Move the monster with keyboard and mouse

MAKE THE MONSTER MOVE USING THE ARROW KEYS, AND INCREASE ITS SPEED BY PRESSING A MOUSE BUTTON

To conclude this section about events, we will now use the arrow keys to move the monster from the previous examples up/down/left/right and make it speed up when we press a mouse button while it moves. Notice that pressing two keys at the same time makes it move diagonally.

Check this online example at JSBin: we only changed a few lines of code from the previous lesson's example.

We first added a JavaScript object to describe the monster:

```
// The monster!
var monster = {
  x:10,
  y:10,
  speed:1
 };
```

Where `monster.x` and `monster.y` define the monster's current position, and `monster.speed` corresponds to the number of pixels we will move the monster vertically or horizontally between each frame of animation (when an arrow key is pressed).

Note: this is not the best way to animate objects in a game; we will look at a far better solution - *"time based animation"* - in another lesson.

We modified the game loop as follows:

```
var mainLoop = function(time){
  // Main function, called each frame
  measureFPS(time);
  // Clears the canvas
  clearCanvas();
  // Draws the monster
  drawMyMonster(monster.x, monster.y);

  // Checks inputs and moves the monster
  updateMonsterPosition();
  // Calls the animation loop every 1/60th of second
  requestAnimationFrame(mainLoop);
};
```

We moved all the parts that check the input states in the`updateMonsterPosition()` function:

```
function updateMonsterPosition() {
  monster.speedX = monster.speedY = 0;
  // Checks inputStates
  if (inputStates.left) {
    ctx.fillText("left", 150, 20);
    monster.speedX = -monster.speed;
  }
  if (inputStates.up) {
    ctx.fillText("up", 150, 40);
    monster.speedY = -monster.speed;
  }
  if (inputStates.right) {
    ctx.fillText("right", 150, 60);
    monster.speedX = monster.speed;
  }
  if (inputStates.down) {
    ctx.fillText("down", 150, 80);
    monster.speedY = monster.speed;
  }
  if (inputStates.space) {
```

```
      ctx.fillText("space bar", 140, 100);
    }
    if (inputStates.mousePos) {
      ctx.fillText("x = " +inputStates.mousePos.x + " y = " +
                              inputStates.mousePos.y, 5, 150);
    }
    if (inputStates.mousedown) {
      ctx.fillText("mousedown
b" +inputStates.mouseButton, 5, 180);
      monster.speed = 5;
    } else {
    // Mouse up
    monster.speed = 1;
    }
    monster.x += monster.speedX;
    monster.y += monster.speedY;
  }
```

Explanations:

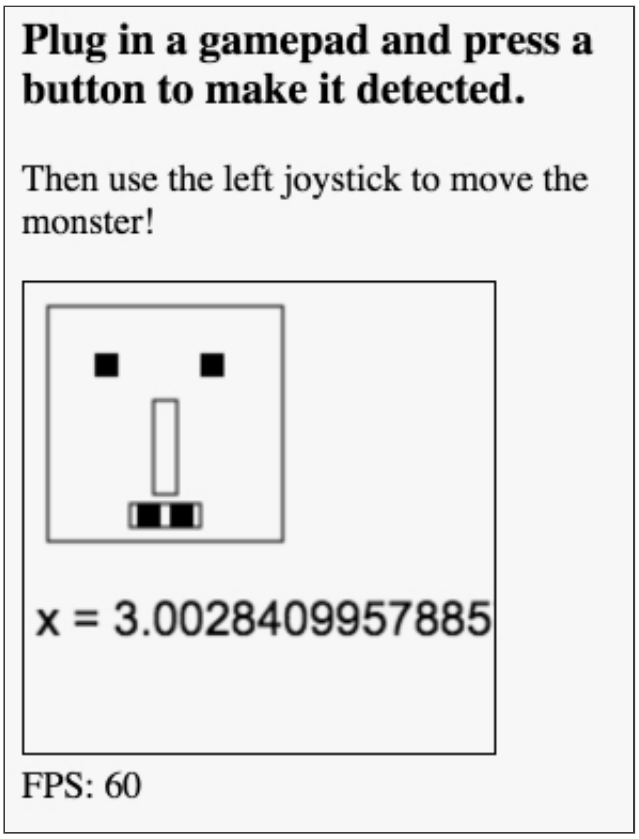
- In this function we added two properties on the fly to the`monster` object: `speedX` and `speedY` that will correspond to the number of pixels we will add to the `x` and `y` position of the monster at each new frame of animation.
- We first set these to zero (*line 2*), then depending on the keyboard input states, we set them to a value equal to`monster.speed` or `-monster.speed` depending on the keys that are being pressed (*lines 4-20*).
- Finally, we add `speedX` and `speedY` pixels to the `x` and/or `y`position of the monster (*lines 36 and 37*).
- As the function is called by the game loop, if `speedX` and/or`speedY` are different from zero, this will change the `x` and `y`position of the monster every frame, making it move smoothly.
- If a mouse button is pressed or released we set the`monster.speed` value to `+5` or to `+1`. This will make the monster move faster when a mouse button is down, and return to its normal speed when no button is down.

Notice that two arrow keys can be pressed at once + the mouse down at the same time. In this situation, the monster will take a diagonal direction + speed up. This is why it is important to keep all the input states up to date, and not handle single events individually, like we did in week 4 of the HTML5 Part 1 course.

TAKING INTO ACCOUNT THE GAMEPAD

We added the gamepad utility functions from the previous lesson (we cleaned them a bit too, removing all the code for displaying the progress bars, buttons, etc.), added a `gamepad` property to the game framework, and added one new call in the game loop for updating the gamepad status.

Check the result on JSBin:



The new updated `mainloop`:

```
var mainLoop = function(time){
   //main function, called each frame
```

```
    measureFPS(time);
    // Clear the canvas
    clearCanvas();
    // gamepad
    updateGamePadStatus();

    // draw the monster
    drawMyMonster(monster.x, monster.y);
    // Check inputs and move the monster
    updateMonsterPosition();
    // Call the animation loop every 1/60th of second
    requestAnimationFrame(mainLoop);
};
```

And here is the updateGamePadStatus function (the function calls inside are to the gamepad utility functions detailed in the previous lesson):

```
function updateGamePadStatus() {
  // get new snapshot of the gamepad properties
  scangamepads();
  // Check gamepad button states
  checkButtons(gamepad);
  // Check joysticks
  checkAxes(gamepad);
}
```

The `checkAxes` function updates the `left, right, up, down` properties of the `inputStates` object we already used with key events. Therefore, without changing any line of code in the`updatePlayerPosition` function, the monster moves.