My unit tests verified the collision physics with solid objects containing convex polygon “wireframes”. I tested head-on collisions as well as “indirect” collisions where some of the player’s velocity is preserved in the direction parallel with the side of the object the player collided with. My code verifies that basic collisions work, as the player is stopped in only the direction that would cause them to collide with the object.

In testZeroVelocityAfterDirectCollision(), the program applies a constant force to the player object after placing a solid wall immediately left of the player. The force matches that which would be applied when the player holds down A during a game. The game’s physics is then updated 10,000 times, and the player’s velocity is measured and verified to be 0. So, the player collided with the object and could not pass it.

In testSlidesAfterPartialCollision(), the program creates a vertical line of walls, and places the player to the right of it. A large but temporary leftwards and downwards force is applied to the player object. The game’s physics is then updated 500 times, and the player’s x and y position are measured to be underneath where it started yet immediately to the right of the wall. So, the player slid downwards, parallel in the direction of the wall and in the direction of the applied force.