Undetermined Repetition with While loop

October 14, 2021

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Announcements

• QZ and videos for next time
At the Raleigh Fair Grounds
Alice 2 Fair Rides as objects
Double Ferris Wheel
Alice 2 - Octopus Ride
// Ride the Octopus

// Don Slater June 19, 2008

// See Octopus animation from above

Octopus.octopusAnimation

// Move camera to one of the pods facing forward

camera set point of view to Octopus.Center.Arm3.pods more...
camera set vehicle to Octopus.Center.Arm3.pods more...

// get in the pod

camera move up .2 meters more...
camera move forward ( subject = Octopus.Center.Arm3.pods 's width / 2 ) more...

// Sit in the pod

Do together

camera turn left 0.25 revolutions more...
camera move backward 0.5 meters more...
camera turn forward 0.05 revolutions more...

// Ride the Octopus Pod

Octopus.octopusAnimation
Octopus.rideCode

<table>
<thead>
<tr>
<th>Loop 1 time</th>
<th>time</th>
<th>show complicat...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wait 2 seconds</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Do together

<table>
<thead>
<tr>
<th>Loop 6 times</th>
<th>times</th>
<th>show complicat...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do together</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Octopus.podsAnimation pods = Octopus.Center.Arm1.pods
Octopus.podsAnimation pods = Octopus.Center.Arm2.pods
Octopus.podsAnimation pods = Octopus.Center.Arm3.pods
Octopus.podsAnimation pods = Octopus.Center.Arm4.pods
Octopus.podsAnimation pods = Octopus.Center.Arm5.pods
Octopus.podsAnimation pods = Octopus.Center.Arm6.pods
Octopus.podsAnimation pods = Octopus.Center.Arm7.pods
Octopus.podsAnimation pods = Octopus.Center.Arm8.pods

<table>
<thead>
<tr>
<th>Loop 3 times</th>
<th>times</th>
<th>show complicat...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do together</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Back to Alice 3....
Looping – exact number of times

• Count loop

• How many steps to get to the panda?
  3, 6, 8?
Repetition

- Sometimes don’t know exactly how many times a set of instructions are repeated.
- Stopping is based on a condition
- Example:
  - Game of Chess, how many moves until win
  - Stop: when markers are in check mate position

- Indefinite Repetition
  - Where number of repetitions not known in advance
  - Use **while** statement
While statement

- While some condition is true
  - execute instructions

condition true?

no

yes

exit loop

execute instructions
General “Rule of Thumb”

• As a general rule, a While loop should be written so the loop will eventually end
  – Requires statements inside the loop change the conditions of the world such that condition for While eventually becomes false

• If While loop never ends
  – Infinite while loop
Q1 Compare – What is difference?
Q1 Compare – What is difference?

- While loop stops when bunny is close to panda
- Count loop bunny just walks three times
Q2. What happens when run?

- First loop, falcon moves down until partially in the ground.
- Second loop, nothing happens since the condition is never true. The pig is not above ground.
Q2. What happens when run?

- First loop, falcon moves down until partially in the ground
- Second loop, nothing happens since the condition is never true. The pig is not above ground.
Q3 What happens, when does the loop stop?

- They move towards each other repeatedly until their distance is less than 1.0.
Q3 What happens, when does the loop stop?

- They move towards each other repeatedly until their distance is less than or equal to 1.0
Q4 What happens, when does the loop stop? (numbers different)
Q4 What happens, when does the loop stop? (numbers different)

- They move way too much compared to how close they are suppose to be. This could be an infinite loop!
Q5 What happens when this runs?

This is an infinite loop! The bunny is never red when the condition is tested. So the condition is always true!
Q5 What happens when this runs?

- This is an infinite loop! The bunny is never red when the condition is tested. So the condition is always true!
Q6 What code could I use to stop this loop?

```java
// How do I stop this loop? What do I put in place of true?
while (true) {
    this.bunny.resize = 1.3;
    add detail;
}
```
Q6 What code could I use to stop this loop?

- Continue while height smaller than some number. Stop when height is bigger.
Class Today

• Catching dinner