# DSBA-CPP-2024-Project

# Technical Assignment

## Team:

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## Topic:

Basic 3D Editor

## Description of the Project:

Our application will be used to build simple 3D environments. The user will be able to create primitive 3D objects, such as cubes, spheres and cylinders to then apply transformative operations on them: moving, rotating and scaling, constructing various structures this way.

## Requirements:

* **Programming Language**: The application will be developed using C++.
* APIs: User interface will be made with ImGui. 3D objects will be rendered with OpenGL.
* **Interface: The UI will provide tools to create, select and delete an object, as well as move, rotate and scale it.**
* **External Data Handling**: It will be possible to import and export STL formatted files.
* Project Architecture: MVC pattern will be utilized for better organization.
* **OOP Features: Inheritance and operator overloading will be employed to improve functionality.**
* **Error Handling**: For debugging, error handling and message logging systems will be implemented.

## Interface:

The GUI will include the following components

1. Scene

Here, the created objects and changes applied to them are displayed in real time.

1. Primitive menu

A list of icons representing basic 3D shapes. Clicking on one creates a new object.

1. Collection

A list of names of all created objects. It is used to select an object.

1. Operations menu

Used to select and apply the operations (moving, rotating, scaling) and their axes. It is possible to use multiple at once. Has a button to delete an object.

## Tasks:

1. **Project Initialization**:
   * Set up the Git repository with a README and the project structure.
2. Class structure:
   * Develop classes that handle user input, 3D objects creation and transformation, 3D image rendering.
3. **GUI interface**:
   * **Develop the GUI with the necessary widgets.**
4. **Error Handling Framework**:
   * Establish an error handling system to catch and respond to exceptions.
5. **Testing and Quality Assurance**:
   * Conduct thorough testing of all components.
6. **Deployment and Release**:
   * Release the first version of the application and monitor for issues.