Computer Graphics Assignment

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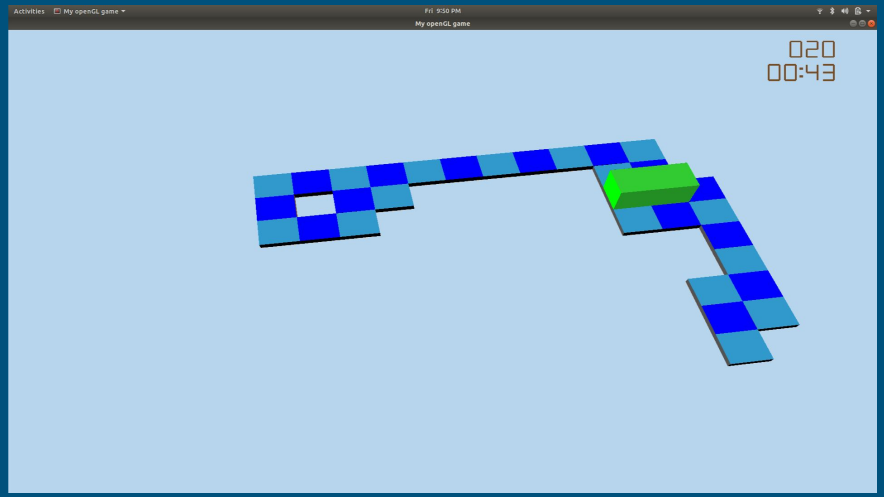
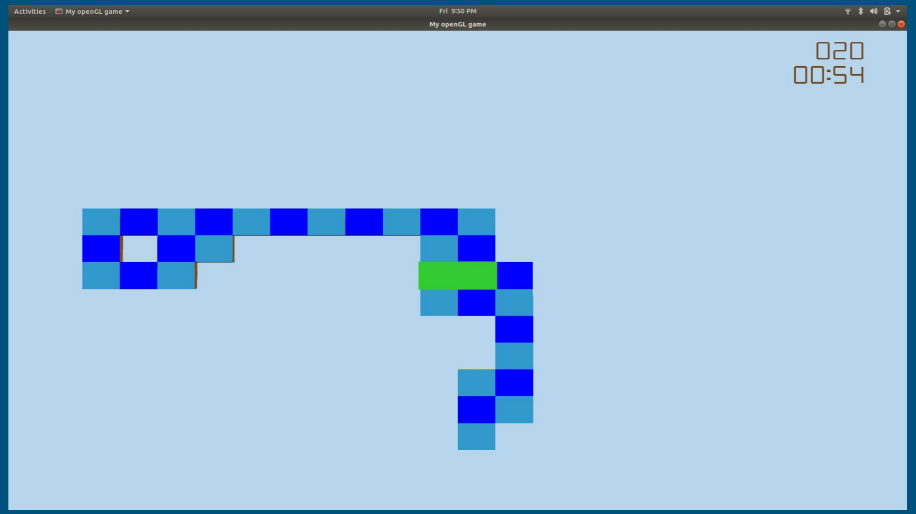
Overview

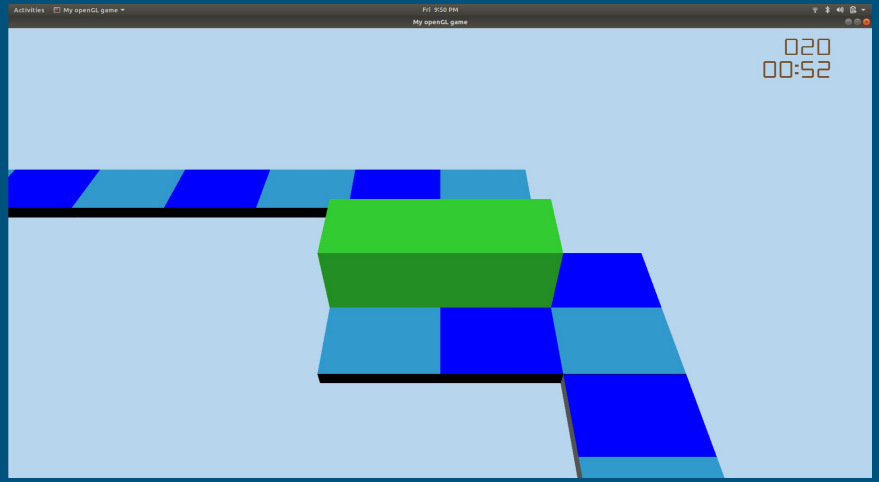
Our game is a simple puzzle game . The aim of the game is the make the cuboid pass through the hole in the surface . The cuboid has 3 orientations it can be along the x-axis , the y- axis or the z axis . The block can move forward , backwards or sideways and it will topple if the longer axis of the cuboid is perpendicular to the plane . The game also contains red colored tiles which are “weak tiles” and switches which are the tiles with a circle mark on them . Whenever the cuboid is standing upright on a weak tile it will fall and when it is standing upright on a switch it will close or open bridges . Currently this version oh the game has 2 levels . In addition to this the game has background audio and 4 views , namely front ,back , top and helicopter view



Level 1 Helicopter View

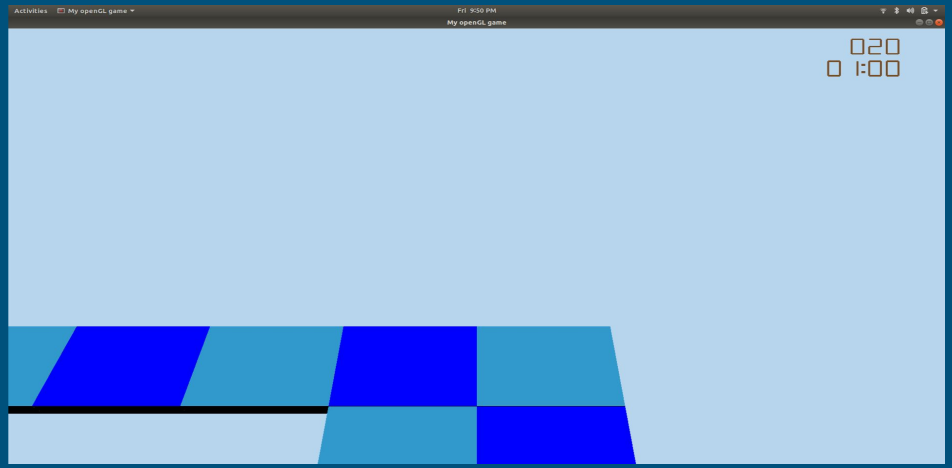
Level 1 Top View

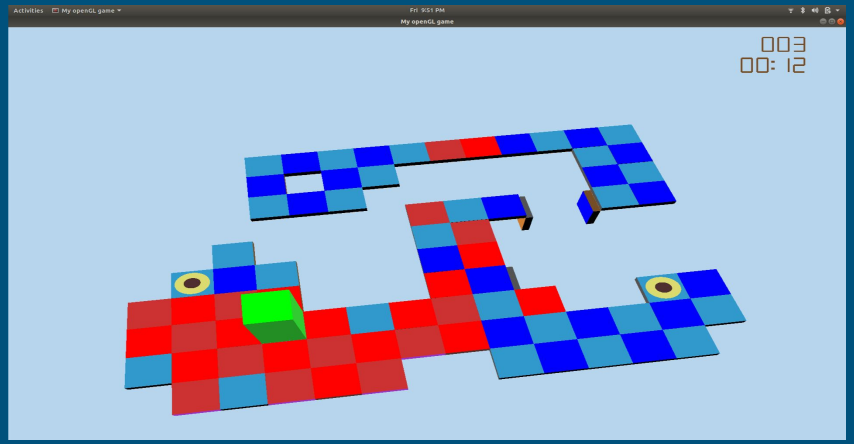




Level 1 Front View

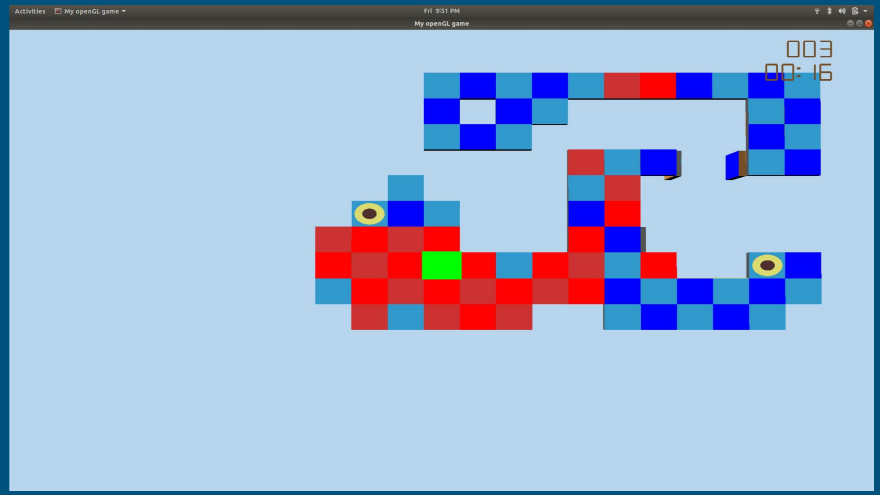
Level 1 Back View

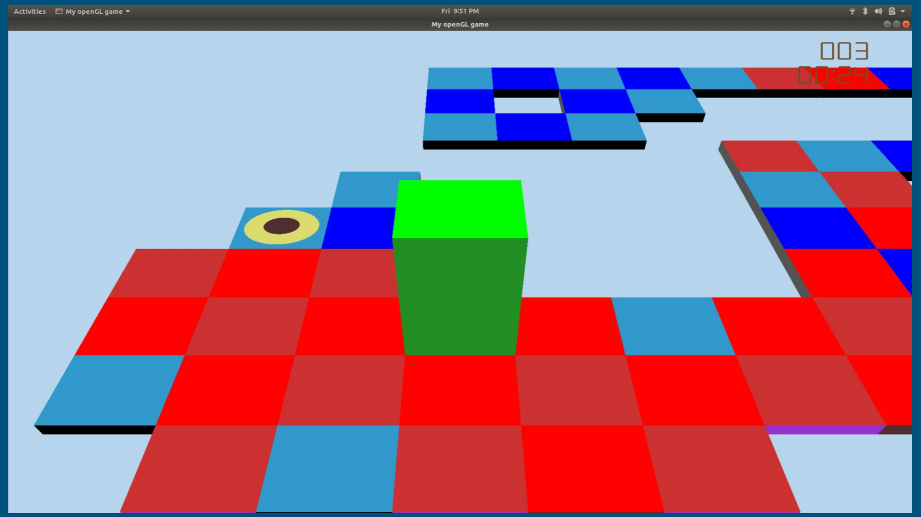




Level 2 Helicopter View

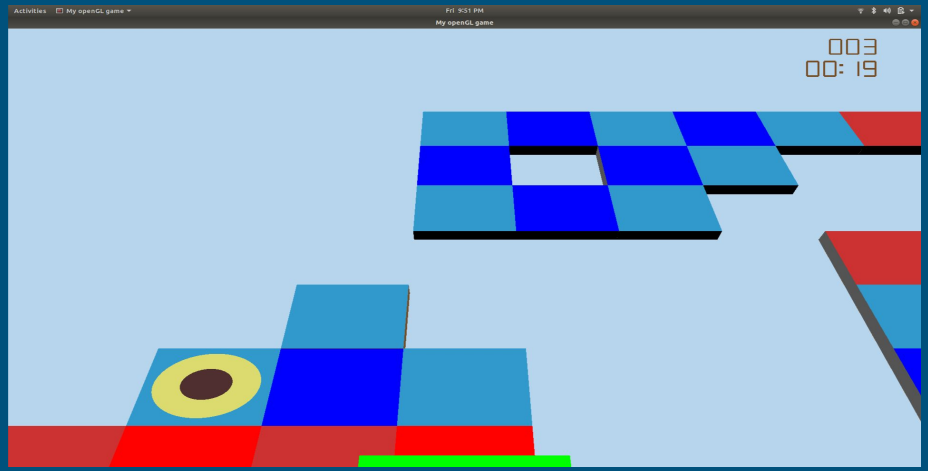
Level 2 Top View





Level 2 Front View

Level 2 Back View



Tools Used

- **Libao** : Libao is a cross-platform audio library that allows programs to output audio using a simple API on a wide variety of platforms

- **Mpg123** : The mpg123 distribution contains a real time MPEG 1.0/2.0/2.5 audio player/decoder for layers 1,2 and 3 (most commonly MPEG 1.0 layer 3 aka MP3), as well as re-usable decoding and output libraries. Among others, it works on GNU/Linux , MacOS , the BSDs, Solaris, AIX, HPUX, SGI Irix, OS/2 and Cygwin or plain MS Windows

- **GLFW3** : GLFW is an Open Source, multi-platform library for OpenGL, OpenGL ES and Vulkan development on the desktop. It provides a simple API for creating windows, contexts and surfaces, receiving input and events. GLFW is written in C and supports Windows, macOS, the X Window System and the Wayland protocol . It provides for Window contexts , keypress handling , Error handling , Reshaping windows as well as translation features .

- **GLM** : It is the OpenGL mathematics library . It provides the matrices and the coordinates . Different views of a scene can be rendered using this library . It also provides with the translation and rotation of an object in a window .

- **GLAD** : Glad generates a loader for your exact needs based on the official specifications from the Khronos SVN. This means they are always up to date! It was written in a way that you can easily extend it to other languages . Basically it provides loaders and pointers to the glfw functions . We can also use the GLEW3 instead of this as both serve the same purpose . The latest GLAD file should always be compiled with the program and the c file is available on the official page according to your specifications

Structs

- VAO
- COLOUR
- Sprite
- GLMatrices

Functions

- Load Shaders
- Error Handling
- Quit Game
- Draw 3D Object
- Audio (3 Functions)
- Key Presses
- Reshape Window
- Making Shapes(3 functions)
- Render the scene
- Make Models
- Main

VIDEO

Individual Contributions

- Fragment Shader , Vertex Shader , generating VAO , generating VBO , Loading Shaders to build scene , Colour code model , Audio . These things were Done by Pulkit .[Libraries in focus : libao , mpg123]
- Keypresses , Rendering Scenes , Making Models , Handling Sprites (Sprites include , tiles , switches , points ,bridges etc) , Handling translations , Making the shapes by making vertex Buffer and Colour buffer (Shapes include Cube , Circle and square) , Changing views using eye and lookAt , Making Presentation . These things were done by Abhishek .[Libraries in focus GLFW3 , GLAD , GLM]