Availability of Slides

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Scratch Programming

Lesson 6: Counted Loops

Three Types of Loops

- Continue Forever without Stopping
- Continue until a condition becomes True
- Loop a given amount of times

Three Types of Loops

Seen These Two

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This is called a “Counted Loop”

Situations For Counted Loops

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- Figure out the grade of each person in a class of 100 students
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- Find out who is the oldest person working in an office building with 325 workers
- Keep track of the score during a baseball game - 9 innings

Baseball Scoring

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- Also, in each inning, the "home" team is up in the "bottom" half of the inning

Baseball Scoring

- Lets write a script to keep track of the score during a baseball game
- 9 inning game
- In each inning, the "visiting" team is "up" first during the "top" half of the inning
- Also, in each inning, the "home" team is up in the "bottom" half of the inning
- A whole inning consist of both teams being up in this order.

Baseball Scoring

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- The team that has the most runs at any point in the game is "winning"
- If neither team has more, it is a "tie" game

Baseball Scoring

- After the last inning - the 9th - ends, the game is over and the team with the most runs wins the game

Baseball Scoring

- Our script will keep track of the score

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- After each half inning, it will announce which team is leading (has the most runs so far)

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- After each half inning, it will announce which team is leading (has the most runs so far)
- Or, if neither then it will say it is a tie

Baseball Scoring

- Because this is one of the most well-known rivalries in all of sports, in our script we will make the visiting team be the “Boston Red Sox” and the home team be the “NY Yankees.”

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  (Apologies to fans of other teams, the code can be modified to work with any two teams)

Baseball Scoring - Variables

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Handling an Inning

- As usual, it is wise to tackle a complicated problem by working on simpler parts first

Handling an Inning

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- So lets forget about 9 innings, and see if we can handle one inning

Handling an Inning

The Approach

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- Find out how many runs the visiting team got

Handling an Inning

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- Find out how many runs the visiting team got
- Adjust visiting team's score

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Handling an Inning

The Approach
- Ask for # visiting runs
- Adjust VisitingTeamRuns
- State leader or tie
- Ask for # home runs
- Adjust HomeTeamRuns
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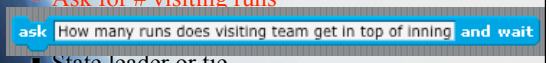
Handling an Inning

The Approach
- Ask for # visiting runs



- State leader or tie
- Ask for # home runs
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Handling an Inning

The Approach
- Ask for # visiting runs
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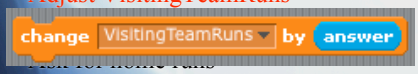

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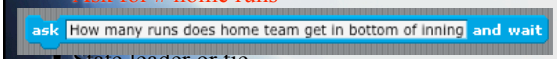

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Handling an Inning

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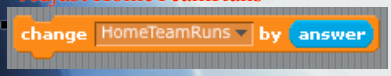
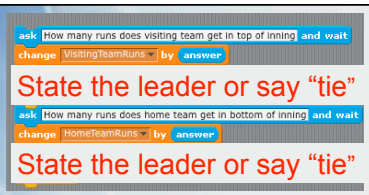
- 



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Announce Leader

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Announce Leader

- Have to decide who is leading
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- Three choices

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- What do you use to make a three-way decision?

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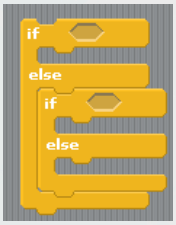
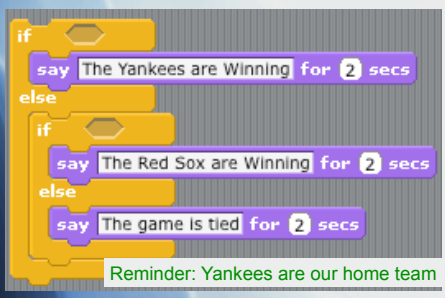
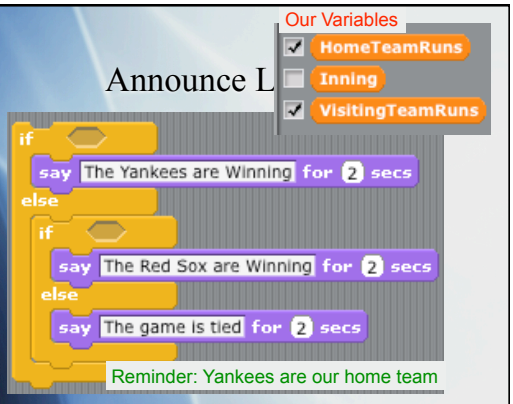


Announce Leader



Reminder: Yankees are our home team

Announce L



Reminder: Yankees are our home team

Announce L

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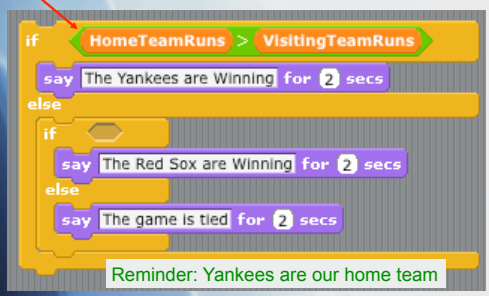
What condition goes here?

Announce Leader



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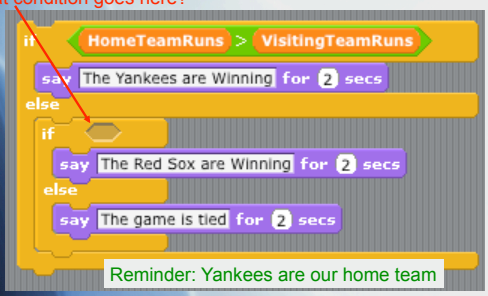
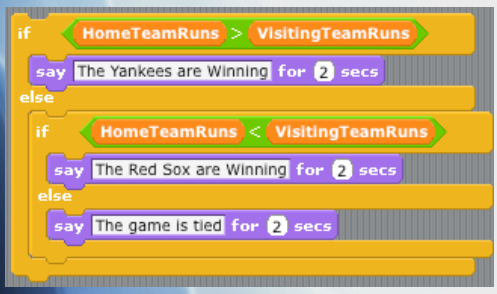


Reminder: Yankees are our home team

Announce Leader



Handling an Inning

The Approach

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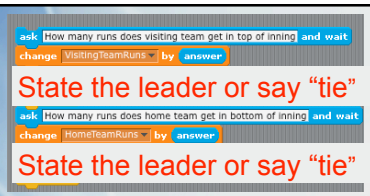

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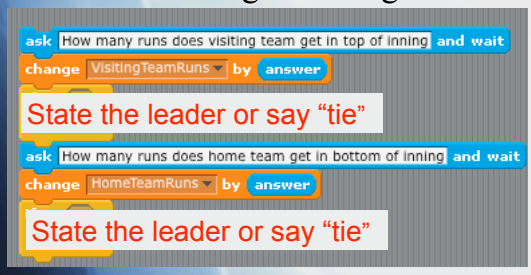
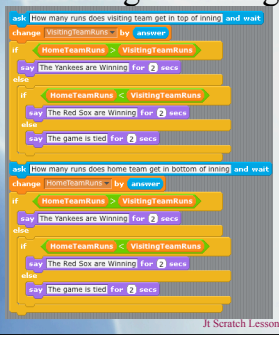
Handling an Inning



Handling an Inning



Handling an Inning

Handling an Inning

Demo: Baseball Scoring 1

Handle Visitors

Say who is winning or "tie"

Handle Home Team

Say who is winning or "tie"

Handling The Whole Game

Handling The Whole Game

- Start when green flag clicked

Handling The Whole Game

- Start when green flag clicked
- Announce game

Handling The Whole Game

- Start when green flag clicked
- Announce game
- Set score to 0 - 0

Handling The Whole Game

- Start when green flag clicked
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- 9 Times:

Handling The Whole Game

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Handling The Whole Game

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  Handle an Inning
- End

Handling The Whole Game

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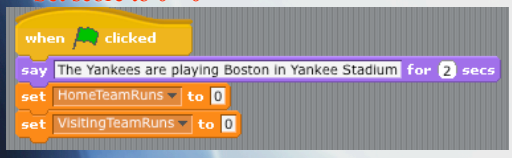
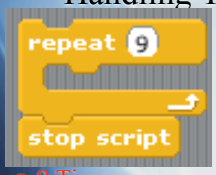


Handling The Whole Game



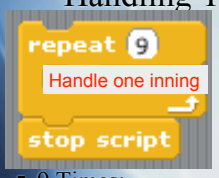
- 9 Times:
  Handle an Inning
- End

Handling The Whole Game

Finally, we use the counted loop !

- 9 Times:
  Handle an Inning
- End

Handling The Whole Game



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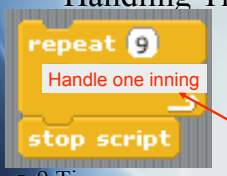
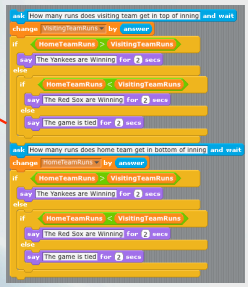
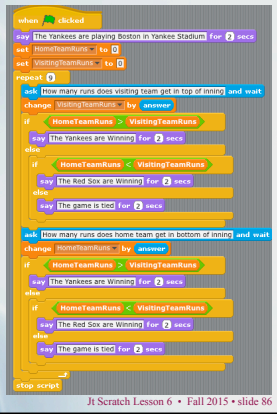
Handling The Whole Game



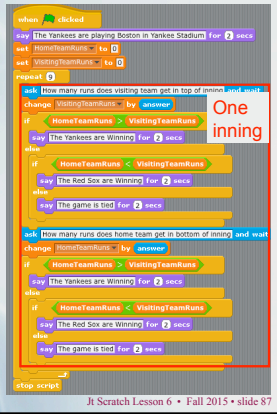


- 9 Times:
  - Handle an Inning
- End

Handling The Whole Game



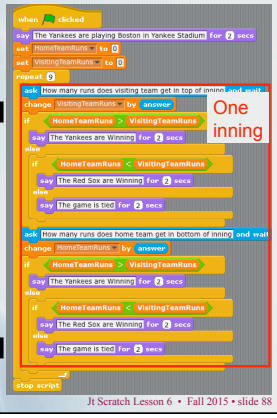
Handling The Whole Game



Handling The Whole Game

The Counted Loop

[Repeat]

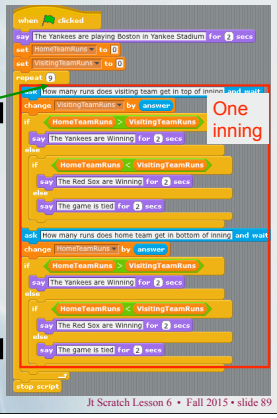


Handling The Whole Game

9 times (9 innings)

The Counted Loop

[Repeat]



Handling The Whole Game

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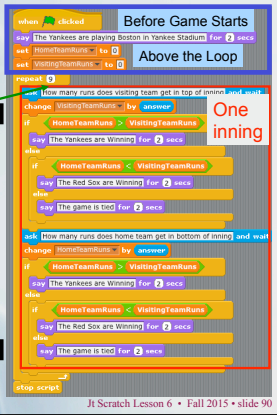
The Counted Loop

[Repeat]



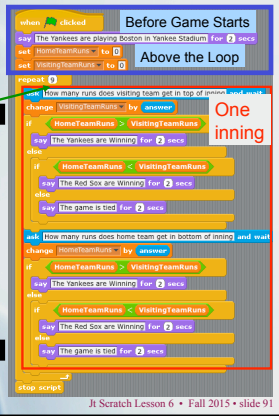
Handling The Whole Game

9 times
(9 innings)

The
Counted
Loop

[Repeat]

Demo:
Baseball
Scoring 2



Multimedia Version

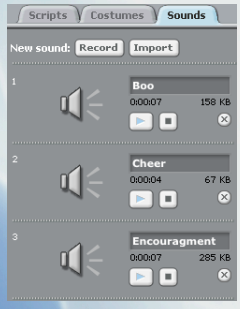
- Demo: Baseball Scoring

Multimedia Version

- Stage:

Multimedia Version

- Script Sounds:



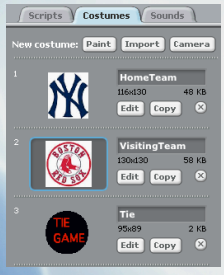
When home team losing

When home team winning

When it's a tie game

Multimedia Version

- Costumes



When home team winning

When home team losing

When it's a tie game

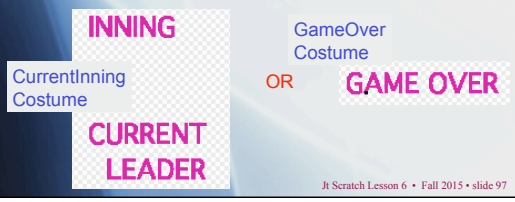
Multimedia Version

- A second sprite

- This is not necessary but it will allow us to change multiple objects on the screen at the same time - so makes a more interesting multimedia presentation

Multimedia Version

- A second sprite
- Two Costumes



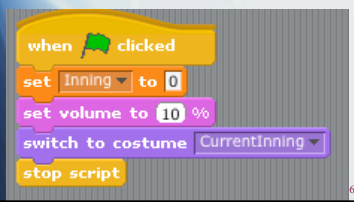
Multimedia Version

- A second sprite
- Some scripts for this sprite

Multimedia Version

- A second sprite
- Some scripts for this sprite

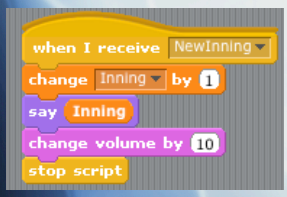
At start, set Inning variable to zero, put sound at low volume & be wearing CurrentInning costume



Multimedia Version

- A second sprite
- Some scripts for this sprite

Each new inning, increment Inning variable, say the Inning & increase volume (so crowd sounds noisier)



Multimedia Version

- A second sprite
- Some scripts for this sprite

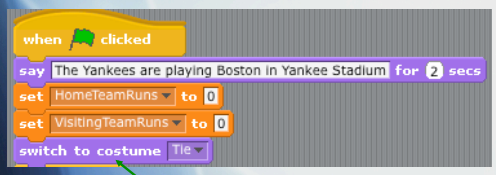
When told that game is over, switch to that final costume

Multimedia Version

- Some changes to script for main sprite

Multimedia Version

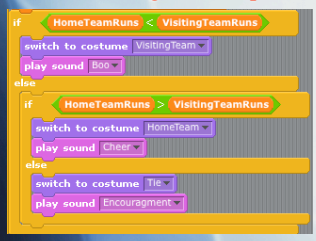
- Some changes to script for main sprite



When game starts, show Tie Game costume

Multimedia Version

- Some changes to script for main sprite



In each nested-IF, instead of saying who is leading or that the game is tied, just switch to appropriate costume and play associated sound effect

Multimedia Version

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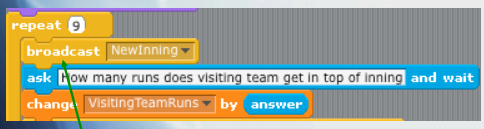
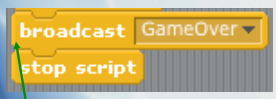


As each inning begins (start of each time around loop), send message to second sprite so it handles new Inning in manner previously discussed

Multimedia Version

- Some changes to script for main sprite



Right before game is over (script stops) send message to second sprite so it changes to GameOver costume (screen message) as previously discussed

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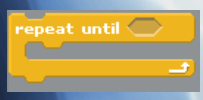
- After nine innings are over, have loop for extra innings, which might happen zero times



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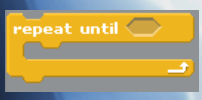

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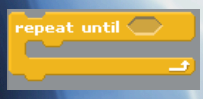

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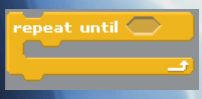

So, what condition means we should no longer have extra innings? (That is no longer should loop?)

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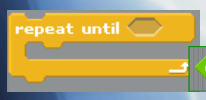

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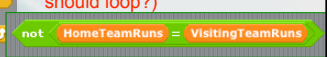

The exact opposite condition

Final Issue

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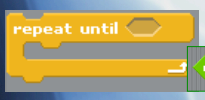
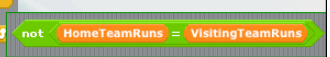


When this is true, we should have no more innings - the loop should stop



Final Issue

- After nine innings are over, have loop for extra innings, which might happen zero times

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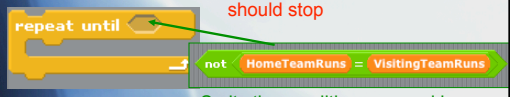

So its the condition we need here

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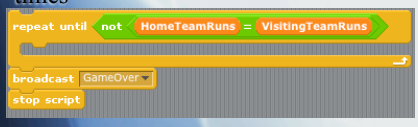

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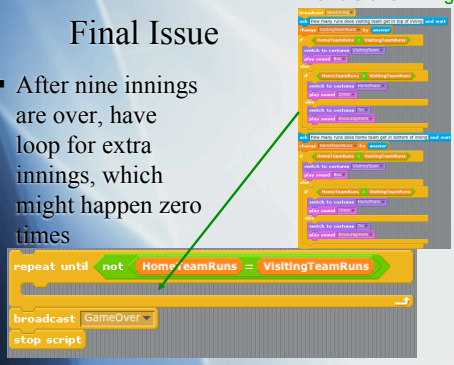
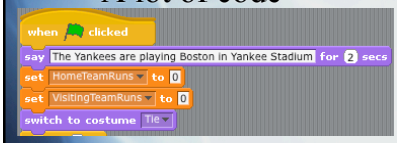
Handle one inning



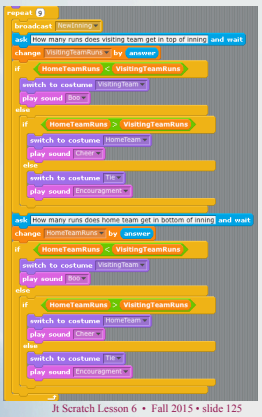
A lot of code



Before game begins

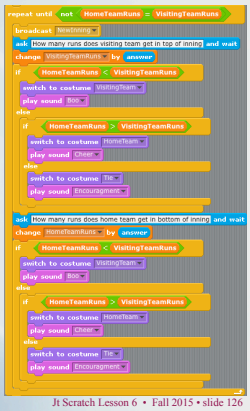
A lot of code

Handle regular nine innings (using repeat loop)



A lot of code

Handle extra innings if necessary (using Repeat Until loop)



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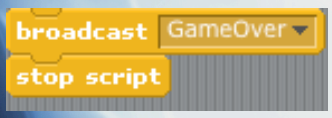

Once past extra inning loop (which often happens zero times but sometime happens a while), the game is no longer tied and is thus over, so handle game ending

A lot of code

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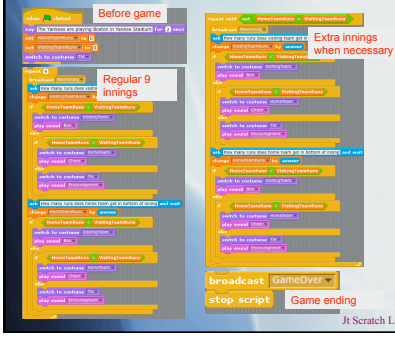
Although buried in different types of loops, these two blocks of code are exactly the same - "handle one inning"

A lot of code



Demo: Baseball Scoring 3

Availability of Slides

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