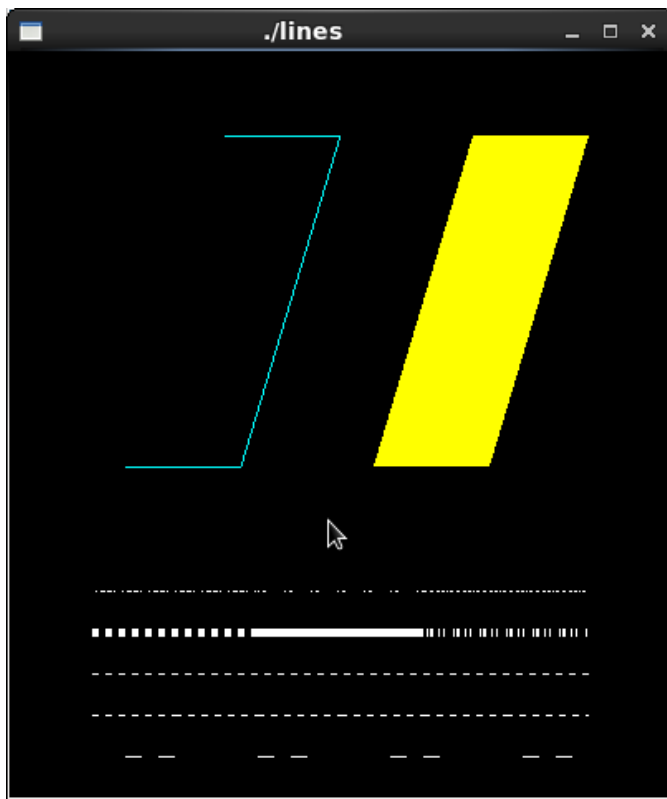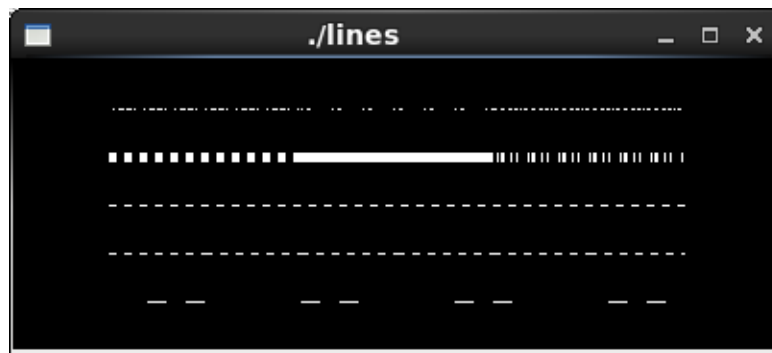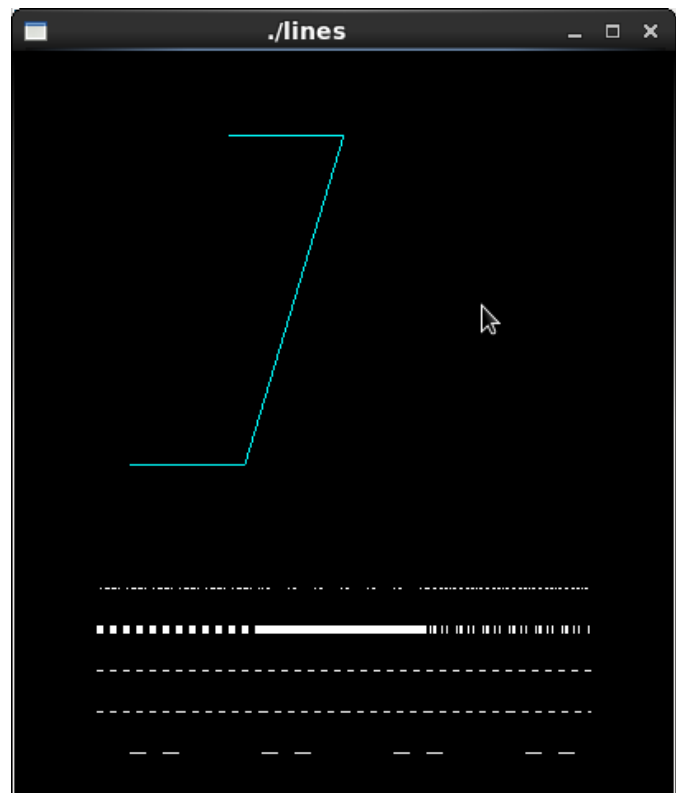Yazhuo Liu

Lab 4

Output:

CullFace disabled   cullFace enabled

Code:
```
//lines.cpp
#include <GL/glut.h>
#include <stdlib.h>

#define drawOneLine(x1,y1,x2,y2)  glBegin(GL_LINES); \
    glVertex2f ((x1),(y1)); glVertex2f ((x2),(y2)); glEnd();

void init(void)
```

```c
{
   glClearColor (0.0, 0.0, 0.0, 0.0);
   glShadeModel (GL_FLAT);
}

void display(void)
{
   int i;

   glClear (GL_COLOR_BUFFER_BIT);

   glColor3f( 0.0, 1.0, 1.0 );
   glPolygonMode( GL_FRONT, GL_LINE );
   glBegin (GL_POLYGON);
      glVertex2i( 70, 200 );
      glVertex2i( 140, 200 );
      glVertex2i( 200, 400 );
      glVertex2i( 130, 400 );
      glVertex2i( 70, 200 );
   glEnd();

   glEnable( GL_CULL_FACE );
   glCullFace ( GL_FRONT );
   glFrontFace ( GL_CCW );
   glColor3f( 1.0, 1.0, 0.0 );
   glPolygonMode( GL_FRONT, GL_FILL );
   glBegin (GL_POLYGON);
      glVertex2i( 220, 200 );
      glVertex2i( 290, 200 );
      glVertex2i( 350, 400 );
      glVertex2i( 280, 400 );
      glVertex2i( 220, 200 );
   glEnd();


/* select white for all lines  */
   glColor3f (1.0, 1.0, 1.0);

/* in 1st row, 3 lines, each with a different stipple  */
   glEnable (GL_LINE_STIPPLE);

   glLineStipple (1, 0x2EE4);  /*  dotted  */
   drawOneLine (50.0, 125.0, 150.0, 125.0);
   glLineStipple (1, 0x0019);  /*  dashed  */
   drawOneLine (150.0, 125.0, 250.0, 125.0);
   glLineStipple (1, 0x5B33);  /*  dash/dot/dash  */
   drawOneLine (250.0, 125.0, 350.0, 125.0);

/* in 2nd row, 3 wide lines, each with different stipple */
```

```
   glLineWidth (5.0);
   glLineStipple (1, 0x0F0F);  /*  dotted  */
   drawOneLine (50.0, 100.0, 150.0, 100.0);
   glLineStipple (1, 0xFFFF);  /*  dashed  */
   drawOneLine (150.0, 100.0, 250.0, 100.0);


   glLineStipple (1, 0x1234);  /*  dash/dot/dash  */
   drawOneLine (250.0, 100.0, 350.0, 100.0);
   glLineWidth (1.0);

/* in 3rd row, 6 lines, with dash/dot/dash stipple  */
/* as part of a single connected line strip         */
   glLineStipple (1, 0x0F0F);  /*  dash/dot/dash  */
   glBegin (GL_LINE_STRIP);
   for (i = 0; i < 7; i++)
      glVertex2f (50.0 + ((GLfloat) i * 50.0), 75.0);
   glEnd ();

/* in 4th row, 6 independent lines with same stipple  */
   for (i = 0; i < 6; i++) {
      drawOneLine (50.0 + ((GLfloat) i * 50.0), 50.0,
         50.0 + ((GLfloat)(i+1) * 50.0), 50.0);
   }

/* in 5th row, 1 line, with dash/dot/dash stipple    */
/* and a stipple repeat factor of 5                  */
   glLineStipple (5, 0x0330);  /*  dash/dot/dash  */
   drawOneLine (50.0, 25.0, 350.0, 25.0);

   glDisable (GL_LINE_STIPPLE);
   glFlush ();
}

void reshape (int w, int h)
{
   glViewport (0, 0, (GLsizei) w, (GLsizei) h);
   glMatrixMode (GL_PROJECTION);
   glLoadIdentity ();
   gluOrtho2D (0.0, (GLdouble) w, 0.0, (GLdouble) h);
}

void keyboard(unsigned char key, int x, int y)
{
   switch (key) {
      case 27:
         exit(0);
         break;
   }
```

```
}

int main(int argc, char** argv)
{
   glutInit(&argc, argv);
   glutInitDisplayMode (GLUT_SINGLE | GLUT_RGB);
   glutInitWindowSize (400, 450);
   glutInitWindowPosition (100, 100);
   glutCreateWindow (argv[0]);
   init ();
   glutDisplayFunc(display);
   glutReshapeFunc(reshape);
   glutKeyboardFunc(keyboard);
   glutMainLoop();
   return 0;
}
```

Report:

       I modified lines.cpp to display different line patterns. I changed the lineStipple values so it displays something else than before. I added two parallelograms using different polygon modes. However one of them has an error, there is a missing line which makes the polygon unclosed. Other than that, I think I did everything else well.