257 / 757 **Programming in the Arts with Processing** **In Class Exercise #7**	**Day:** **Thur 2.6.14** **Due:** **In Class** **Goal: Rotation, Translation, and** **Control in 3D**

Course Web Site:
> http://www.andrew.cmu.edu/course/60-257/

Reading:
  Posted on the calendar web page available from the link shown above.

Assignment:
  Use the code below and on the next page as your starting code.
  You need to add two functions to take user input:

- **mouseMoved( )**
  which will alter the fill value of the box:
    - increase the value of **redValue** if the mouse moves to the right
    - decrease the value of **redValue** if the mouse moves to the left
- keyPressed( )
  which will react to four key inputs:
    - '**+**' will increase the value of **rotXDelta** by 1
    - '**-**' will decrease the value of **rotXDelta** by 1
    - ' ' will increase the value of **transZDelta** by 1
    - '**r**' will reset all variables to their original value (DO NOT call **setup()**)

<div align="center">Starting Code:</div>

```
float rotX, rotXDelta;
float redValue;

float transZ, transZDelta;

void setup ( )
{
  size( 800, 500, P3D  );
  rotXDelta = 0;
  rotX = 0;
  redValue = 127;

  transZ = 0;
  transZDelta = 5;

  textSize( 18 );
  textAlign( CENTER );

  rectMode( CENTER );
}
```
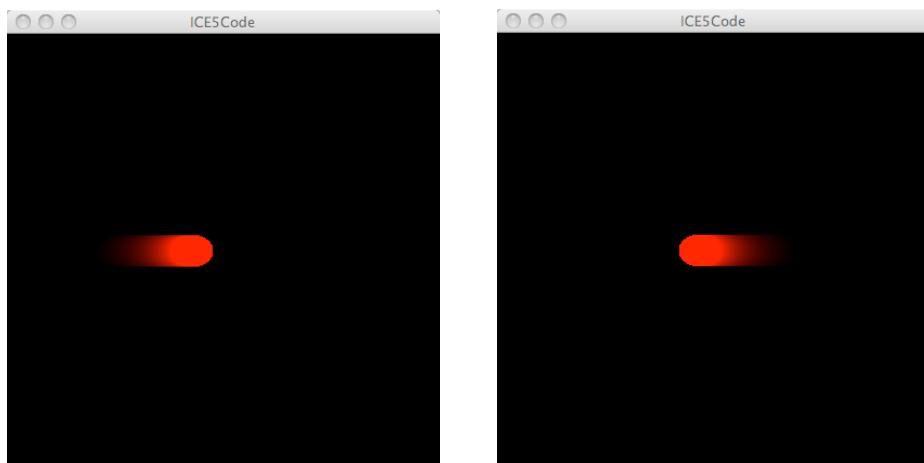
```
void draw ( )
{
  pushMatrix( );
    prepareScreen( );
    drawFigure( );
  popMatrix( );
  showStats( );
}

void drawFigure( )
{
  noStroke( );
  fill( redValue, 0, 0 );
  box( 100 );
  fill( 255, 255, 0, 70 );
  rect( 0, 0, 40, 30 );
  pushMatrix( );
    fill( 0, 200, 200, 70 );
    rotateY(radians( frameCount ) );
    box( 50 );
  popMatrix( );
  pushMatrix( );
    fill( 200, 0, 200, 70 );
    rotateY(radians( -frameCount*2 ) );
    box( 20 );
  popMatrix( );
}

void prepareScreen( )
{
  background( 0 );
  lights( );
  translate( width/2, height/2, transZ );
  stroke( 200, 200, 0 );
  line( -200, 0, 0, 200, 0, 0 );
  fill( 200, 200, 0 );
  text( "X axis before rotation.", -200, -5, 0 );
  rotX += rotXDelta;
  rotateX( radians( 20 ) );
  rotateY( radians( rotX ) );
  text( "X axis during rotation.", 200, -5, 0 );
  line( -200, 0, 0, 200, 0, 0 );
}

void showStats( )
{
    fill( 255, 0, 0 );
    text( "redValue = " + redValue, 100, 20 );
    fill( 0, 255, 0 );
    text( "rotX = " + rotX, 100, height - 40 );
    text( "rotXDelaa = " + rotXDelta, 100, height - 20 );
    text( "transZ = " + transZ, 100, height-60 );
}
```