

Debugging Demystified

ScratchEd Webinar Series

Wednesday, November 30, 2011

7pm – 8pm EST

Karen Brennan and Mitch Resnick

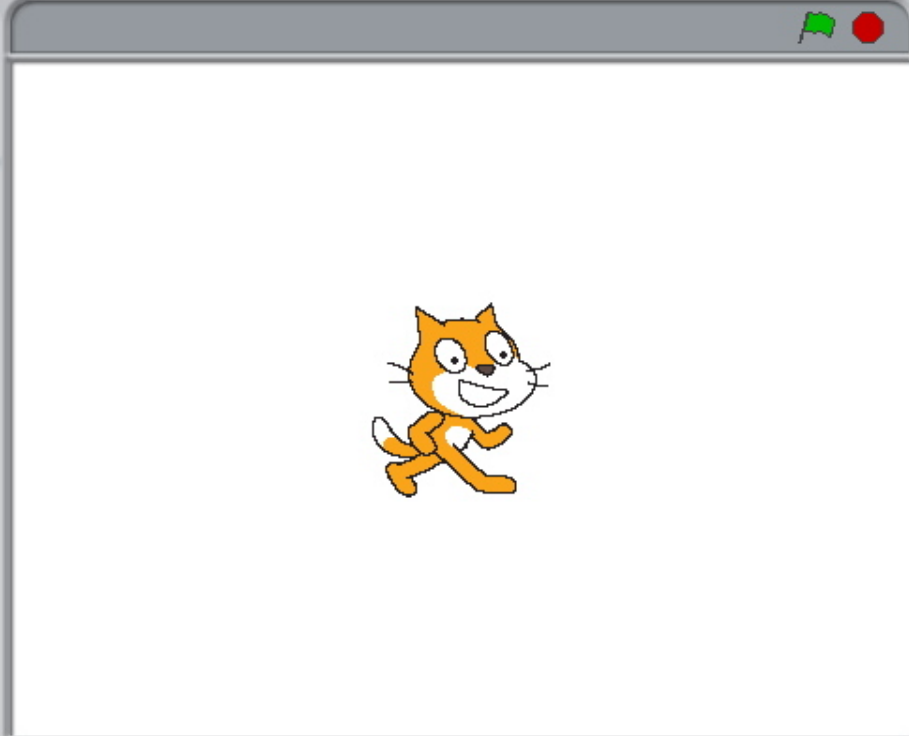
- Motion
- Control
- Looks
- Sensing
- Sound
- Operators
- Pen
- Variables


Sprite1
x: 0 y: 0 direction: 90

Scripts
Costumes
Sounds

- move 10 steps
- turn 15 degrees
- turn 15 degrees
- point in direction 90
- point towards
- go to x: 0 y: 0
- go to
- glide 1 secs to x: 0 y: 0
- change x by 10
- set x to 0
- change y by 10
- set y to 0
- if on edge, bounce
- x position
- y position
- direction

Scripting area with a grey background and vertical lines.



New sprite: x: 251 y: -214



There will be problems.

9/9

0800 Antan started
 1000 " stopped - antan ✓
 13⁰⁰ MC (032) MP - MC ~~1.982147000~~
 (033) PRO 2 2.130476415 (-2)
 connect 2.130676415

{ 1.2700 9.037 847 025
 9.037 846 995 connect

Relays 6-2 in 033 failed special speed test
 in relay " 10.000 test.

Relay
 2145
 Relay 3376

1100 Started Cosine Tape (Sine check)
 1525 Started Mult + Adder Test.

1545



Relay #70 Panel F
 (moth) in relay.

First actual case of bug being found.

~~1630~~ Antan started.
 1700 closed down.

Bugs can cause anxiety.

**Bugs can cause anxiety.
But they don't need to.**

**As they puzzled together the child had a revelation:
“Do you mean,” he said,
“that you really don’t know how to fix it?”**

The child did not yet know how to say it, but what had been revealed to him was that he and the teacher had been engaged together in a research project. The incident is poignant. It speaks of all the times this child entered into teachers’ games of “let’s do that together” all the while knowing that the collaboration was a fiction.

Discovery cannot be a setup; invention cannot be scheduled.

Strategy #1

Don't make the problem.

Be incremental.

Test as you go.

Strategy #2

Fix the problem.

Debugging is fun!

Be patient.

Strategy #2 **Fix the problem.**

Debugging is fun!
Be patient.

Break it down.
 Check your assumptions.
 Sketch out the steps.
 Test in a modular way.

Strategy #2

Fix the problem.

Debugging is fun!

Be patient.

Break it down.

Experiment with the code.

Read through scripts.

Experiment with scripts.

Try writing scripts again.

Strategy #2

Fix the problem.

Debugging is fun!

Be patient.

Break it down.

Experiment with the code.

Get help.

Tell someone else about the problem.

Ask someone else about the problem.

Look for examples that work.

Strategy #2

Fix the problem.

Debugging is fun!

Be patient.

Break it down.

Experiment with the code.

Get help.

Take breaks.

Strategy #2

Fix the problem. (Scratch strategies!)

Click on a stack.

Visualize with the say block.

Single step.

Annotate code with comments.

Print out scripts to see them side by side.

Post to *All About Scratch*.

- Motion
- Control
- Looks
- Sensing
- Sound
- Operators
- Pen
- Variables

ball x: 24 y: 118 direction: 163

Scripts Costumes Sounds

- move 10 steps
- turn 15 degrees
- turn 15 degrees
- point in direction 90
- point towards
- go to x: -17 y: 61
- go to
- glide 1 secs to x: -17 y: 61
- change x by 10
- set x to 0
- change y by 10
- set y to 0
- if on edge, bounce
- x position
- y position
- direction

```

when green flag clicked
  go to x: 13 y: 157
  wait until touching color red?
  stop all

when green flag clicked
  forever if touching paddle?
    play sound water_drop
    point in direction 180 - direction
    move 5 steps
    turn pick random -20 to 20 degrees

when green flag clicked
  forever
    if on edge, bounce
    move 4 steps
  
```

4 Pong



x: 228 y: -126

New sprite:



ball

paddle



Stage

- Motion
- Looks
- Sound
- Pen
- Control
- Sensing
- Operators
- Variables

hey yay yay

x: 29 y: 148 direction: 90

Scripts Costumes Sounds

```

switch to costume singer1
next costume
costume #
say Hello! for 2 secs
say Hello!
think Hmm... for 2 secs
think Hmm...
change color effect by 25
set color effect to 0
clear graphic effects
change size by 10
set size to 100 %
size
show
hide
go to front
go back 1 layers
  
```

```

when hey yay yay clicked
broadcast hey ya ya hey
play sound heyayay1
switch to costume singer1
repeat 6
  change brightness effect by 10
  wait 0.2 secs
repeat 6
  change brightness effect by -10
  wait 0.2 secs
set brightness effect to 0
  
```

6 BreakDance



Click the boombox and the other icons

x: 248 y: 105

New sprite:

- instruct...
- B boy
- boombo...
- hey yay...
- turntabl...
- turntabl...
- check t...



- Motion
- Control
- Looks
- Sensing
- Sound
- Operators
- Pen
- Variables

Sprite1

x: -71 y: -24 direction: 90

Scripts Costumes Sounds

move 10 steps

turn 15 degrees

turn 15 degrees

point in direction 90

point towards

go to x: -71 y: -24

go to

glide 1 secs to x: -71 y: -24

change x by 10

set x to 0

change y by 10

set y to 0

if on edge, bounce

x position

y position

direction

```

when green flag clicked
  show
  switch to costume costume1
  go to x: -76 y: -22
  say Alright, class! I will give you 2 minutes to correct 7
  glide 1 secs to x: -79 y: -329
  hide
  wait 3 secs
  broadcast work
  go to x: -76 y: -22

when I receive done
  show
  say Times up! Let's see your work. for 4 secs
  broadcast 1
  hide

when I receive back
  show
  say What about you, Alex? for 2 secs
  hide
  broadcast lolz
  switch to costume costume2
  go to x: -71 y: -24

when I receive lol
  show
  
```

PUNCTUATION SAVES LIVES



x: 113 y: 149

New sprite:

Sprite1 Sprite2 Sprite3 Sprite4 Sprite5 Sprite6

Stage

- Motion
- Control
- Looks
- Sensing
- Sound
- Operators
- Pen
- Variables

Alien1
 x: -75 y: -24 direction: 90

Scripts Costumes Sounds

```

switch to costume costume1
when I receive Shampoo
  if Me = 1
    set size to 200 %
    go to x: 0 y: -70
    stamp
    set ghost effect to 100
  
```

This stamps a picture of the alien for when it is thime to shampoo, so that the bubbles can go OVER your alien.

```

when I receive Begin Game
  set ghost effect to 0
  show
when Allen1 clicked
  if AllenChosen = 0
    set AllenChosen to 1
    set Me to 1
    go to x: 0 y: -45
    set size to 150 %
    broadcast Color
  
```

When your alien has been clicked, if the user has not yet chosen his/her alien's shape, the sprite knows that the user has chosen it as a shape template.

```

when I receive Color
  forever
    if Me = 1
      show
    else
      hide
  
```

For step 2, if this sprite was chosen as the shape, show. Otherwise, hide.

- move 10 steps
- turn 15 degrees
- turn 15 degrees
- point in direction 90
- point towards
- go to x: -75 y: -24
- go to
- glide 1 secs to x: -75 y: -24
- change x by 10
- set x to 0
- change y by 10
- set y to 0
- if on edge, bounce
- x position
- y position
- direction

Alien Of My Own ...

Time: 0:00

Notifications: Let's make your alien.

Inventory: length: 3

Money: 2500

New notification

x: 260 y: -474

Stage

Items: Alien1, Go Home, WaterSt..., Dog, DogFoo..., BallStat, WaterSt..., SteakSt..., GAMER 2000, GAMER 2000, DSSStat, Console..., Alien2, Alien3, Plant, close, FALSE

- Motion
- Looks
- Sound
- Pen
- Control
- Sensing
- Operators
- Variables

record button  x: -170 y: -120 direction: 90

Scripts | Costumes | Sounds

- move 10 steps
- turn 15 degrees
- turn 15 degrees
- point in direction 90
- point towards
- go to x: -170 y: -120
- go to
- glide 1 secs to x: -170 y: -120
- change x by 10
- set x to 0
- change y by 10
- set y to 0
- if on edge, bounce
- x position
- y position
- direction

```

when green flag clicked
  go to x: -170 y: -120
  switch to costume not

when record button clicked
  broadcast stop
  wait 0.2 secs
  set recording? to 1
  switch to costume recording
  delete all of x positions
  delete all of y positions
  repeat until recording? = 0
    add mouse x to x positions
    add mouse y to y positions

when I receive stop
  set recording? to 0
  switch to costume not
  
```




first, we clear all previous values.

This "repeat" keeps adding current mouse positions to the list until the play button is clicked.

5 MouseRecorder



Click the record button and move the mouse around. Then press play to see your movements played back!

New sprite:   

record ... play but... stop bu... mouse

Stage



imagine • program • share

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<http://scratch.mit.edu/forums>

Strategy #3 **Change your goal.**



Debugging challenges

Stories

Resources

Discussions

Members

Resources Home Search Resources Explore Keywords

Debug it!

Submitted by [Karen Brennan](#) on July 28, 2010

1 Comment 2 Bookmarks

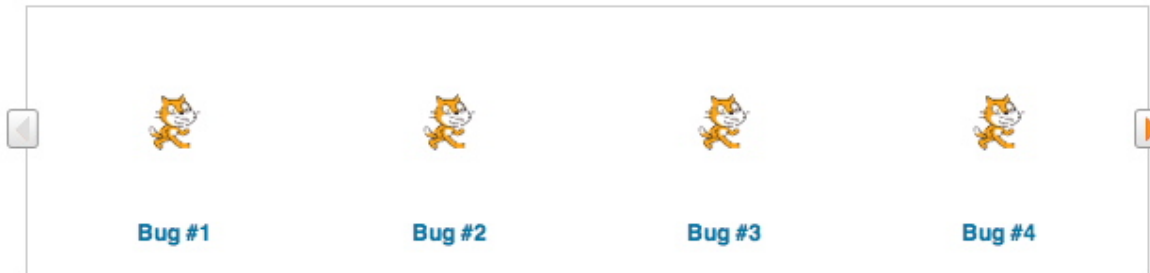
This is a collection of 5 short Scratch programs that aren't working the way the creator intended.

I used this as an activity at the CS4HS Creative Computing workshop, as a way of talking about the importance of debugging as a computational practice. I broke the participants up into 5 groups and each group focused on a bug. Each team then shared their bug with the rest of the group, demonstrating a way (or multiple ways) of fixing the bug.

Original Author: Karen Brennan
Ages: Any
Curricular Areas: Any
Content Types: Activities and Projects
Keywords: [debugging](#)

Resource Files

Scratch Projects:



Other Files:
 [DEBUG_IT.pdf](#)
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Comments

Contribute Resources

What helps you to support people learning with Scratch? With resources, you can share all types of content, across different curricular areas and ages.

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[Erica Roberts](#)



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Related Resources

[Extreme Environments: Building a Simple Lunar Lander](#)

["Highest Score" for games Escape the Room Tutorial](#)

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<http://scratched.media.mit.edu/resources/debug-it>

One of my fish isn't swimming right!

**I am new to Scratch and stuck building a space invaders game.
The ship works and can fire at a sprite.
But when it hits the sprite nothing happens.
I have tried more than one solution without any luck so far.
Any advise would be great.**

I made this for my programming class. Problem is though, is when the turkey sprites are suppose to follow the mouse pointer until they reach the destination (table) or hit one of the sides (black lines) the script should restart. Instead of even following the mouse pointer, right when the numbers count down and the game should start, instantly the game screen disappears and it goes back to the interface. Like I said before, it should ONLY do this when a black line or the table is touched. Can you tell me what I did wrong?

Thank You!

<http://www.surveymonkey.com/s/2011-11-webinar>

Next webinar: Wednesday, January 25, 2012 at 7pm

<http://scratched.media.mit.edu>

<http://scratched.eventbrite.com>