**University of Petroleum and Energy Studies**

School of Computer Science

Department of Cybernetics

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**GRAPHICS AND ANIMATION TOOLS PROJECT**

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Submitted To- Submitted By-

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**Google Drive link**

<https://drive.google.com/drive/folders/1cQdmrX4_aaWvVLW5Dk9flVoyZRRaFJX8?usp=sharing>

**Project Name - Rigid Body Animation (Wrecking Ball)**

**About Blender’s Rigid Body Simulation**

*“The rigid body simulation can be used to simulate the motion of solid objects. It affects the position and orientation of objects and does not deform them.*

*Unlike the other simulations in Blender, the rigid body simulation works closer with the animation system. This means that rigid bodies can be used like regular objects and be part of parent-child relationships, animation constraints and drivers.”*

**Steps to create Wrecking Ball project using Blender’s Rigid Body Simulation -**

1. Start by creating a new project and clearing out the default cube that appears.
2. Now, click SHIFT + A, and add a torus. Rotate the torus using R+X+90 to get its front view.
3. Switch to wireframe view(Z key) and go to edit mode of the torus.
4. Select the upper half of the torus and move it upwards to make it look like a ring.
5. Now switch back to object mode and duplicate(SHIFT + D) the torus and move it up.
6. Rotate the 2nd torus by 90 degree(R+X+90) to look like 2 rings forming a chain.
7. Now select both the toruses and SHIFT + D as in step 5.
8. Now do SHIFT + R to repeat step 7 and form a chain of desired length.
9. Click on any of torus and go to Physics -> Rigid Body. Here set the weight of torus to 4kg and change the shape to mesh.
10. Now let the above torus be selected and select all the rest of toruses.
11. Click F3 and search COPY RIGID, you’ll see Copy Rigid Body Settings. This will copy the properties of torus set in Step 9 to all other toruses.
12. Now select the top most torus and set its type to PASSIVE. This will make the top most torus fixed and rest others free to move , like hanging on the top one.
13. Add a plane as the base and adjust the chain accordingly. Set the type of the plane to PASSIVE so that other objects don’t fall through it.
14. Now select the lowest torus and go to edit mode.
15. Clip off the bottom half of this torus(faces of the torus). Add a UV Sphere attached to this half torus. Set the weight of the sphere.
16. Switch back to Object Mode and set the whole hanging ball(toruses and sphere) to a position such that it looks like hanging to one side.
17. Add a cube and place it over the base plane.
18. Select the cube , go to Modifier Tab, and add an Array.
19. Set the offset of the cube and count as required.
20. Duplicate this array to other directions to make a bunch of cubes.
21. Place these cubes such that the ball collides with it.
22. Now , select all the cubes , click F3 , search for SEPARATE and separate by Loose Pairs. This way each cube will be a separate mesh.
23. Select all the cubes, click F3 , search for set origin and select Origin to Geometry.
24. Now set the weight of all the cubes as we did for the toruses.
25. Click on the play button and the Wrecking Ball showing Rigid Body Animation is ready.

