

Making Choices – Conditionals

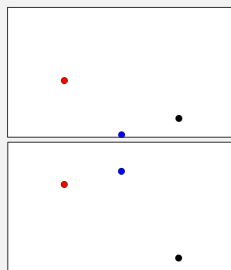
Making Choices

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

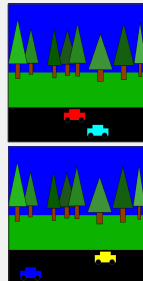
→ need *conditionals* (*if statements*)

Conditionals

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



red circle moves up
or down
blue, black circles
bounce



cars wrap when
the edge is
reached
car color –
red/yellow,
blue/cyan/green

Conditionals Questions

Questions –

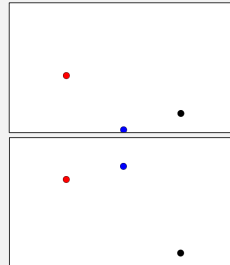
- What are the alternatives?
- How do we decide between them?

Two patterns –

- *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

Conditionals

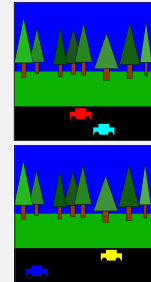
- What are the alternatives?
 - red circle: move up or move down
 - blue, black circles: bounce or don't bounce
- How do we decide between them?
 - red circle: direction of movement changes when the top or bottom of the window is reached
 - prior happenings
 - blue, black circles: bounce occurs when the bottom of the window is reached – based on y coordinate
 - on the spot



red circle moves up or down
blue, black circles bounce

Conditionals

- What are the alternatives?
 - both cars: wrap or don't wrap
 - top car: red or yellow
 - bottom car: blue, cyan, or green
- How do we decide between them?
 - both cars: wrapping occurs when the edge of the window is reached
 - on the spot
 - top car: color is determined by mouse position
 - on the spot
 - bottom car: color changes when the mouse is clicked
 - prior happenings



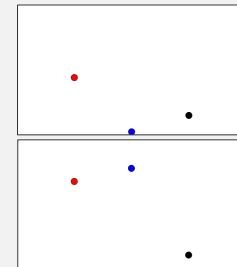
cars wrap when the edge is reached
car color – red/yellow, blue/cyan/green

On-the-Spot Decisions

decision about which alternative is based only on the current value of animation or system variable(s)

Additional questions –

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



blue, black circles bounce

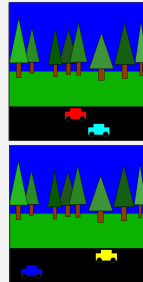
On-the-Spot Decisions

decision about which alternative is based only on the current value of animation or system variable(s)

- What are the alternatives?
 - blue, black circles: bounce or don't bounce
- Is “do nothing” an option?
 - yes (don't bounce is “do nothing”)
- When does each alternative occur?
 - bounce when the circle has reached (or passed) the bottom of the window

On-the-Spot Decisions

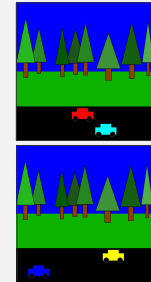
- What are the alternatives?
 - both cars: wrap or don't wrap
- Is "do nothing" an option?
 - yes (don't wrap is "do nothing")
- When does each alternative occur?
 - wrap when the top car has reached (or passed) the right side of the window
 - wrap when the bottom car has reached (or passed) the left side of the window



cars wrap when the edge is reached

On-the-Spot Decisions

- What are the alternatives?
 - top car: red or yellow
- Is "do nothing" an option?
 - no (car must be some color)
- When does each alternative occur?
 - red when the mouse is on the left side of the window, yellow when the mouse is on the right side of the window



top car color – red/yellow

Prior Happenings Decisions

decision about which alternative depends on prior events / what has been going on

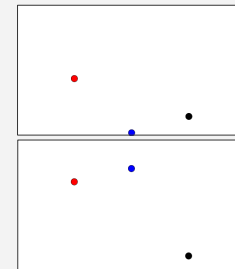
Additional questions –

- 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?

Prior Happenings Decisions

decision about which alternative depends on prior events / what has been going on

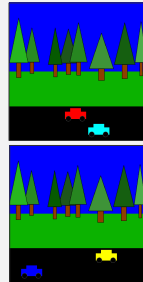
- What are the alternatives?
 - red circle: move up or move down
- What is the decision about?
 - direction of movement
- How many alternatives are there?
 - two
- Is "do nothing" an option?
 - no (red circle always moves)
- Which alternative do we start with?
 - move down
- For each alternative, when do we change to that alternative?
 - move down → reach bottom of window → move up → reach top of window → move down



red circle moves up or down

Prior Happenings Decisions

- What are the alternatives?
 - bottom car: blue, cyan, green
- What is the decision about?
 - color of the bottom car
- How many alternatives are there?
 - three
- Is “do nothing” an option?
 - no (car must have a color)
- Which alternative do we start with?
 - blue
- For each alternative, when do we change to that alternative?
 - blue → mouse click → cyan → mouse click → green → mouse click → blue



blue/cyan/green