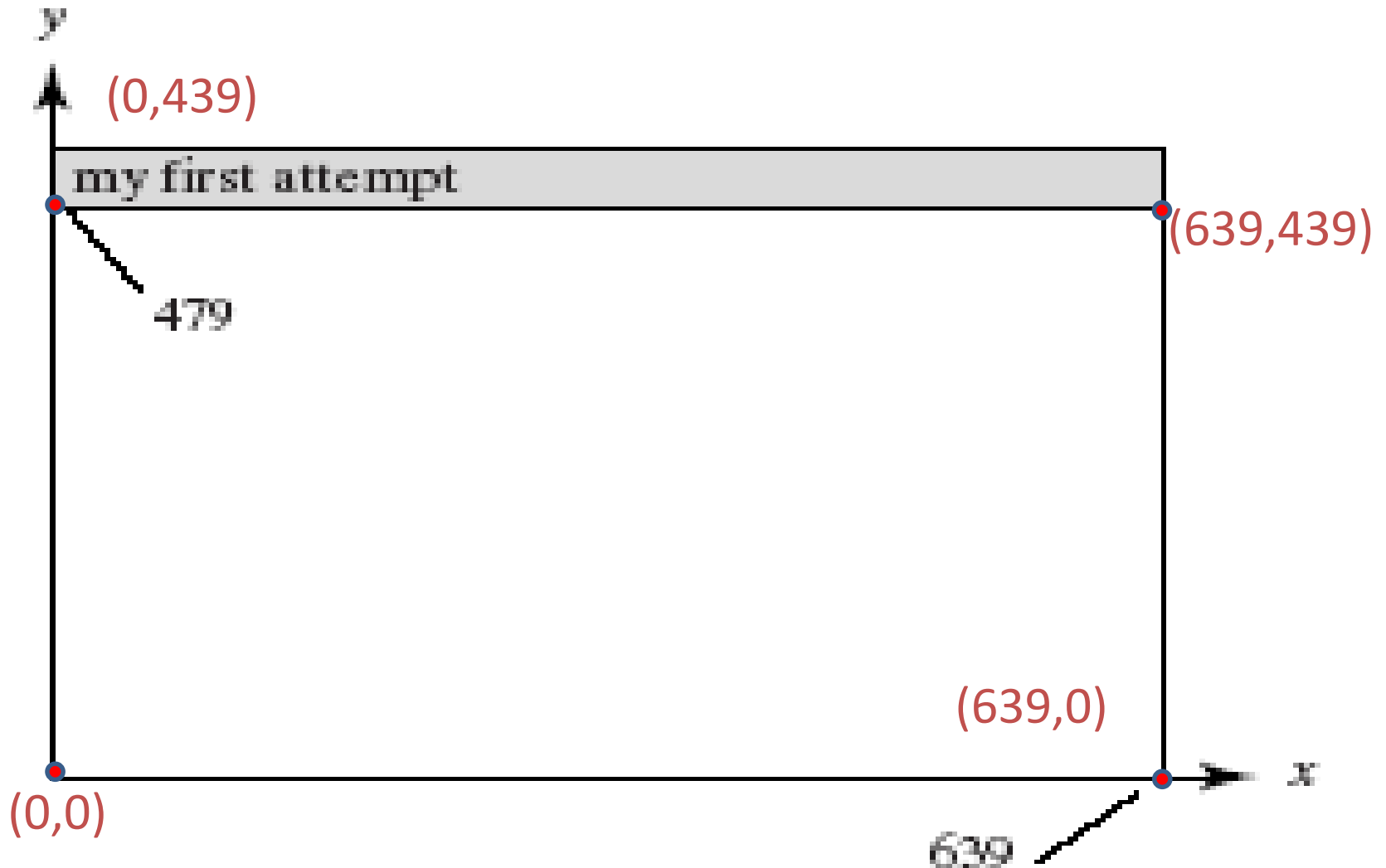
```
// appropriate #includes go here – see Appendix 1
void main(int argc, char** argv)
{
    glutInit(&argc, argv);    // initialize the toolkit
    glutInitDisplayMode(GLUT_SINGLE |
        GLUT_RGB);           // set the display mode
    glutInitWindowSize(640,480); // set window size
    glutInitWindowPosition(100, 150);
    // set window upper left corner position on screen
    glutCreateWindow("my first attempt");
    // open the screen window (Title: my first attempt)
    // continued next slide
```

Part 2 of Window Program

```
// register the callback functions
glutDisplayFunc(myDisplay);
glutReshapeFunc(myReshape);
glutMouseFunc(myMouse);
glutKeyboardFunc(myKeyboard);
myInit(); // additional initializations as necessary
glutMainLoop(); // go into a perpetual loop
```

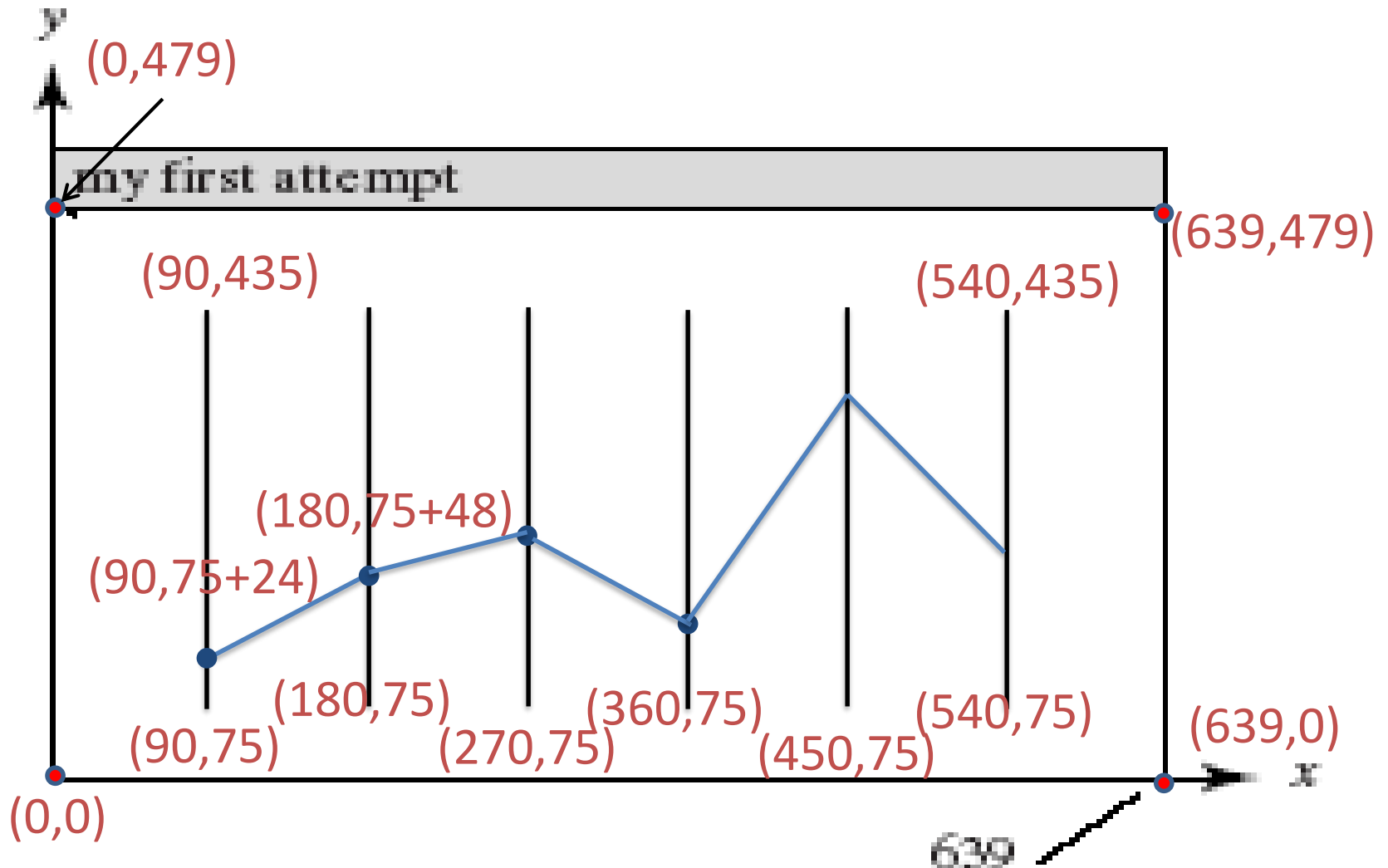
- Terminate program by closing window(s) it is using.

SW coordinates: Effect of OpenGL Program swap coordinates

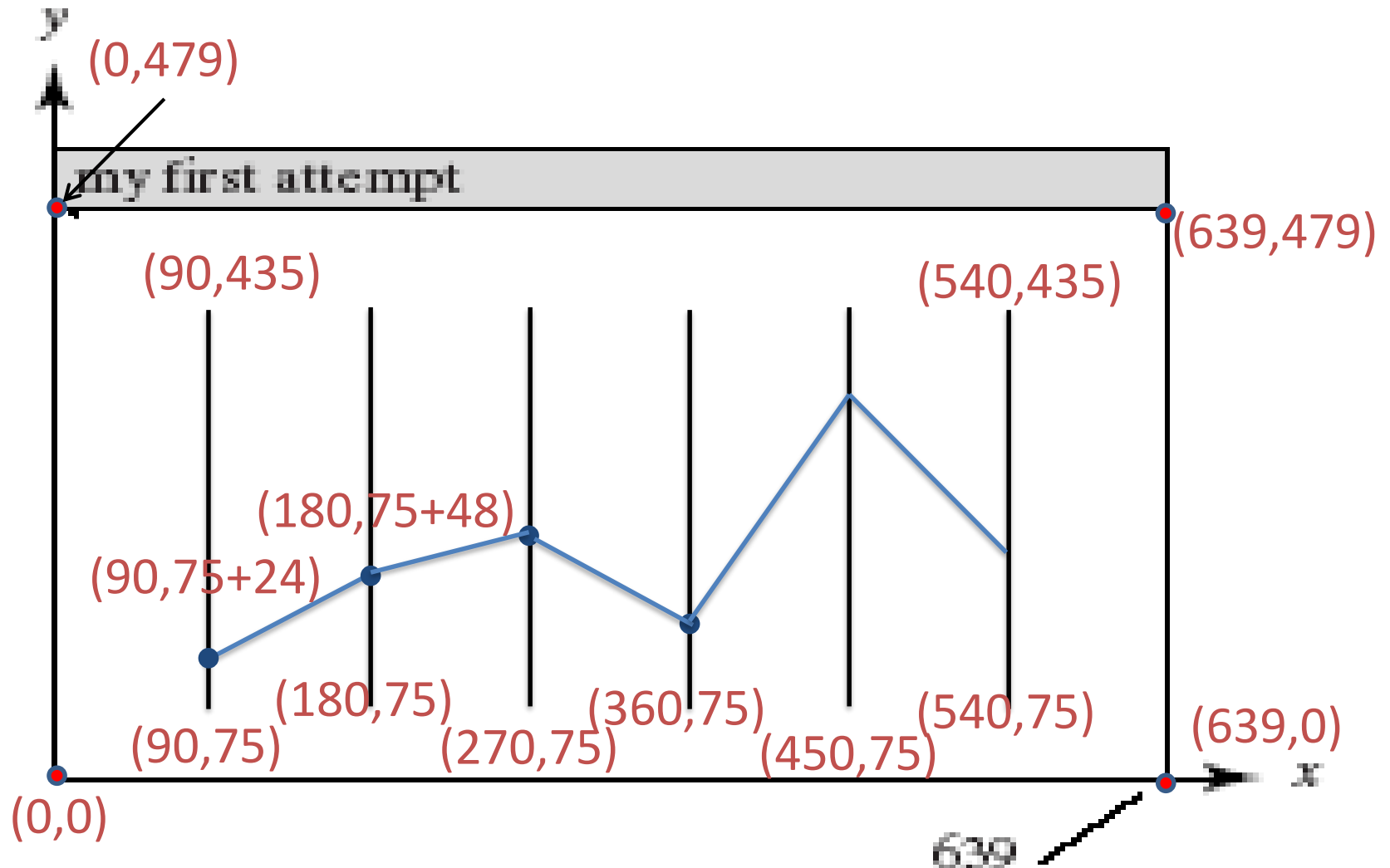


SW coordinates: Effect of OpenGL Program

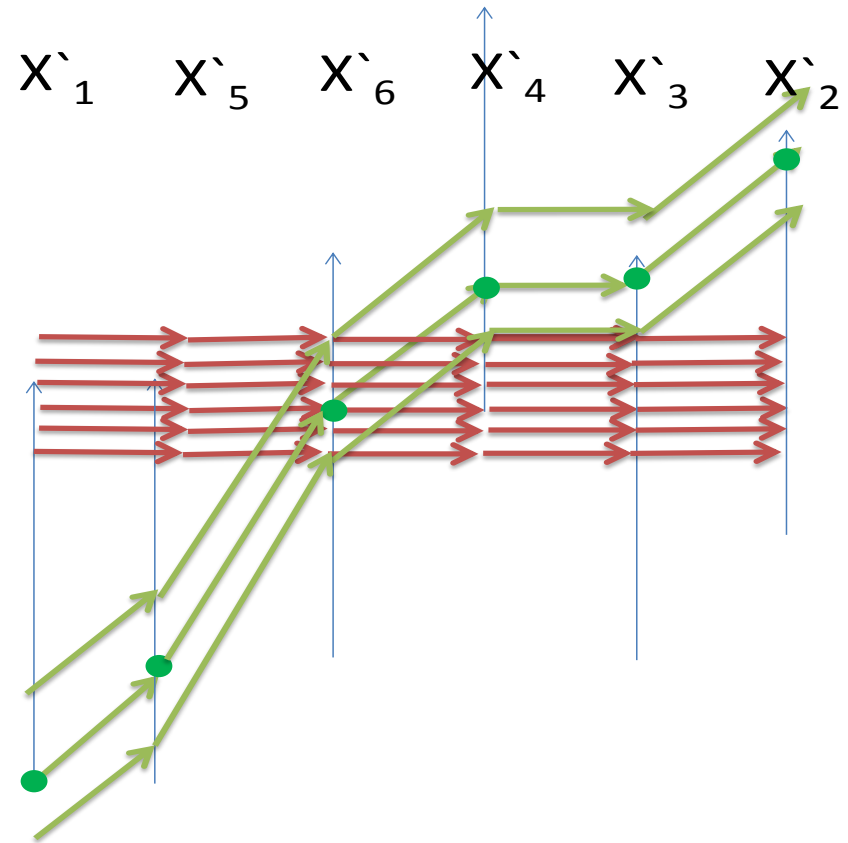
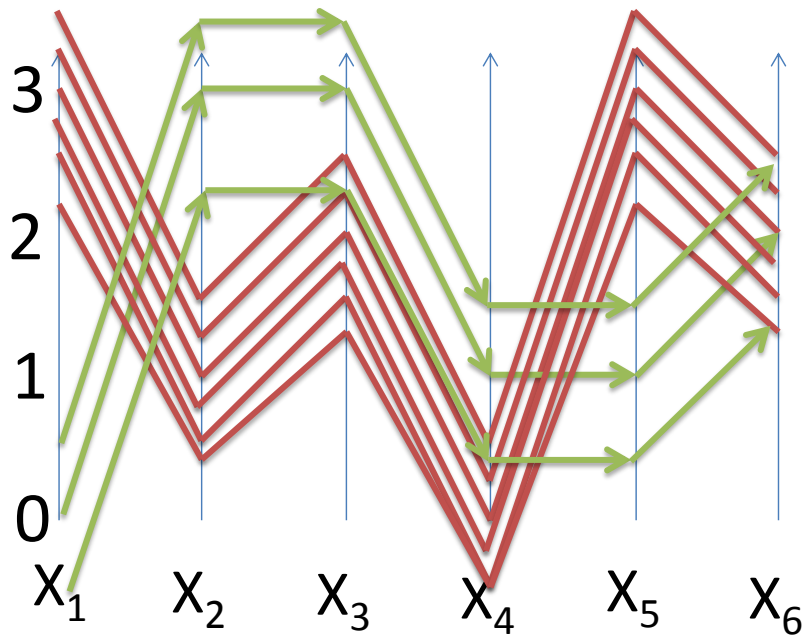
swap coordinates

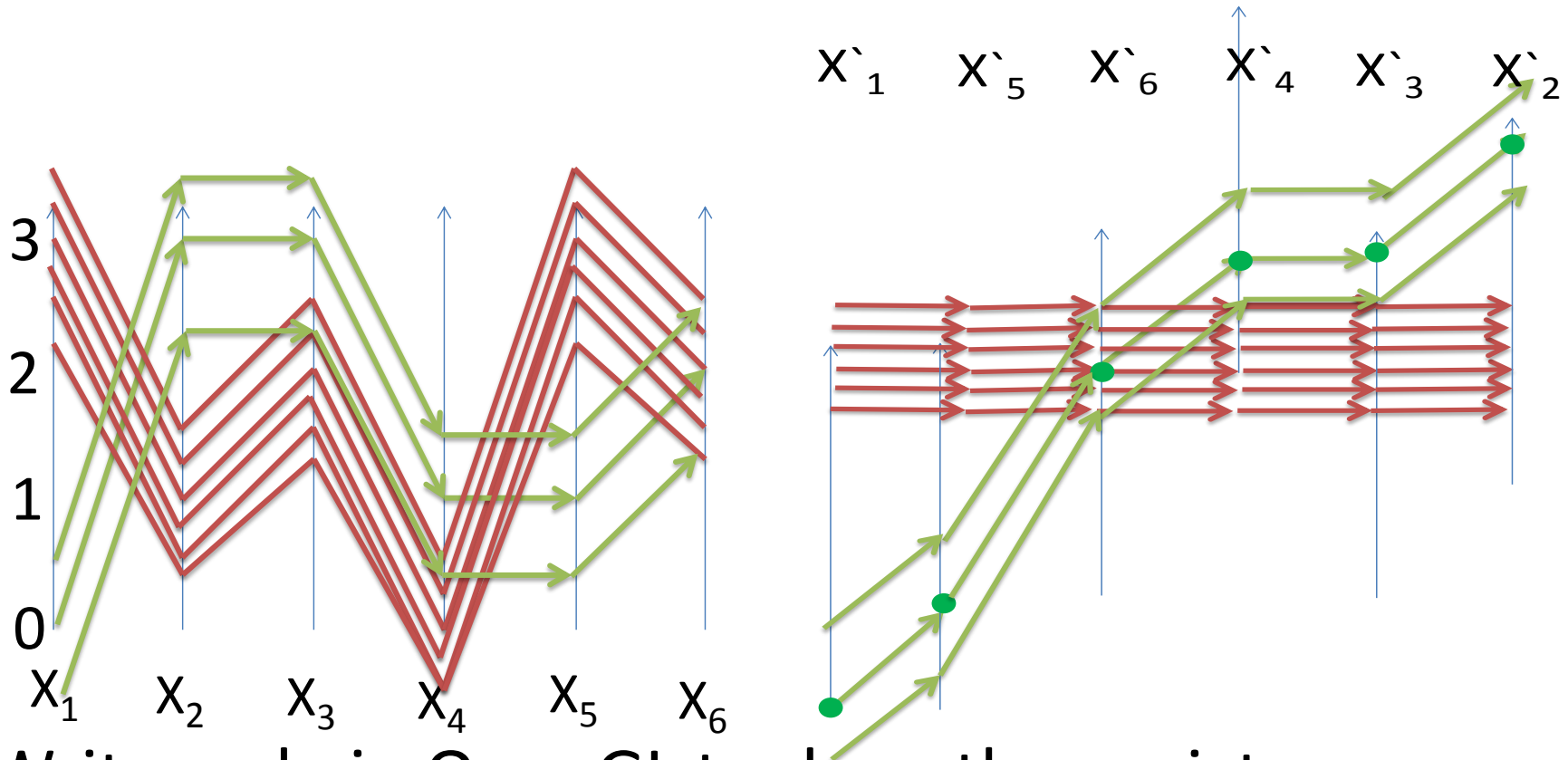


Write code in OpenGL to draw this picture



Write code in OpenGL to draw these pictures

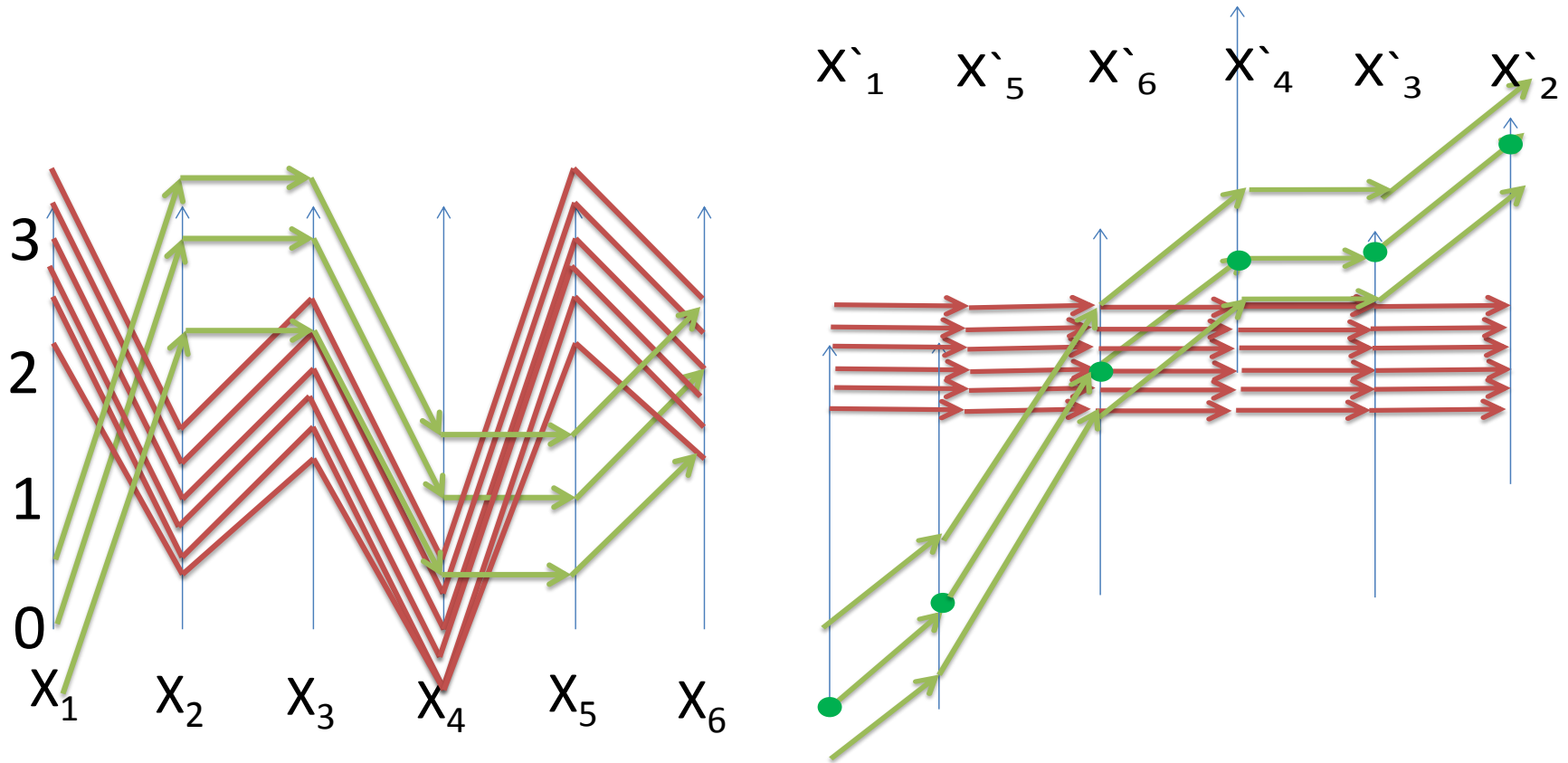




Write code in OpenGL to draw these pictures
with 6-D data read from the file

In the file the top red line is $(x_1, x_2, x_3, x_4, x_5, x_6) = (3.5, 1.5, 2.5, 0.5, 3.5, 2.6)$

These are distances from the beginning of each coordinates.



Generalize code for n up to 10 and 100 n -D points of tree classes colored red, green and blue.

N-D data input

- The program must be able to read data from the file
- Data size: dimension $n=10$
- Number of 10-D points is 100

Experimenting

- Select 3 datasets of different dimensions from 4 to 10 with up to 100 10-D points of two or 3 classes.
- Data can be taken here
- <https://archive.ics.uci.edu/ml/datasets.html>
- Use your program to visualize these data in the original Parallel Coordinates and in shifted coordinates. Use different shifts and coordinate orders in experiment to get simpler visualization.
-

Example of data selection: file car-MPG_Ab on neve\cs445\data

	A	B	C	D	E	F	G	H	I
1	cylinder	displacem	horsepow	weight	accelerati	mpg class		mpg	
2	8	304	193	4732	18.5	3		9	
3	8	307	200	4376	15	3		10	
4	8	360	215	4615	14	3		10	
5	8	318	210	4382	13.5	3		11	
6	8	350	180	3664	11	3		11	
7	8	400	150	4997	14	3		11	
8	8	429	208	4633	11	3		11	
9	8	350	160	4456	13.5	3		12	
10	8	350	180	4499	12.5	3		12	
11	8	383	180	4955	11.5	3		12	
12	8	400	167	4906	12.5	3		12	
13	8	429	198	4952	11.5	3		12	
14	8	455	225	4951	11	3		12	
15	8	302	129	3169	12	3		13	
16	8	302	130	3870	15	3		13	
17	8	302	140	4294	16	3		13	
18	8	307	130	4098	14	3		13	
19	8	318	150	3755	14	3		13	
20	8	318	150	3940	13.2	3		13	
21	8	350	145	3988	13	3		13	
22	8	350	145	4055	12	3		13	
23	8	350	150	4699	14.5	3		13	
24	8	350	155	4502	13.5	3		13	
25	8	350	165	4274	12	3		13	
26	8	350	175	4100	13	3		13	
27	8	351	158	4363	13	3		13	
28	8	360	170	4654	13	3		13	
29	8	360	175	3821	11	3		13	
30	8	400	150	4464	12	3		13	
31	8	400	170	4746	12	3		13	
32	8	400	175	5140	12	3		13	

- Sort data and take
- first 33 cases from class 3,
- first 33 cases from class 2, and
- first 34 cases from class 1.
- Sorted cases will be close to each other.