Learning Computer Science Concepts in Scratch

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Posttest
Question 1

Here is a diagram of the stage with four sprites (giraffe, elephant, mouse, ball), together with scripts for each of the sprites:

<table>
<thead>
<tr>
<th>Mouse script</th>
<th>Elephant Script</th>
<th>Giraffe Script</th>
<th>Ball Script</th>
</tr>
</thead>
</table>
| when [green] clicked
  go to x: -209 y: 19
  point in direction 90°
| when [green] clicked
  go to x: 200 y: 19
  point in direction 90°
| when [green] clicked
  go to x: 7 y: 123
  point in direction 90°
| when [green] clicked
  go to x: -170 y: 2
  point in direction 90°
| when I receive [start]
  say Kick for 1 sec
| when I receive [start]
  say Ready for 1 sec
| when I receive [start]
  broadcast [start]
| when I receive [start]
  say [start] for 1 sec
| wait until touching ball
| wait until touching ball
| wait until touching ball
| wait until touching ball |
| next costume
| wait 1 sec
| wait 1 sec
| glide 1 sec to x: 167 y: 19
| point in direction -90°
| point in direction 90°
| wait 1 sec |
| when I receive [start]
  wait until touching mouse
| when I receive [start]
  wait until touching elephant
| when I receive [start]
  wait until touching giraffe
| when I receive [start]
  wait until touching ball |
| glide 1 sec to x: -175 y: 0
| wait 1 sec
| wait 1 sec
| glide 1 sec to x: -157 y: 19
1. (Multi Applying) What operations take place concurrently until the instruction
   ![broadcast](start)
   in the script for the giraffe is run?

2. (Multi Understanding) What is the difference between the instructions ![say]( ) and
   ![broadcast]( )?

3. (Relational Applying) Describe the behavior of the animals and the ball when (all) the
   scripts are run after clicking on the green flag.

4. (Multi Creating) We wish the animation to be repeated indefinitely without clicking
   again on the green flag. What instruction or instructions must be added? (Add
   instructions only to scripts that actually need additional instructions for this to happen.)

5. (Multi Creating) Add a variable “counter” to the animation. It will count the number of
   times that the ball is passed from one animal to another.
Question 2

1. (Relational Creating) Create an animation for two sprites that will initially be placed at two corners of the stage. One sprite will send a message to the other. When the second sprite receives the message, the two sprites will exchange places by gliding.

2. (Relational Creating) Modify the animation so that when the two sprites touch each other, they will exchange greetings.

3. (Multi Creating) Add instructions so that the sprites exchange places five times.
Question 3

(Multi Understanding) Explain the following concepts. Your explanations may contain examples that are Scratch instructions.

- Initialization
- bounded repeated run
- conditional repeated run
- conditional run
- sending and receiving a message
- variable
- concurrent run