Threads & Events – Test Yourself

What will the sprite do? First, write your answer

Then, discuss with others

Run: demo04-hopping-cat.sb
Thread Synchronization

- Modify the hopping cat code to ensure that the cat jumps 3 times then moves across the stage.
  - Continue using 'broadcast' and 'receive' statements

- Then: Can you achieve the same effect without using 'broadcast' and 'receive' statements?
  - Hint: Use of variables for synchronization
Thread Synchronization

Broadcast-Receive

Thread 1

Receive event

Broadcast event

Thread 2

Boolean-Variable

Thread 1

Flag
Initialized to 0

Set Flag = 1

Thread 2

Wait until <Flag = 1>
Writing a Scratch game: Activity – Pair programming

• Watch the drag-and-drop game demo

• You and your neighbour have to create this game
  • One of you has to write the script for the 'trashcan' while the other writes the script for the 'trash' sprite

• High-level design
  • **Think:** Write down the main steps in your sprite
  • **Pair:** Decide how will your sprites synchronize
  • **Share:** Discuss few approaches, Interoperability issue
Main ideas of one solution approach

Trash sprite
- Appear at the top
- Fall towards bottom
- Recognize mouse click on itself
- Recognize and follow mouse drag into can
- Disappear into can
- Update score

Trashcan sprite
- Appear at bottom
- Play song; keep timer
- Recognize trash entry into can
- Keep track of score
- Special effects: Open and close the can
Synchronizing threads in the solution

Trash sprite
- **Thread1: Falling**
  - Start falling
  - Recognize mouse click
  - Signal (Broadcast) Thread2
  - Recognize touching can
  - Signal Trashcan
- **Thread2: Dragging**
  - When I receive signal from Thread1
  - Recognize and follow mouse drag into can

Trashcan sprite
- **Thread1: Timer**
  - Appear at bottom
  - Play song; keep timer
  - End program (Stop all)
- **Thread2: Scorer**
  - When I receive signal from Trash.Thread1
  - Update score
- **Thread3: Open-close**
Writing a game in Scratch

- Slides 22-28 from cs50.pdf

- See other examples in:

- More student-created projects:
  - http://scratch.mit.edu/galleries/view/57866
Muddy Points

What: Forum created on Moodle

- Post queries about points that are 'muddy', i.e., not clear to you
- Write your query on a chit of paper and hand it to me

Why:

- Not enough time to discuss queries immediately after class
- Many queries are worth discussing with all

How:

- Queries will be answered by other students or TAs
- Some queries will be discussed in class
Muddy Points in Scratch?

- Topics: Statements, Blocks, Conditions, Loops, Variables, Arrays, Threads, Synchronization

- Take two minutes to fill out the Muddy Points chits
  - You need not wait to post on Moodle
  - You can ask questions anonymously, if you wish

- Today: You should submit one or two muddy points from topics done in the class/lab so far
  - Be specific in your query. For example, If you are not clear about some aspect of Arrays, don't simply write 'Array'. Give details of what is not clear to you.
Announcements

• Friday lab batch:
  • Will have lab-02 today.
  • Will have lab-3 tomorrow (instead of next friday).

• Quiz 1: Next Friday - 31\textsuperscript{st} Jan 2014.
  • Starts at 08:15 AM, be in your places by 08:10 AM.
  • No compensation or re-quiz. If you miss it, too bad.
  • One A4 sheet of handwritten notes is allowed.
  • Portion: All topics done so far, including next class.
  • Questions: Will be similar to what you have been working on in class and lab.