257 / 757

Programming in the Arts with Processing

Homework 6

Start: Tue 2.4.14
Due: Tue 2.18.14
Goal: No One Can Hear You Scream in Space . . .

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:
You will continue to work with control (if, if/else, if/else/if) and with defining your own functions. You will explore 3-D space using either the P3D or the OPENGL renderers and the pushMatrix( ) / popMatrix( ) methods and the 3D primitives sphere( ) and box( ).

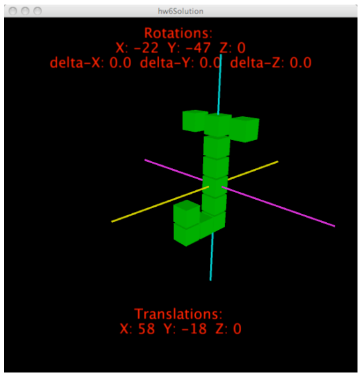
Specifications:

1. _____Put the required information in a comment at the top of your program
2. _____You will draw only one of your initials (the most interesting) but you will draw it in three-dimensional space. To do this, you should use the Processing file provided with this download.
3. _____The initial must be primarily composed of a series of spheres and/or boxes using the **`sphere( )`** and/or **`box( )`** function from the **`3D Primitive`** section of the Processing API. You may use other functions that draw shapes if you can get them to work properly. Remember that 2D shapes have no depth and can disappear briefly during a rotation. Such brief disappearance is ok.
4. _____The initial must be drawn in all three planes. If all of the spheres/boxes that make up your initial lie in a single plane, you will lose major points. Look at the demo below.
5. _____The initial (0,0,0) point will be the middle of the graphics screen. Your initial must originate in a way that it are centered in the graphics window. We will “fly” around your initial using keyboard and mouse input. The physical center of the initial must be at this point so rotations work properly. This will be demonstrated in class.
6. _____The use of color is up to you.
7. _____The use of lighting of some forms is required but its use is up to you.
8. _____The user controls rotations using key input as described below.
9. _____The user controls translations using the mouse as described below.
10. _____Translation and Rotation data must be displayed on the screen at all times. It must be completely visible when the program begins execution though it is ok if it is obscured by later translations and/or rotations.
11. _____There must be no ongoing movement when the program begins.
12. _____Put detailed instructions for user input on the Open Processing page for this homework.

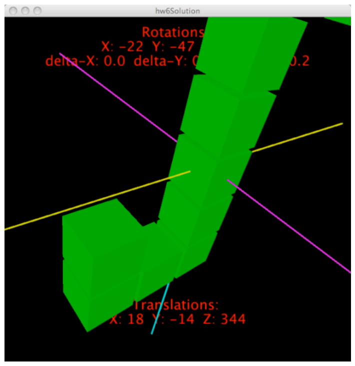
Exploring:
You should look at the Lights subset of functions. The simple way is to just turn on the lights but there are far more “interesting” functions in the lighting subset.

Handin:
Follow the instructions on the web page. This homework MAY NOT RUN on Open Processing but you need to post it there anyway.

Samples:


```
Rotations:
X: -22  Y: -47  Z: 0
delta-X: 0.0  delta-Y: 0.0  delta-Z: 0.0

Translations:
X: 58  Y: -18  Z: 0
```


```
Rotations
X: -22  Y: -47
delta-X: 0.0  delta-Y: 0                .2

Translations:
X: 18  Y: -14  Z: 344
```

Motion Control:

Keyboard input	Resulting Motion
(uppercase) ***X***	x axis rotation delta increased in the positive direction
(lowercase) ***x***	x axis rotation delta increased in the negative direction
(uppercase) **Y**	y axis rotation delta increased in the positive direction
(lowercase) **y**	y axis rotation delta increased in the negative direction
(uppercase) **Z**	z axis rotation delta increased in the positive direction
(lowercase) **z**	x axis rotation delta increased in the negative direction
s	All rotation deltas are set to zero and rotations stop
Space	All translation variables are set to zero **BUT** rotations continue

Mouse input: mouseDragged( ) is used as follows	Resulting Motion
mouseButton == LEFT && mouse is dragged rightward	x translation is increased -- initial moves to the right
mouseButton == LEFT && mouse is dragged leftward	x translation is decreased - Initial moves to the left
mouseButton == LEFT && mouse is dragged upward	y translation is decreased -- initial moves up
mouseButton == LEFT && mouse is dragged downward	y translation is increased - Initial moves down
mouseButton == RIGHT && mouse is dragged upward	z translation is decreased -- initial moves closer
mouseButton == RIGHT && mouse is dragged downward	z translation is decreased - Initial moves away