

Lab 3 – Time

1. Building on the work from last week, as you will need the input class for some of the tasks. First, start by adding in the calculation for delta time to the main.cpp and passing it as a parameter into the game class's update() and handleInput() functions.

```
// Calculate delta time. How much time has passed since it was last
// calculated (in seconds) and restart the clock.
deltaTime = clock.restart().asSeconds();
// Call standard game loop functions (input, update and render)
game.handleInput(deltaTime);
game.update(deltaTime);
game.render();
```

In the Game class create an object (rectangle or circle) that automatically moves across the screen using delta time. To do this, update the objects position in the update() function, similar to the example given in the lecture, the object moving positive along the x-axis.

2. Make the shape bounce backwards and forwards, bouncing when it reaches the edge of the window. The object should be given an initial direction of movement and rebound off the edges of the window and continue moving. For example, a start position of 100, 100, moving positively along the x-axis. Once it reaches the edge of the window its direction changes and it moves negatively along the x-axis (going back the way it came). This will require you to check the objects position against the size of the window.
3. Create another shape that moves (with delta time) based on keyboard controls. Up, down, left and right arrows move the shape around the window. Again this shape must not move outside the window.
4. Create a third shape that bounces around the window in 4 directions (rather than just back and forth like the previous shape).
5. Once the shape bounces around the screen automatically, add keyboard controls to increase and decrease the speed the shape moves. For example, pressing "+" increases the speed the shape is moving and pressing "-" decreases the speed.