CSCI 4250/5250 Project 4: Create A 3D Scene
Worth 300 pts

In this project, we will create a 3D computer graphics scene using Three.js. Students work in groups of two. The project will be completed in three stages.

Stage I – due *midnight*, Friday, November 13th – 100 points

Object Creation Requirements

Each student must create **two complete 3D objects**. These objects should be thoughtfully designed to fit naturally within the final project scene.

Object Creation Requirements

1. **Composite Object (using 3D primitives)**
   - Construct a composite object using **at least five 3D primitives** of **three or more different types** (e.g., sphere or half-sphere, cube, cone, cylinder, tetrahedron, etc.).
   - The design should demonstrate creativity and effective use of geometric combinations.
2. **Polygonal Mesh Object**
   - Create a custom 3D object using **polygonal mesh modeling**.
   - The mesh must include **at least six distinct faces**.
   - This object should represent something that **cannot be easily modeled** using standard primitives, extrusions, or surfaces of revolution.
3. **Projection Requirement**
   - Use **orthographic projection** for this stage of the project.
4. **Evaluation Criteria**
   - The project grade will be based on the **complexity**, **aesthetic quality**, and **appropriateness** of the objects designed.

Group Work Recommendation:
For students collaborating in groups, it is strongly recommended to develop the program within the **same project framework**. This will simplify the integration process when combining individual objects into the final unified scene.

Turn in the program in D2L using Dropbox "Project 4 Part I". Each student turns in his or her project individually.

Stage II (100 pts) – due *class time Tuesday*, November 25th -- in class demonstration

Scene Enhancement Requirements

Add the following elements to your scene:

1. **Extruded Shape Object**
    - Create and add at least one **extruded shape** object to the scene.
2. **Surface of Revolution Object**
    - Create and add at least one object formed as a **surface of revolution**.
3. **Additional Object of Choice**
    - Include one more object of **any type** that complements your scene's design.
4. **Animation Requirement**
    - Animate one of the objects in the scene.
    - The animation should **start and stop** when the **'A'** key is pressed.
5. **Material and Lighting**
    - Apply appropriate **materials** to different objects to achieve realistic surface appearance (e.g., metallic, matte, transparent).
    - Incorporate **multiple light sources** such as ambient, directional, point, or spotlights to create depth and highlight object details.
    - Adjust **light color, intensity, and shadow settings** to enhance mood and realism.
    - Ensure that lighting interacts naturally with object materials to produce convincing reflections and shading effects.
6. **Evaluation Criteria**
    - The grade for this part of the project will be based on the **complexity**, **creativity**, and **overall attractiveness** of your scene.

Turn in the program in D2L using Dropbox "Project 4 Part II". Only one copy of the project needs to be turned in for each team. List names of the team members in the program documentation.

In-Class Presentation Requirements

During your in-class demonstration, please address the following points:

- **Describe your scene and project goal** — briefly explain the theme, purpose, or concept of your scene.
- **Identify the 3D primitives used** — point out which primitive shapes were used to construct the composite objects and how they were combined.
- **Demonstrate the animation** — show how the animation works and explain what it represents.
- **Explain lighting and material properties** — describe the types of lights (e.g., ambient, point, directional, spot) and materials used and discuss how they enhance realism and visual quality.
- **Discuss challenges and solutions** — if applicable, describe any technical or design difficulties you encountered during development and how you resolved them.
- **Highlight special features** — showcase any additional features or creative elements that make your program unique or visually appealing.

Stage III Final (100 pts) – due midnight, *In class demonstration, 3:30-5:30pm, Tuesday Dec 9th*

Enhance your program by including the following features:

Project Requirements:

1. **Add at least three new and distinct objects** to the scene.
2. **Apply textures** to objects to improve visual realism.
3. **Incorporate additional effects**, such as shadows or lighting enhancements.
4. **Add a sound effect** that plays during the animation.
    - Start the animation by pressing the **'A'** key.
5. **Enable scene restoration** by pressing the **'B'** key to return to the original view.

After completing each stage, **create a one-minute video** that showcases your project. The video should guide the viewer through a **"walk-through"** or **"fly-over"** of your 3D scene, highlighting key details and features of the objects you have created.

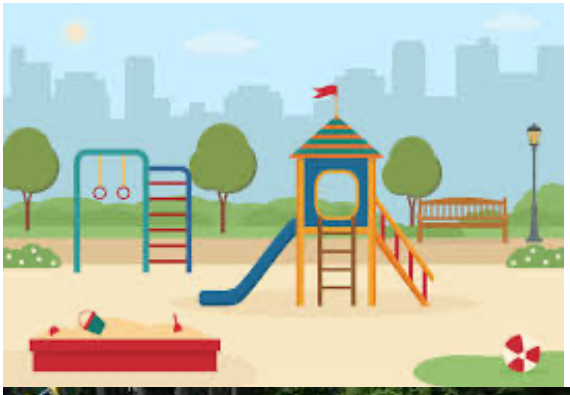
Turn in the program and the video in D2L using Dropbox "Project 4 Part III". (only need to turn in one copy of the project for each team)

Final Project Demonstration Guidelines

During your final project presentation, please make sure to:

- **Identify each new object** that you have added to the scene and briefly explain its purpose.
- **Show and describe the textures** applied to various objects, highlighting how they enhance realism or visual interest.
- **Demonstrate any animations**, explaining what they illustrate or how they improve interactivity.
- **Demonstrate the use of the "B" key** to restore or reset the scene to its initial state.
- **Play your one-minute recorded video** that showcases the final project in action.
- **Discuss challenges encountered** during the development process and describe how you resolved them.

The following example scenes are provided to **spark your imagination** and **help you explore different possibilities** for your own 3D scene design.




MENU


COFFEE SHOP