QWEEBI

TAKE HOME EXERCISE - 3D APPLICATION PROGRAMMER

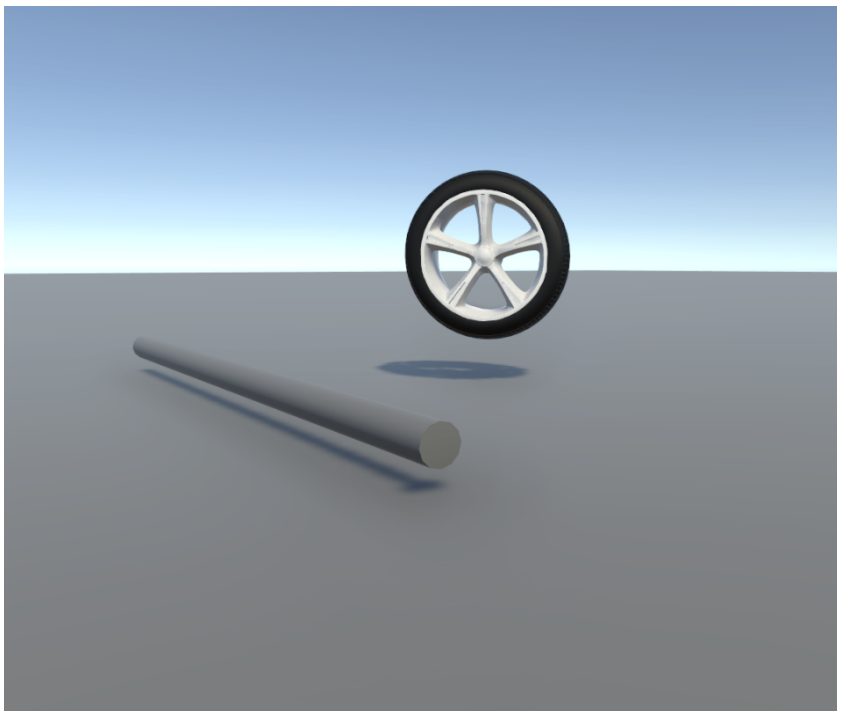
Your task is to submit a project built in Unity3D. You can use other game editors/frameworks if you are more comfortable with them, but this must be an editor that is free to download and use. Solutions submitted in non-free game engines will not be accepted.

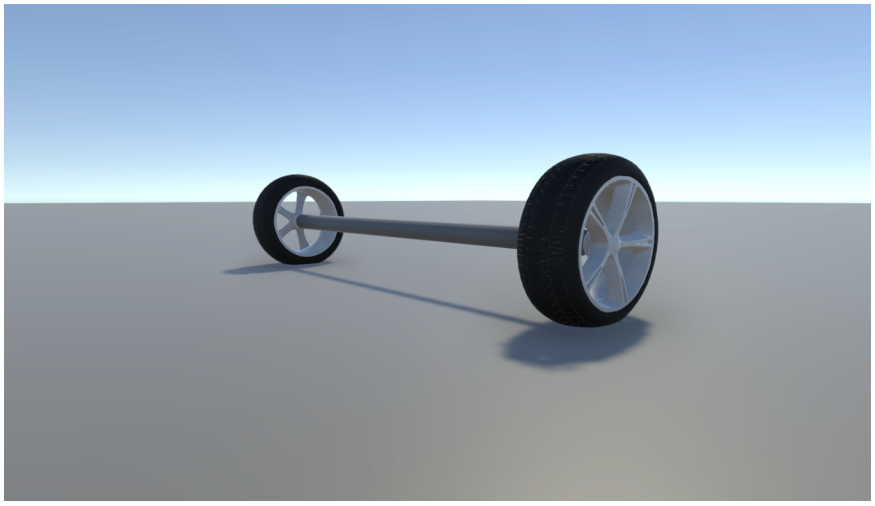
Notes:

- You are free to use any third-party plugins and libraries to complete the task. The only stipulation is that they must be licensed under non-commercial usage terms.
- The project build should be either a desktop application that can run on macOS/Windows or a browser application that can be run locally.
- If you're using Unity3D to build your application, please use version 2021.3.8. If you're using any other game engine, please link us to the documentation of the engine you're using.

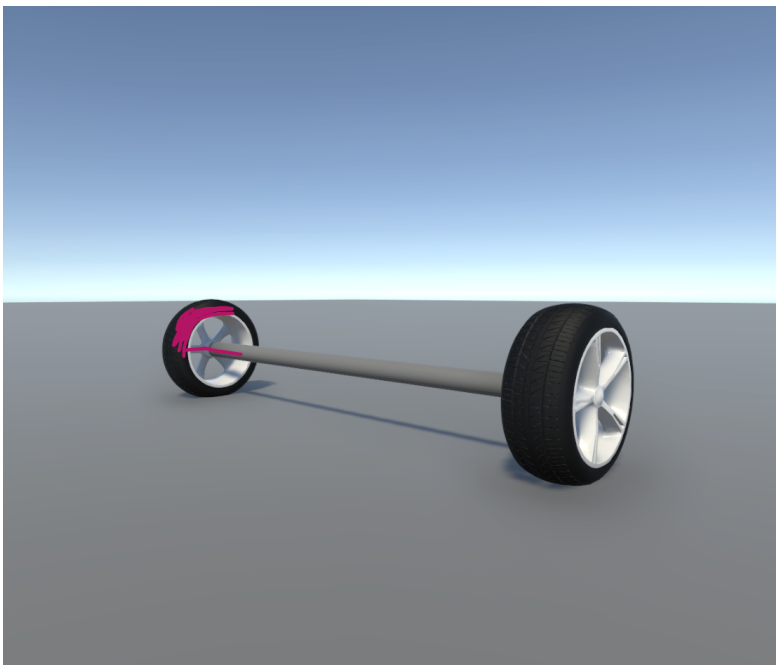
Task

1. Create a project with the following 3D assets imported into the scene:
    a. 3D Assets
2. Add the following user interactions:
    a. Add an orbital camera system that orbits around the axle. Holding down the right mouse button and dragging should control this camera.
    b. Left clicking and dragging should allow the user to select either of the two imported models in the scene and move them around.
3. When the wheel and axle are brought near together and the user releases the mouse, the following checks should be made
    a. If the end of the axle is within a certain distance from the socket on the wheel (where the axle would naturally fit), the two objects should snap together in a natural fashion (including any object transformations like rotations needed) when the left mouse button is released (object deselected).
    b. Once the objects snap together, they should be treated as a single object for any future 3D and physics operations.
    c. If the wheel is not close to the end of the axle when the object is deselected, it should be left as is.

d. 

e. 

4. Add a button that allows the user to toggle a “Paint” mode, i.e, it should support the following features while in the Paint mode.
    a. All object interactions should be disabled (Clicking and dragging).
    b. Camera controls should still be functional.
    c. Clicking and dragging in this mode should allow the user to “paint” the 3D objects, i.e
        i. Clicking and dragging should create a visible trail on the surface of the 3D model. This trail should be in 3D space on the surface of the model.
        ii. When painting the composite model of the axle and the wheel, the paint should continue naturally across both the axle and wheel as the user paints, without needing to start a new paint interaction.
        iii. It is NOT necessary to provide a color selection to the user, any colour which will be visible on the surface of the 3D model will suffice.

iv. 

5. Once this is complete, you can send us the project via either of these methods:
    a. Compress the project as a ZIP file and send it across to us via a file-sharing software like Google Drive or Dropbox.
    b. Publish the project to a version control software like GitHub and give us access to it.