# COSC363 Assignment 1 Report

## Brief introduction

The scene is an illusion museum. The first illusion is a model of the Ames window. This model is modelled using a mesh file. The second model is a Moire pattern animated by using two quads texture mapped and then blending correctly to get the illusion effect. The third model is an animated ball being thrown by two pipe holes. The ball was animated using a parabola equation so that the effects of gravity in the real world could be seen. There are two static images texture mapped onto two separate quads. A teapot spinning around at its y-axis with a shadow. There is also a vase modelled by a surface of revolution underneath the spinning teapot. And both models are inspired by the lecture notes.

The flooring is a checkerboard but since it's an illusion museum going with the plain old black and white is not interesting, so I went with yellow and purple to make the ground pop. The walls are made from quad strips and are texture mapped with a nice stone wall texture from (Texture, 2005). In the scene there is also quad texture mapped with an image of an infinite hallway with a door. The infinite hallway image is from (Mainrenka) and the door image is from (Hoelscher Weatherstrip Manufacturing).

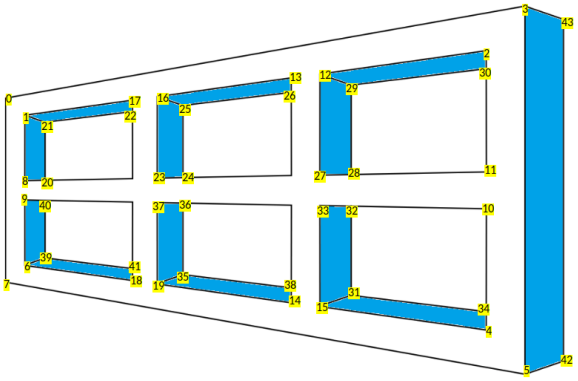
## Extra features

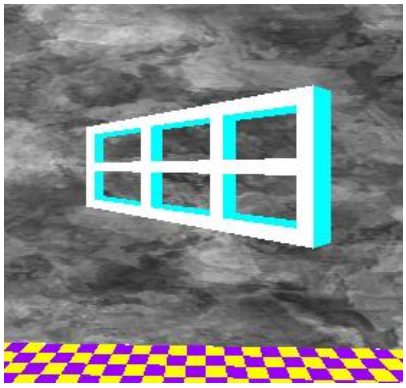
- There is a planar shadow cast by the teapot that is spinning.
- A physics-based animation is used when the white ball gets thrown from one canon to another.
- A sweep surface is used to create the stand underneath the spinning teapot and the model is texture mapped.
- The walls in the scene are texture mapped quad strips.
- There are two texture mapped quads with static optical illusions. The orange and blue optical illusion image is from CuriOdyssey(2020). The blue and pink optical illusion is from (Smartspacer).

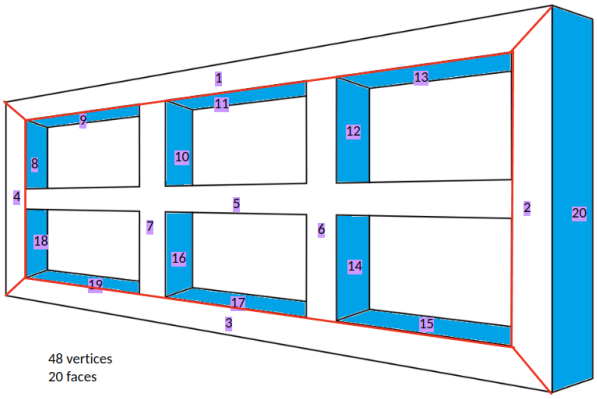
## Controls:

| Key | Action |
|---|---|
| 1 | Model 1 View |
| 2 | Model 2 View |
| 3 | Model 3 View |
| 0 | View From Entrance (Gallery View) |
| ← | Camera: Turn Left |
| → | Camera: Turn Right |
| ↑ | Camera: Move Forward |
| ↓ | Camera: Move Backward |

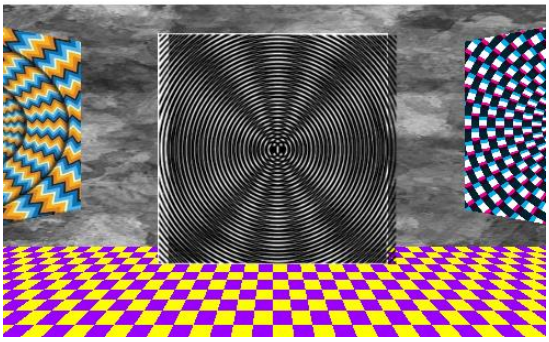
# Images



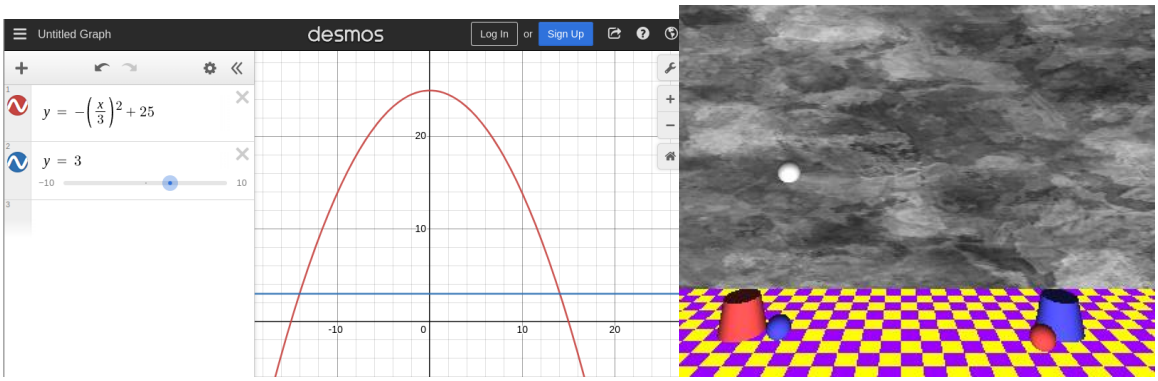





This is the Ames window.



This is a moire pattern illusion the image is from (National Research Council, 1993).




This animation uses a parabola calculation: $y = -\left(\frac{x}{3}\right)^2 + 25$. This equation to show translate the effect of gravity in the real world.

The teapot spins around anti clockwise and changes color from red to yellow. There is also a planar shadow cast by the teapot. The stand underneath the teapot is model using a surface of revolution. I just came up with a model to suit the overall scene and texture mapped the model using an image from (Texture, 2005).

## Build Commands

1. Open the terminal in the folder. Then type the follow command one by one.
2. g++ -Wall -c "assignment1.cpp"
3. g++ -Wall -o "assignment1" "assignment1.o" -lm -lGL -lGLU –lglut
4. ./assignment1

## Declaration

I declare that this assignment submission represents my own work (except for allowed material provided in the course), and that ideas or extracts from other sources are properly acknowledged in the report. I have not allowed anyone to copy my work with the intention of passing it off as their own work.
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31/3/23

## References


Textures. (2005). https://www.textures.com/

National Research Council. (1993). *Counterfeit Deterrent Features for the Next-Generation Currency Design*. https://nap.nationalacademies.org/read/2267/chapter/11

CuriOdyssey. (July 1, 2020). *14 Optical Illusions and How They Work – The Science of Perception.* https://curiodyssey.org/blog/14-illusions-how-they-work-science-perception/

Smartspacer. https://www.vecteezy.com/vector-art/163475-hypnosis-optical-illusion

Hoelscher Weatherstrip Manufacturing. https://www.hoelscherweatherstrip.com/catalog/knotty-alder/8-0-knotty-alder-double-doors/

Mainrenka. https://www.u-buy.co.nz/product/46F7KUL3Q-optical-illusion-rugs-non-slip-rug-for-indoor-hallway-front-door-bedroom-living-room-bathroom-doormats-home-decor-36x24-inch