CS 450 Project #2
Using Transformations to Animate a Carousel Horse!

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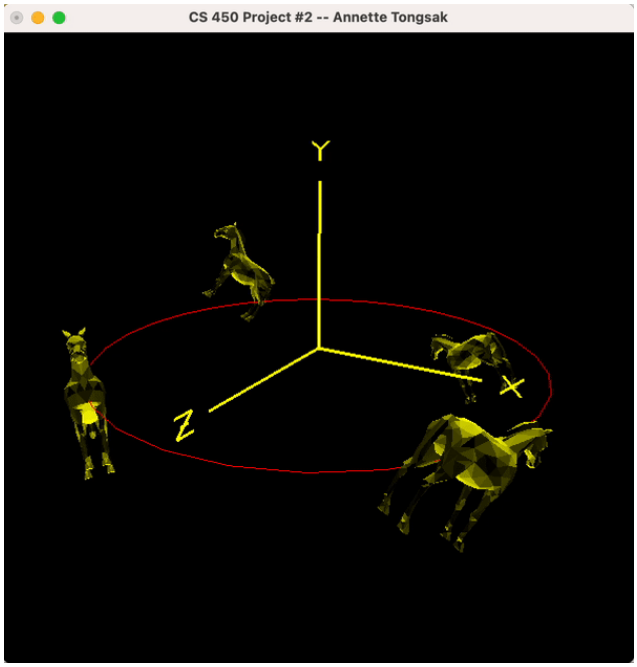

Video link

To create this display, I worked in this order:

1) Drew the circle and the horse
    a) Using the sample code, I drew a red circle of radius 2. I then referenced CarouselHorse0.10.550 and used the sample code to draw the horse, scaling the horse down by 0.5 to make my project more accurate to the intended end result.
2) Added a view switcher to the menu
    a) After studying the way other menu options were implemented, I created an option to switch between outside and inside view.
3) Implemented the translation of the horse to the outer circle
4) Implemented the horse's up and down movement
    a) Referencing the oscillating motion sample code, I made the horse translate up and down the y axis.
5) Implemented the horse's rocking movement
    a) Referencing the rocking motion sample code, I made the horse rock back and forth.
6) Implemented the horse's movement in a circle
    a) I wrote code to calculate the x and z-coordinates of the horse's position on the circle based on time and then used atan2 to return the inverse tangent of a given

-z and x. This orientation angle was converted to degrees and used to rotate the horse relative to the y-axis. As a result, the horse moves around in a circle and faces the direction it's going.

7) Reordered the previous implementations for the desired result
    a) The order goes:
        i) Move horse to the outer circle
        ii) Make horse rock back and forth
        iii) Make horse move in a circle
        iv) Move horse up and down
8) Pushed and popped the matrix
9) Adjusted and replicated the work done for Horse 1 for Horses 2-4
    a) The following extra credit horses were positioned 90 degrees apart on the circle and then had their circle rotation and up and down movement functions adjusted.