Computation helps... remember information

How to Track Information?

What is your name?
Every person has a Name
- "Name" is label or placeholder
- Name is a variable (different than variable in math)
People have different values for Name
- Any value can be placed there
- Value varies across individuals

What if Information Change?

How old are you?
Every person has an Age
- "Age" is a variable
- People have different values for age
How is "age" different than "name"?
- Value of age varies over time!
- Increases by one each year

What are Interesting Variables?

Examples?
- Money in your bank account
- Your GPA
- Number of facebook friends
- Top grossing film of all time
- Current President of United States
- Winner of World Cup
- Number of current points in basketball game
Can be referred to without knowing current value
What type of values do variables hold?
- Often strings (words) or numbers (integers and floating point)
Why the Interest in Variables?

Sometimes just want to know value

Often value of variable changes behavior
  • Current value of variable determines what we do

Variables in Scratch

Scratch contains some variables by default...
  • Example: answer

Variables Change Program Behavior

What is output if user enters:
  • 95?
    - Excellent
  • 100?
    - Perfect
  • 105?
    - How did you do that?
  • 63?
    - Better luck next time?

How to see output "Great"?
  • 81, 82, ... 89, 90
Variables in Scratch

You can allocate/declare new variables

• Give variable any name you’d like
• Very important to give descriptive names
  – Helps other people understand your code
  – Helps YOU understand your code later
  – Can be displayed to user as well

Using Variables

Variables can hold numbers or strings

Can be used any place a number or string is used

• At some point, you’ll be surprised by this…
Exercise: Moving Around Stage

Version 1:
- Create a variable Time
- Ask user for value of Time
- Forever: Glide to a random (x, y) position in that time

Version 2:
- Before gliding, say the (x, y) position you are going to
  (Hint: Use “join” block under Operators category)

Version 3
- Take one second longer each time you glide!

Answer: Moving Around Stage

Exercise: How to Track Points?

Change Fish Chomp game to track number of fish eaten?
(Open Examples/Games/3 Fish Chomp)

Old Code: No Points

Little Fish Scripts

Big Fish Scripts

Hint: Make as few changes as possible.
Where to initialize Fish Eaten? Where to increment Fish Eaten?
Add Variable: Fish Eaten

New Big Fish Scripts

Is this code same?

Yes! Scratch variables are not mathematical equations. Same variable can appear on both sides of "set" block

Exercise: How to Remember if Something Happened?

Basic format of adventure game

Character can enter portal and advance to next level only after gets certain object

How to know if cat picked up bananas yet or not?

Exercise : Problem Statement

Initial State:
• Level 1 background
• Banana showing (it is not picked up)

When banana is picked up (touching cat)
• It should hide (and remember it has been picked up)
• Hint: Use a variable to remember this!

When touch portal (after picking up banana)
• Advance to level 2 (Switch to level 2 background)

Announcements

Feel free to work in 1370 at any time

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Instructor or TA</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mon</td>
<td>11:00 - 12:00</td>
<td>Prof. A Arpaci-Dusseau</td>
<td>CS 7375 (office)</td>
</tr>
<tr>
<td>Tue</td>
<td>12:30 - 2:25</td>
<td>Thea Hinkle</td>
<td>CS 1370 (lab)</td>
</tr>
<tr>
<td>Wed</td>
<td>11:00 - 12:00</td>
<td>Prof. A Arpaci-Dusseau</td>
<td>CS 7375 (office)</td>
</tr>
<tr>
<td>Wed</td>
<td>12:00 - 2:00</td>
<td>Victor Bittorf</td>
<td>CS 1370 (lab)</td>
</tr>
<tr>
<td>Thurs</td>
<td>4:15 - 6:15</td>
<td>Thea Hinkle</td>
<td>CS 1370 (lab)</td>
</tr>
<tr>
<td>Friday</td>
<td>11:00 - 1:00</td>
<td>Victor Bittorf</td>
<td>CS 1370 (lab)</td>
</tr>
</tbody>
</table>

Homework 3 due Monday
• Should be able to do all 3 parts now
• Ideas for sharing Interactive Stories???