Bouncy Balls Requirements

1. Required

1. The assignment is written in Java (for ease of grading).
2. A rectangle window represents the 'room' in which the balls bounces.
3. The edges of the rectangle windows are "walls". Balls will bounce after hitting the wall.
4. Balls will also bounce after hitting each other and the mouse cursor.
5. 'Balls' are colored 2d circles.
6. Gravity is present in the room so that the balls naturally fall downward. 1/2 or 1/4 earth gravity may be used (for a more pleasing viewing experience).
7. Time may be slowed. 1s in the real world = 0.1s in-game.
8. 10% of the energy may be lost (in heat) in the 'bounce' and the rest 90% is converted back into kinetic energy. The percentage may change for a more pleasing viewing experience.
9. A black ball controlled by the mouse cursor can 'push' other balls.
10. At the start of the 'game', balls are shoot into the 'room' from the upper left corner with random initial speed and angle.

2. Optional

1. Physical constants could be changed in the settings (including gravitational constant, time, energy loss).
2. An upside-down mode where gravity is suddenly inverted, causing all balls to 'fall' to the ceiling.
3. At the start of the game, a window prompts the user the to-be-compiled code name and executes the compilation command for the user.
4. Ability to add and remove balls to the room.
5. Balls change color when bouncy.
6. Any other additional entertaining features.