# project 12: reactive behavior programming

### task 12.1: a simple controller for breakout

Breakout is a classical arcade game where players basically have to react to the current game state. Implementing artificial agents which can play breakout should therefore be straightforward . . .

Implement a controller for the breakout game of your choice. That is, write a function that controls how the paddle has move in order to hit the ball.

Since this task poses a rather trivial problem, let's make the overall setting more interesting: modify the code of your breakout implementation such that the speed of the ball increases over time and see how your paddle agent copes with this.

In any case, explain what characterizes game states and actions in breakout. Which game entity attributes have to be considered to realize an autonomous agent for breakout?

### task 12.2: a finite state machine for breakout

Proceed as above but, this time, formalize and implement your breakout controller as a finite state machine. That is, think about what states the paddle could be in and which observations as to the current overall game state should trigger what kinds of transitions from one paddle state to the other.

**Note:** there is no single best solution for this task. Different people will likely come up with different state spaces for an artificial breakout agent. Just think about a reasonable model and then realize behavior in terms of a state transition function.