COMP 382 Project B

This project requires you to implement a Java3D environment in various stages. You are welcome to reuse MyOwn3D code from assignment 1 and assignment 2.

Stage 1	Create a scene: • Create a 3D environment of an abstract room (Cube) • Set textures to the room such that all walls have the same texture(ie. Stones), and each of ceiling and floor have appropriate textures (ie. Grass and Clouds). • Divide the room into grids such that each side is an 20x20 grid.
Stage 2	Create a character: • Create a solid sphere. • Give it a texture so that you may have a future indication of future motions. (i.e. packman, beach ball) • Place this 3D object at the centre of the floor in the room. • This "ball" should be on the floor not in or floating over it.
Stage 3	Set the camera: • Set the Camera/View to in middle of 1 wall, 2/3 of the way up the wall and at 45 degrees looking down. • The camera is stationary, all future moves are with relation of the angle to the base of the camera.
Stage 4	Camera motion: • Capture mouse motion such that when the mouse moves to the left or right, the camera looks to the left or right respectively. • Capture mouse motion such that when the mouse moves to the up or down, the camera looks to the up or down respectively. • Capture mouse wheel motion such that rolling forward or backward will zoom in or out respectively.

Stage 5	Object motion:
	• Capture key presses such that such pressing predefined keys moves the character object around the room:
	  ○ All of right arrow, numkey 6, L or D keys: move to right.
	  ○ All of left arrow, numkey 4, J or A keys: move to left.
	  ○ All of up arrow, numkey 8, I or W keys: move to forward.
	  ○ All of down arrow, numkey 2, Z or M keys: move to backward.

Stage 6	Obstacles: • Create a textured object "small cube" somewhere on the floor in the room. (i.e brick) • Adjust your code such that the character cannot cross the object and stops when touching it. • Adjust your code such that the character cannot go through the walls and stops moving when touching a ball.

Stage 7	Object interaction: • Create a 2nd textured sphere (ie. a soccer ball) and modify your code so that your character can move this object. • The object must comply with the same rules as your character such that when facing an obstacle or wall it stops.
Stage 8	Realism simulation: • Modify your code such that when the movable object made in Stage 7 moves, it rolls/rotates in the same direction of motion. • Modify your code such that when your character changes direction, its perceived face points to the direction of motion.
Stage 9	Newtonian laws: • Capture keypress on SpaceBar so that when pressed your character moves up one 2 blocks in the air at the rate of 1.5 and returns to the ground at a rate of 0.98 • Modify your code so that when your character bounces back up to 90% of its last highest height and returns to the ground. This should continue until the bounce value decreases to that of 10% of original bounce value (height of first jump)
Stage 10	Beautification (optional): • Add audio elements to the project (i.e. background music, bounce sounds) • Add a rain effect by creating random small/tiny sphere to drop from the sky/ceiling and mark the ground as they touch the floor of the room. • Add an awning side of 2x3 blocks attached and half way up one wall. Rain drops must not go through this object. • Modify your code such that when moving on the ground or moving an object around either or both of the character and movable object experience friction or slippage. • Modify the code so that when the ball object rolls, it continues to roll till it hits an obstacle; When confronted with an object, it should then move in the opposite direction; Next add a friction factor for the ground so that that the balls movement slows by the friction factor (10%) until it eventually stops.

Note: All BlueJ Mile extension files are in the Project-B directory.