Names: _____

## Writing Conditions

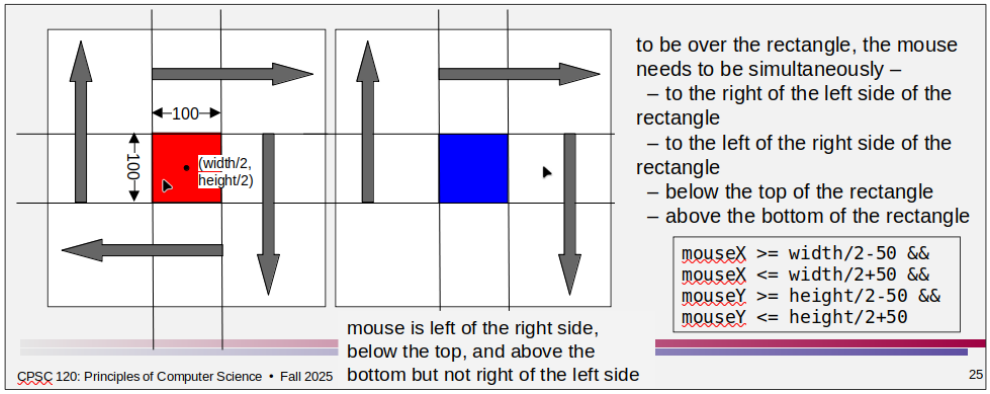
Conditions are *boolean expressions* – something which evaluates to true or false.

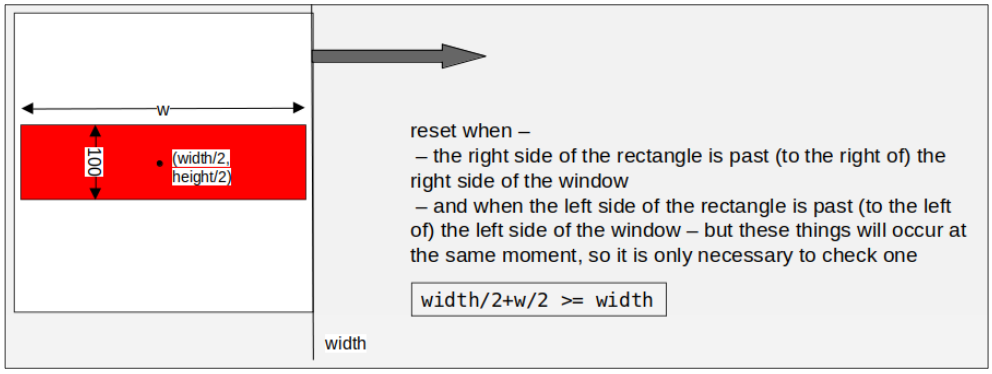
Tools –

- *relational operators* ==, !=, <, <=, >, >= for comparing two values
- *logical operators* &&, ||, ! for combining simple conditions into more complex conditions

| A | B | !A | A && B | A \|\| B |
|---|---|---|---|---|
| T | T | F | T | T |
| T | F | F | F | T |
| F | T | T | F | T |
| F | F | T | F | F |

&& – both parts must be true for the whole condition to be true
|| – only one part needs to be true for the whole condition to be true



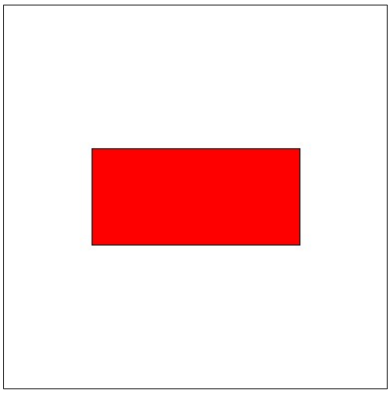

## At the End of Class

Hand in this worksheet at the end of class, even if you haven't finished everything.

## Exercises

For each exercise on the following pages, answer "when does each alternative occur?" in words and label the picture to help you figure out the condition. Choose reasonable values for any values you need that aren't provided.

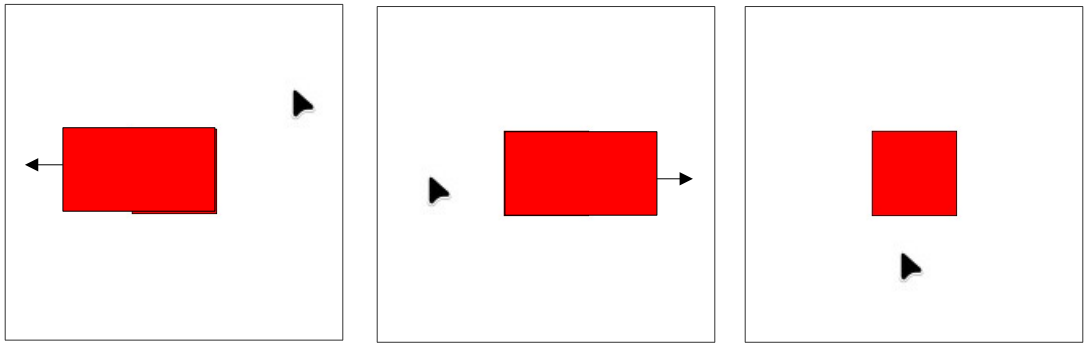
1. A sketch contains a rectangle whose width grows until it reaches the edges of the window, then its height grows. Once the rectangle reaches the top/bottom of the window, both width and height reset to 100 and the animation repeats.



| **what are the alternatives?** | **when does each alternative occur?** | **condition** |
|---|---|---|
| grow width | | |
| grow height | otherwise | n/a – else |

| **what are the alternatives?** | **when does each alternative occur?** | **condition** |
|---|---|---|
| reset | | |
| don’t reset | otherwise | n/a – do nothing case |

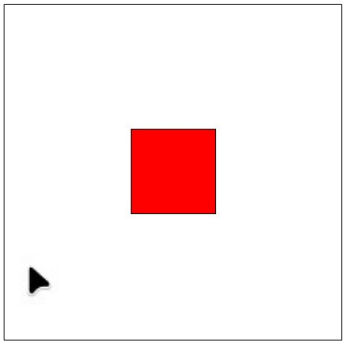
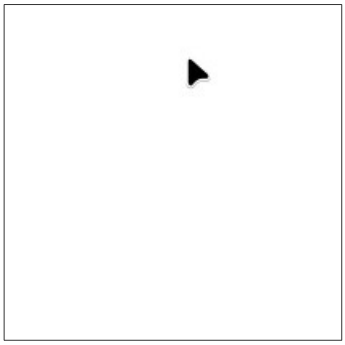
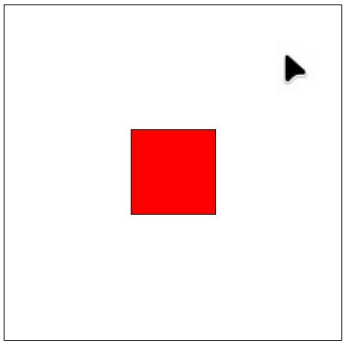
2. A sketch contains a rectangle which is initially 100x100 and centered in the window. The rectangle grows to the left (the left edge moves left) when the mouse is in the right third of the window, grows to the right (the right edge moves right) when the mouse is in the left third of the window, and doesn't change when the mouse is in the middle of the window.



| **what are the alternatives?** | **when does each alternative occur?** | **condition** |
|---|---|---|
| grow to the left | | |
| grow to the right | | |
| don't grow | otherwise | n/a – do nothing case |

3. A sketch contains a rectangle that disappears if the mouse gets within 100 pixels horizontally of the center of the window. The drawing window is 400x400.

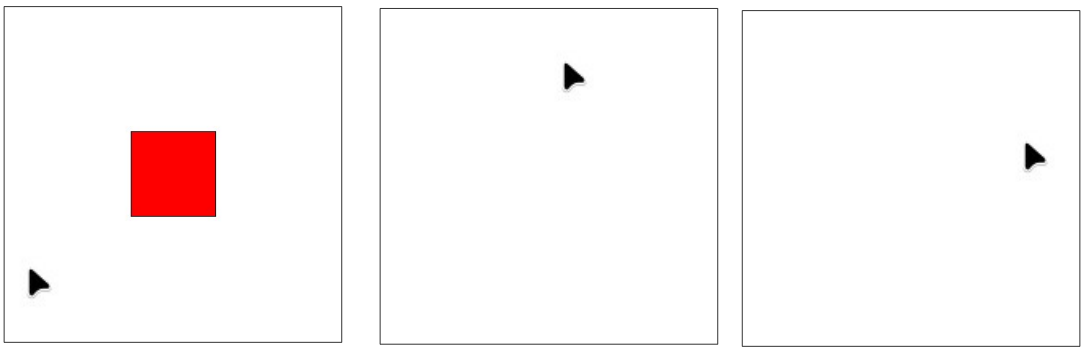
   Hint: think about the opposite condition – when not to draw the rectangle – and then use "not" (!) i.e. draw the rectangle when it is not the time not to draw the rectangle.

| **what are the alternatives?** | **when does each alternative occur?** | **condition** |
|---|---|---|
| draw rect | | |
| don't draw rect | otherwise | n/a – do nothing case |

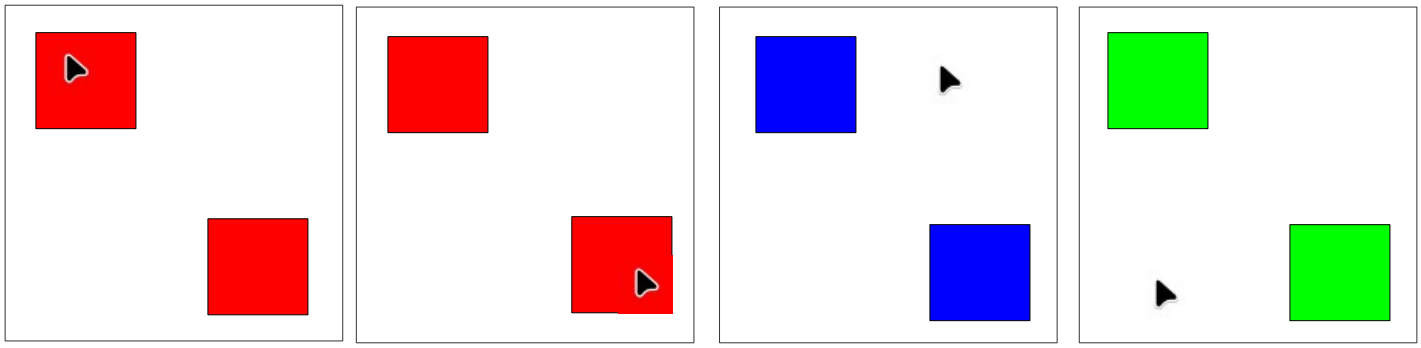
4. A sketch contains a rectangle that disappears if the mouse gets within 100 pixels horizontally or vertically of the center of the window. The drawing window is 400x400.

   Hint: think about the opposite condition – when not to draw the rectangle – and use "not" (!).



| **what are the alternatives?** | **when does each alternative occur?** | **condition** |
|---|---|---|
| draw rect | | |
| don't draw rect | otherwise | n/a – do nothing case |

5. A sketch contains two 100x100 rectangles positioned as shown in a 400x400 drawing window. Both rectangles are red if the mouse is over either rectangle, otherwise they are blue if the mouse is in the top half of the window and green if the mouse is in the bottom half of the window.



| **what are the alternatives?** | **when does each alternative occur?** | **condition** |
|---|---|---|
| red rects | | |
| blue rects | | |
| green rects | otherwise | else |