Sample game description

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When writing your description it is useful to think of the game as a robot which manipulates a collection of objects. Each time an event occurs (user input, timer event etc) the robot changes the state of objects and updates the image on the screen. Each object has properties defined by a set of fixed parameters, a changing state (e.g. position and velocity) and knobs and buttons for changing this state (actions).

The game description should contain the following elements:

- The overall description of the game. This description has to be sufficiently detailed: all objects must be introduced and described, and their behavior defined.

- The list of objects; for each object it is usually convenient to specify fixed parameters needed to create an object of this type, the state, that is, the list of object parameters that may change (e.g. position) and actions that can be performed on (or by) the object.

- A description of game controls and how these controls change the state.

These descriptions are intended as a foundation for designing C++ classes implementing various objects.

Game description. Two players play the game. Each player controls the vertical motion of a paddle (represented by a rectangle) on the screen using two keys on the keyboard. A ball starts in the center of the screen and initially moves in a random direction. When the ball reaches a wall or a paddle, it bounces. If the left wall is reached, the right player scores a point; if the right wall is reached, the left player scores a point.

Objects.

Ball. *Fixed parameters*: initial velocity, initial position, radius, color.

State: position, velocity.

Actions: draw, check for intersection with a line segment or rectangle, change velocity for a bounce.

Paddle. *Fixed parameters*: up/down control keys, color, vertical size, horizontal size, horizontal position, vertical speed.

    State: vertical position, motion on/off.

    Actions: draw, start motion up/down, stop motion.

Court. *Fixed parameters*: vertical and horizontal dimensions, screen position, color.
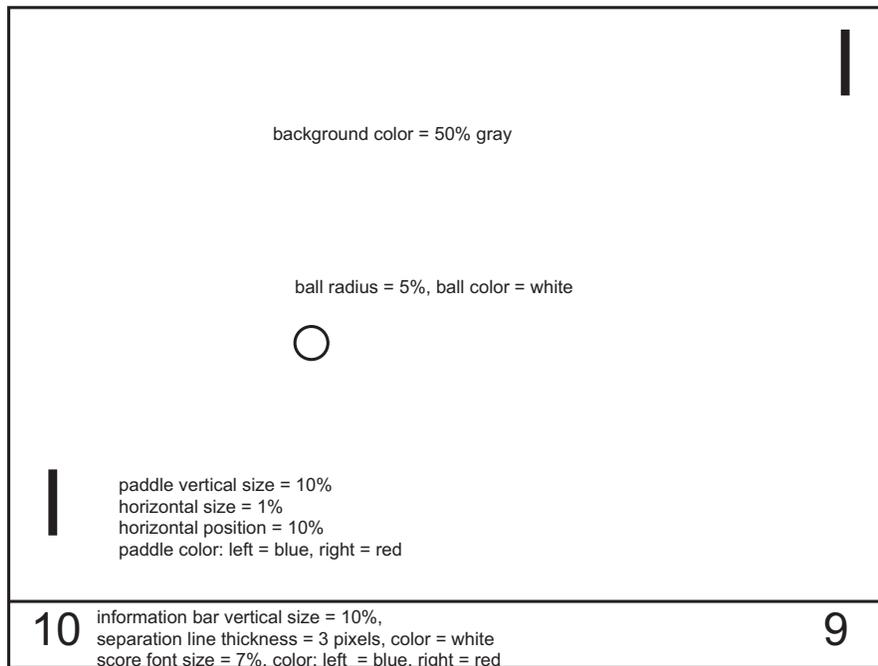
    Actions: draw.

Information board. *Fixed parameters*: vertical and horizontal dimensions, screen position, font name, font size, score horizontal offset.

    State: left and right scores.

    Actions: draw, increment score for left/right.

Screen layout. The following image shows relative dimensions (in percentages of the vertical size) of various screen objects.

background color = 50% gray

ball radius = 5%, ball color = white

paddle vertical size = 10%
horizontal size = 1%
horizontal position = 10%
paddle color: left = blue, right = red

10   information bar vertical size = 10%,
separation line thickness = 3 pixels, color = white
score font size = 7%, color: left = blue, right = red   9

Game control.   The left players uses keys "a" and "z" to move the paddle, the right player uses the quote and question mark keys. Once a key is pressed the motion of the paddle starts, and does not stop until the key is released.

   If the key "q" is pressed, the game is terminated. If the key "r" is pressed the game is restarted. If the key "p" is pressed, the game is stopped: the ball does not move and the paddles cannot be moved. If the key "p" is pressed again, the game is resumed.