# Web Programming

LAB4: MAZE (JAVASCRIPT DOM AND EVENT)

# Basic lab instructions

◦ You may want to *bring your slides* to labs to look up syntax and examples.

◦ Have a question? *Ask a TA* for help, or look at the lecture slides.

◦ We encourage you to *talk to your classmates*; it's okay to share code and ideas during lab.

◦ You don't have to finish all of the exercises. Just do as much as you can in the allotted time. You don't need to finish the rest after you leave the lab; there is no homework from lab.

# Today's lab exercises

This lab practices unobtrusive JavaScript events and the Document Object Model (DOM). We'll write a page with a "**maze**" to navigate with the mouse. You will write maze.js to implement the maze behavior.
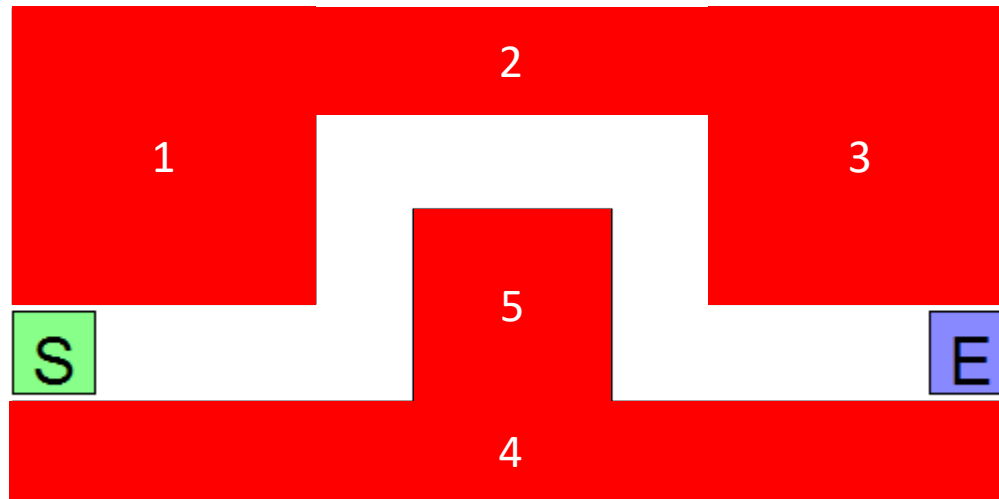
# Info about the maze

**To start, download the files maze.html and maze.css from the server. (from Samba\...\lab4-src)**

The difficult is in having the dexterity to move the mouse through **without touching any walls**. When the mouse cursor touches a wall, all walls turn red and a "You loss" message shows. Touching the Start button with the mouse removes the red coloring from the walls.

The maze walls are 5 div elements. Our provided CSS puts the divs into their proper places.

```
<div id="maze">
    <div id="start">S</div>
    <div class="boundary" id="boundary1"></div>
    <div class="boundary"></div>
    <div class="boundary"></div>
    <div class="boundary"></div>
    <div class="boundary"></div>
    <div id="end">E</div>
  </div>
```
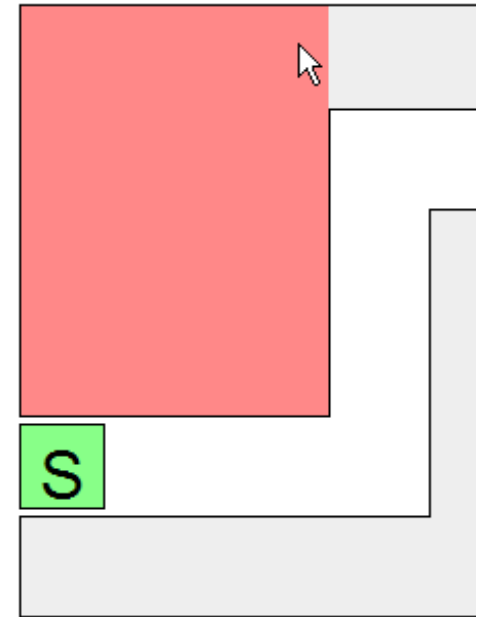
# Exercise 1:
# Single boundary turns red (~15 min)

Write code so that when the user moves the mouse onto a single one of the maze's walls (onmouseover), that wall will **turn red**. Use the top-left wall; it is easier because it has an id of boundary1.

1. Write your JS code unobtrusively, without modifying maze.html.

2. Write a window.onload handler that sets up any event handlers.

3. Handle the event on the wall by making it red.

4. Turn the wall red by setting it to have the provided CSS class youlose, using the classList property.
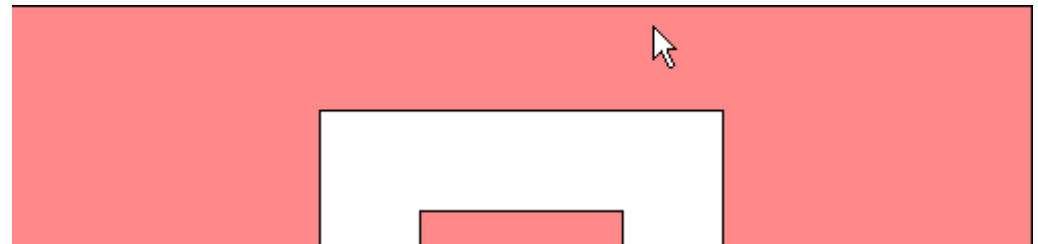
# Exercise 2:
# All boundaries glow red on hover (~10 min)

Make it so that all maze walls turn red when the mouse enters any one of them.

1. You'll need to attach an event handler to each div that represents a wall of the maze.

2. It is harder to select all of these divs, since they do not have id attributes.

3. But they do all have a class of boundary. Use the **document.querySelectorAll** function to access them all.
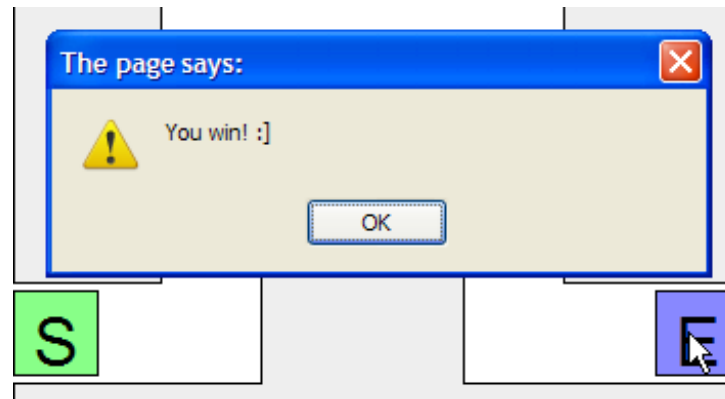
# Exercise 3:
# Alert on completion of maze (~10 min)

Make it so that if the user reaches the end of the maze, a "You win!" alert message appears.

1.  The end of the maze is a div with an id of end.

2.  Don't pop up "You win!" unless the user makes it to the end without touching any walls.

3.  Keep track of whether any walls were hit, so you'll know what to do when the end square is hit.

# Exercise 4: Restartable maze (~10min)

Make it so that when the user clicks the mouse on the Start square (a div with an id of start), the maze state will reset. That is, if the maze boundary walls are red, they will all return to their normal color, so that the user can try to get through the maze again.

You'll need to use the **document.querySelectorAll** function again to select all of the squares to set their color.
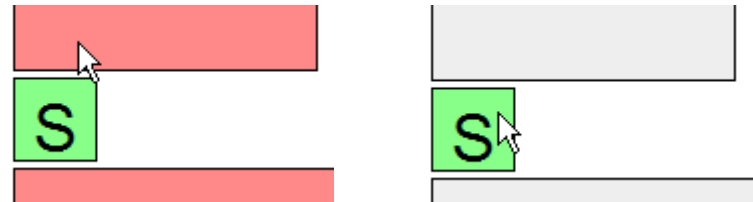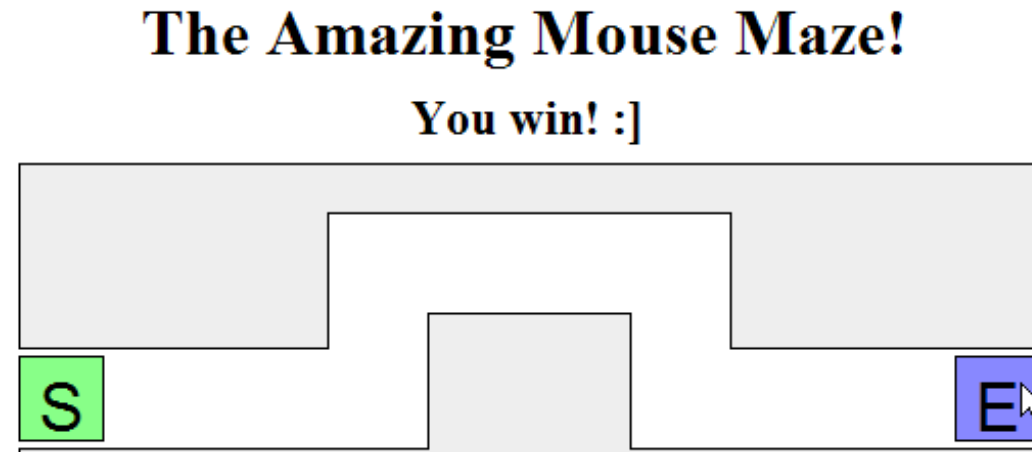
# Exercise 5:
# On-page status updates (~10 min)

Instead of an alert, make the "You win" and "You lose" messages appear **in the page** itself.

The page has an (initial empty) h2 element on the page with an id of status. Put the win/lose text into that div when the user finishes the maze.
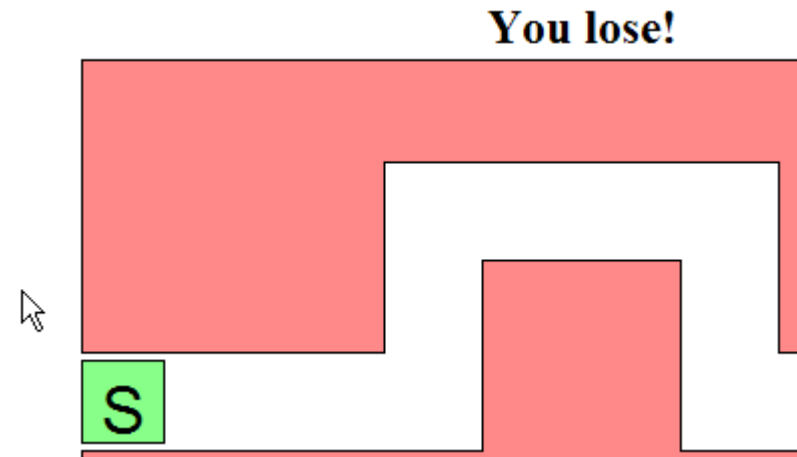
# Exercise 6: Disallow cheating

It's too easy to cheat: Just move your mouse around the outside of the maze!

Fix this by making it so that if the user moves the mouse anywhere outside the maze after clicking the Start area, the walls will light up red and the player will lose the game.

To do this, you'll need to listen to other kinds of mouse events on other elements.
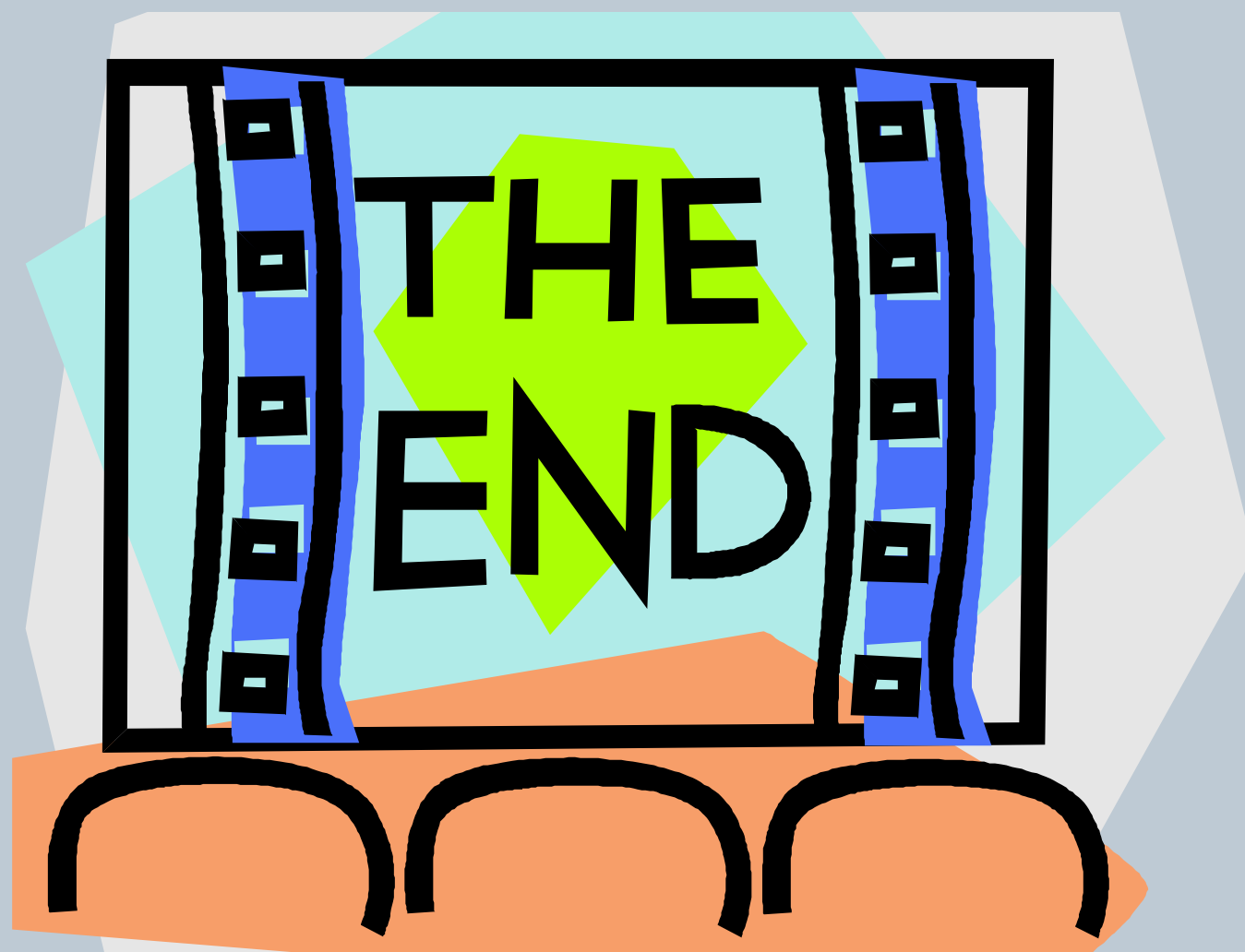
# If you finish them all...

If you finish all the exercises, you can add any other content or code you like to your page.

If the lab is over or almost over, check with a TA and you may be able to be dismissed.

Once the lab time is up, you may stop working. You don't need to complete the remaining exercises unless you want to for fun.

**Great work!**

Thank you for your attention!