Names: _____

Conditionals Questions

- Does something happen differently at different times, or only happen sometimes?

  → if so, need conditionals

- What are the alternatives?
- How do we decide between them?
  - *on-the-spot* – focus is on how to decide in the moment
    - decision about which alternative is based only on the current *value of animation or system variable(s)*
  - *prior happenings* – focus is on when the change in behavior occurs
    - decision about which alternative depends on prior events / what has been going on

On-the-spot decisions –

- Is “do nothing” an option?
- When does each alternative occur?

Prior happenings decisions –

- What is the decision about?
- How many alternatives are there?
- Is “do nothing” an option?
- Which alternative do we start with?
- For each alternative, when do we change to that alternative?

At the End of Class

Hand in this handout.

Exercises

1. A sketch contains a 100x100 rectangle centered in the drawing window. The rectangle should be outlined in black, and should be filled red when the mouse is over it and blue otherwise.

	what happens differently, or only sometimes?	the color of the rectangle – sometimes red, sometimes blue
	what are the alternatives?	red or blue
	how do we decide between them?	mouse position over the rectangle or not – based on the mouse position
	on the spot or prior happenings?	on the spot – look at the mouse position to know the color
on-the-spot	is “do nothing” an option?	no, the rectangle must have a color
	when does each alternative occur?	red when the mouse is over the rectangle, blue otherwise
prior happenings	what is the decision about?	
	how many alternatives are there?	
	is “do nothing” an option?	
	which alternative do we start with?	
	For each alternative, when do we change to that alternative?	

2. A sketch contains a 100x100 rectangle centered in the drawing window. The rectangle should grow in width when the mouse is over the rectangle, and should reset to 100 when it reaches the edge of the window. (The rectangle should remain centered in the window.)

	what happens differently, or only sometimes?	rectangle grows wider, or it doesn't	rectangle size rests, or it doesn't
	what are the alternatives?	grow or not	reset or not
	how do we decide between them?	when the mouse is over the rectangle – based on mouse position	reset when the sides of the rectangle reach the sides of the window
	on the spot or prior happenings?	on the spot – can just look at the mouse position	on the spot – can just look at the current width and the window size
on-the-spot	is "do nothing" an option?	yes – grow or not	yes – only reset at the edge of the window
	when does each alternative occur?	grow when the mouse is over the rectangle, do nothing otherwise	reset when the sides of the rectangle reach the sides of the window
prior happenings	what is the decision about?		
	how many alternatives are there?		
	is "do nothing" an option?		
	which alternative do we start with?		
	For each alternative, when do we change to that alternative?		

3. A sketch contains an ellipse which grows steadily. Clicking the mouse should pause and unpause the animation so that sometimes the ellipse grows and sometimes it doesn't.

	what happens differently, or only sometimes?	pause and unpause – sometimes the animation is updating, sometimes it ins't
	what are the alternatives?	paused or not paused
	how do we decide between them?	based on mouse clicks – requires knowledge of prior happeneings
	on the spot or prior happenings?	prior happenings
on-the-spot	is "do nothing" an option?	
	when does each alternative occur?	
prior happenings	what is the decision about?	whether the animation is paused or not
	how many alternatives are there?	two – paused, not paused
	is "do nothing" an option?	no, the sketch is either paused or running – though "paused" means not updating, so this could also be thought of as "run or don't run"
	which alternative do we start with?	presumably running
	For each alternative, when do we change to that alternative?	running → mouse click → paused → mouse click → running

4. 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 0 and the animation repeats.

	what happens differently, or only sometimes?	sometimes the width grows, sometimes the height grows	reset or not
	what are the alternatives?	width grows or height grows	reset or not
	how do we decide between them?	height grows once the width has reached the edge of the window	reset when the height reaches the top/bottom of the window
	on the spot or prior happenings?	can be on the spot – can look at the width to determine if the width or height should grow	on the spot – can look at the height to determine whether to reset
on-the-spot	is “do nothing” an option?	not really – the height stops growing when it gets to the edge but it resets at that point so we only need to consider growing the width or growing the height	yes – reset or don’t reset
on-the-spot	when does each alternative occur?	grow width until the rectangle reaches the sides of the window, then grow height	reset when the height reaches the top/bottom of the window
prior happenings	what is the decision about?		
prior happenings	how many alternatives are there?		
prior happenings	is “do nothing” an option?		
prior happenings	which alternative do we start with?		
prior happenings	For each alternative, when do we change to that alternative?		

If you have time –

5. A sketch contains a 100x100 rectangle centered in the drawing window. The rectangle should grow in width when the mouse is moved to the right, shrink in width when the mouse is moved to the left, and not change when the mouse stays still (or moves only vertically). (Hint: in addition to system variables `mouseX` and `mouseY` for the mouse's current position, there are also system variables `pmouseX` and `pmouseY` for the mouse's previous position.)

	what happens differently, or only sometimes?	
	what are the alternatives?	
	how do we decide between them?	
	on the spot or prior happenings?	
on-the-spot	is "do nothing" an option?	
on-the-spot	when does each alternative occur?	
prior happenings	what is the decision about?	
prior happenings	how many alternatives are there?	
prior happenings	is "do nothing" an option?	
prior happenings	which alternative do we start with?	
prior happenings	For each alternative, when do we change to that alternative?	

6. A sketch contains a 100x100 rectangle centered at a random position in the drawing window. Clicking the mouse inside the rectangle should cause it to move to a new random position.

	what happens differently, or only sometimes?	
	what are the alternatives?	
	how do we decide between them?	
	on the spot or prior happenings?	
on-the-spot	is “do nothing” an option?	
	when does each alternative occur?	
prior happenings	what is the decision about?	
	how many alternatives are there?	
	is “do nothing” an option?	
	which alternative do we start with?	
	For each alternative, when do we change to that alternative?	

7. 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 0 and the animation repeats. This repeats three times before stopping.

	what happens differently, or only sometimes?		
	what are the alternatives?		
	how do we decide between them?		
	on the spot or prior happenings?		
on-the-spot	is “do nothing” an option?		
on-the-spot	when does each alternative occur?		
prior happenings	what is the decision about?		
prior happenings	how many alternatives are there?		
prior happenings	is “do nothing” an option?		
prior happenings	which alternative do we start with?		
prior happenings	For each alternative, when do we change to that alternative?		