Scratch

Knoxville Game Design

November 2019

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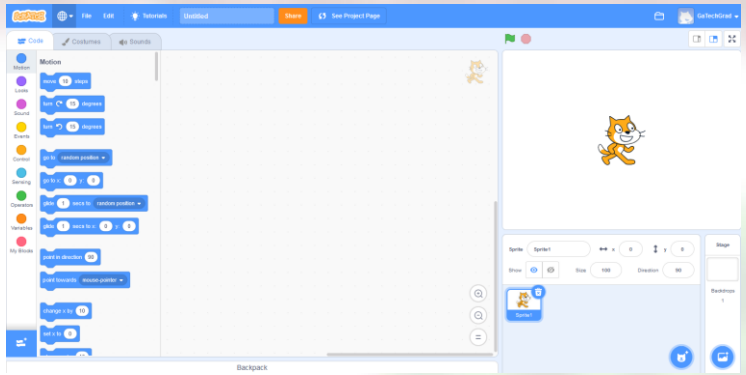
Scratch Overview

- Developed by MIT Labs
- Free to download / use
- Version 1.4 based on Squeak (Smalltalk)
- https://scratch.mit.edu/
- Design Mode (visual blocks) used by Stencyl

Scratch Versions

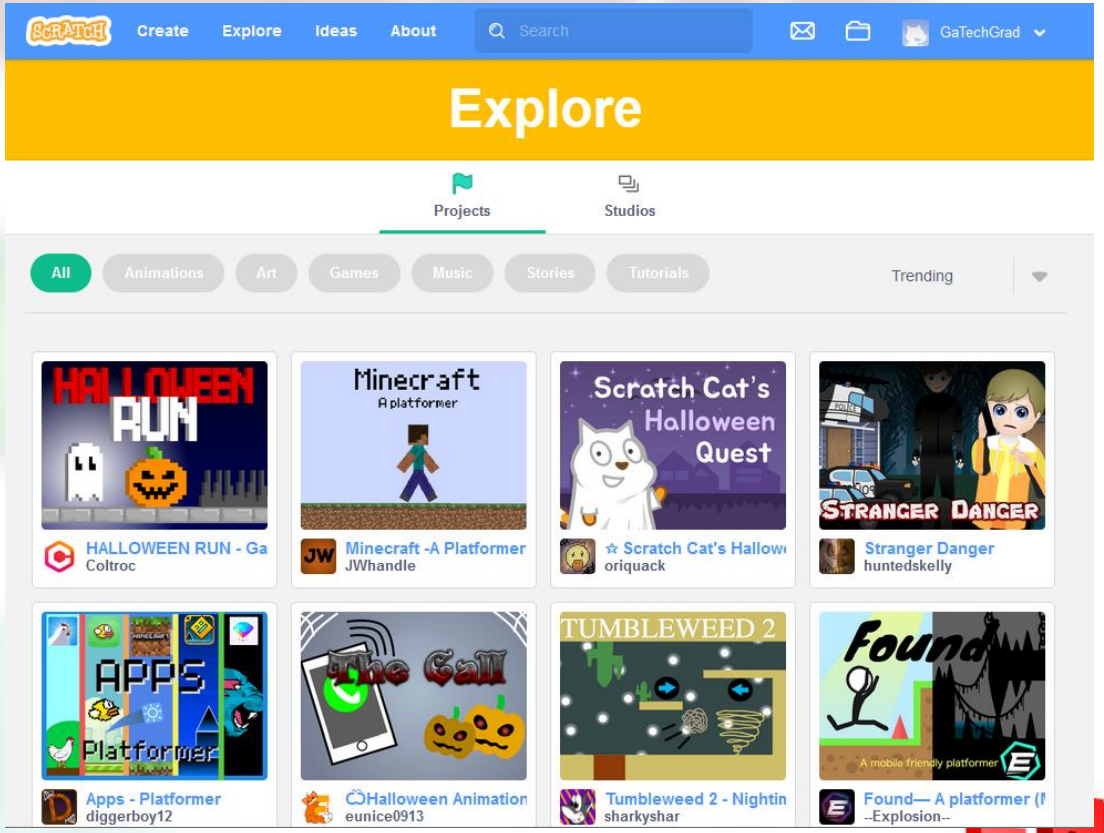
- Web version



- Offline editor - https://scratch.mit.edu/download/
  - Can save projects to file
  - Can be uploaded to Scratch website later

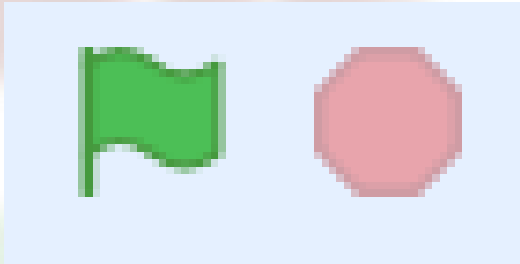
Explore

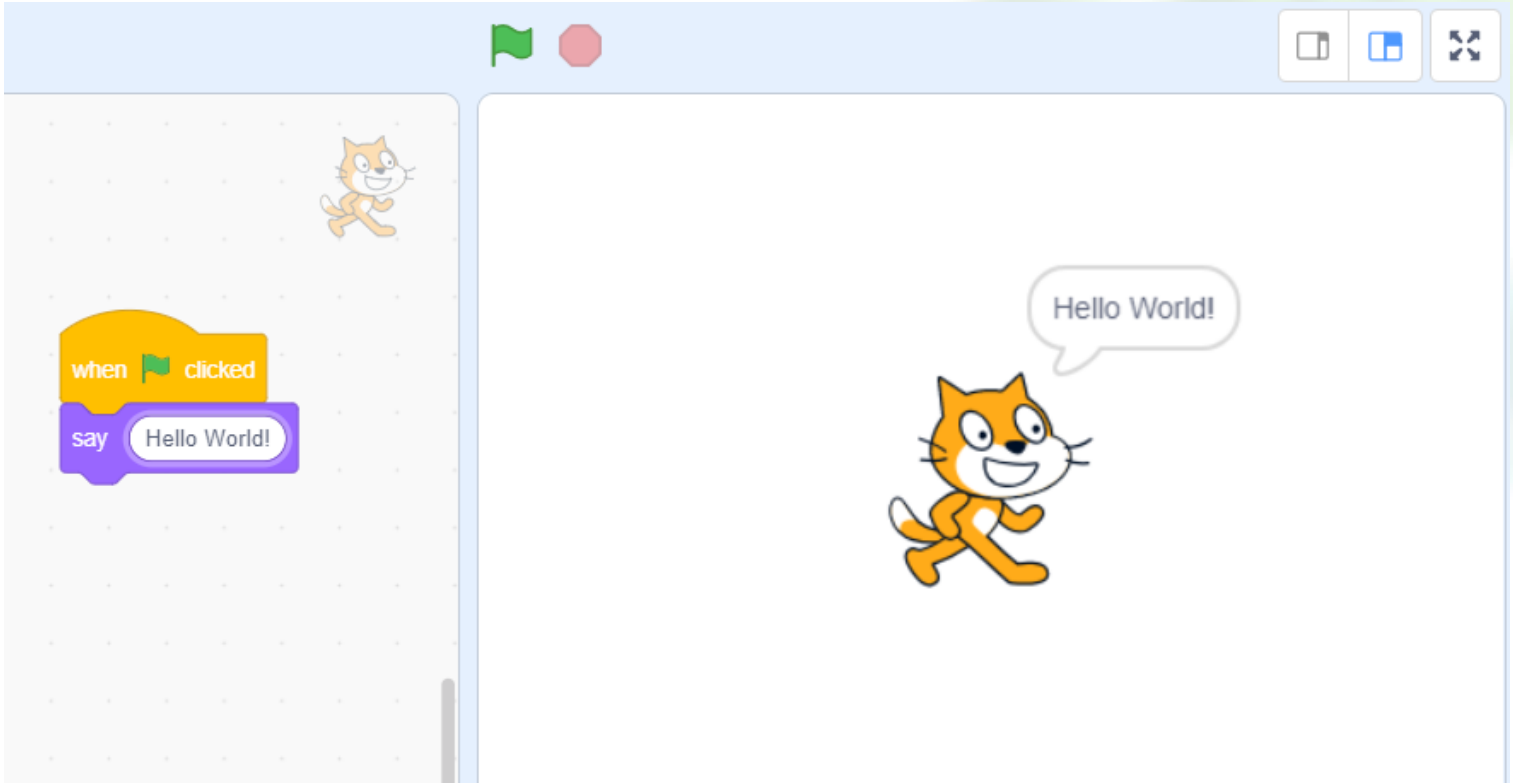
- Repository of user created Scratch games



Running a Scratch Game

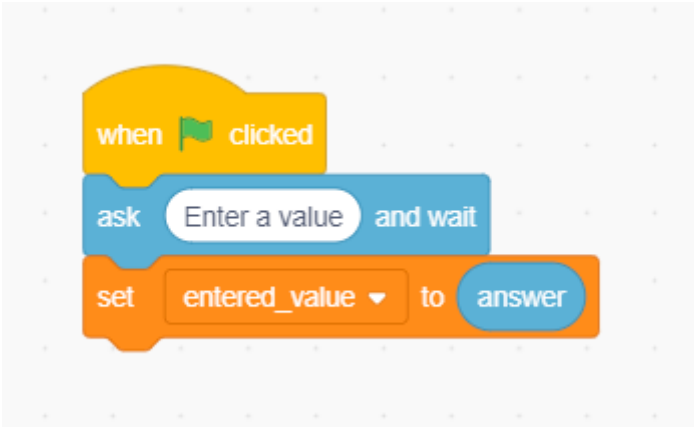
- Green Flag – start program execution
- Red Stop Sign – stop program execution

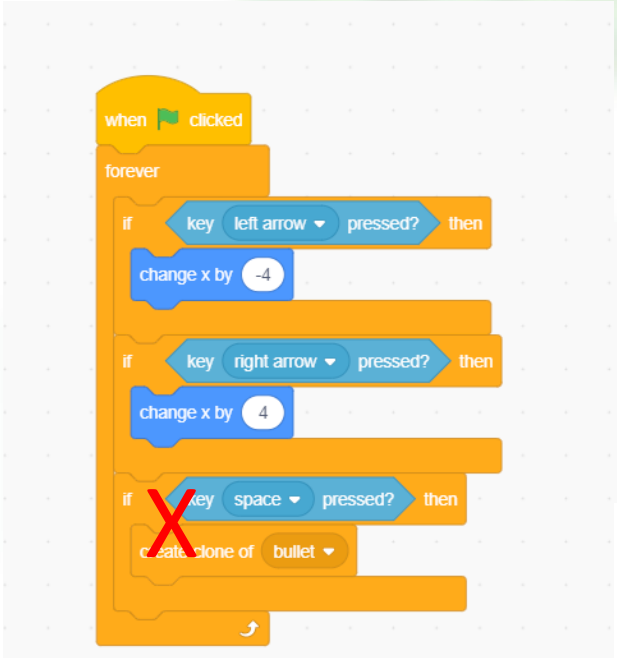


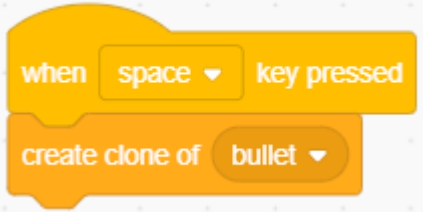


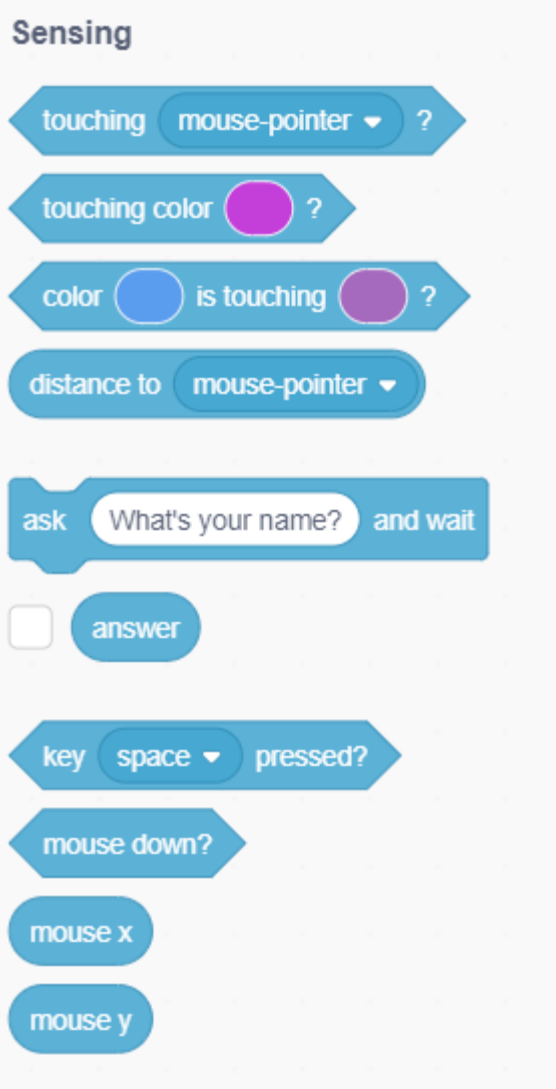
Input

- Use *Sensing* options to read keyboard and mouse input
- Keyboard input obtained with *ask* and stored in *answer*
- Use *set* to assign *answer* to a variable



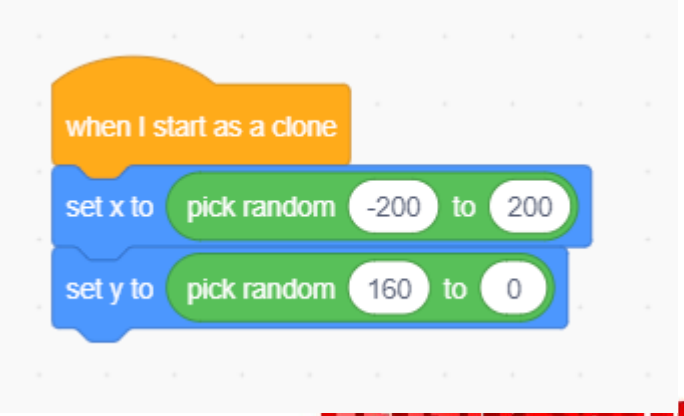




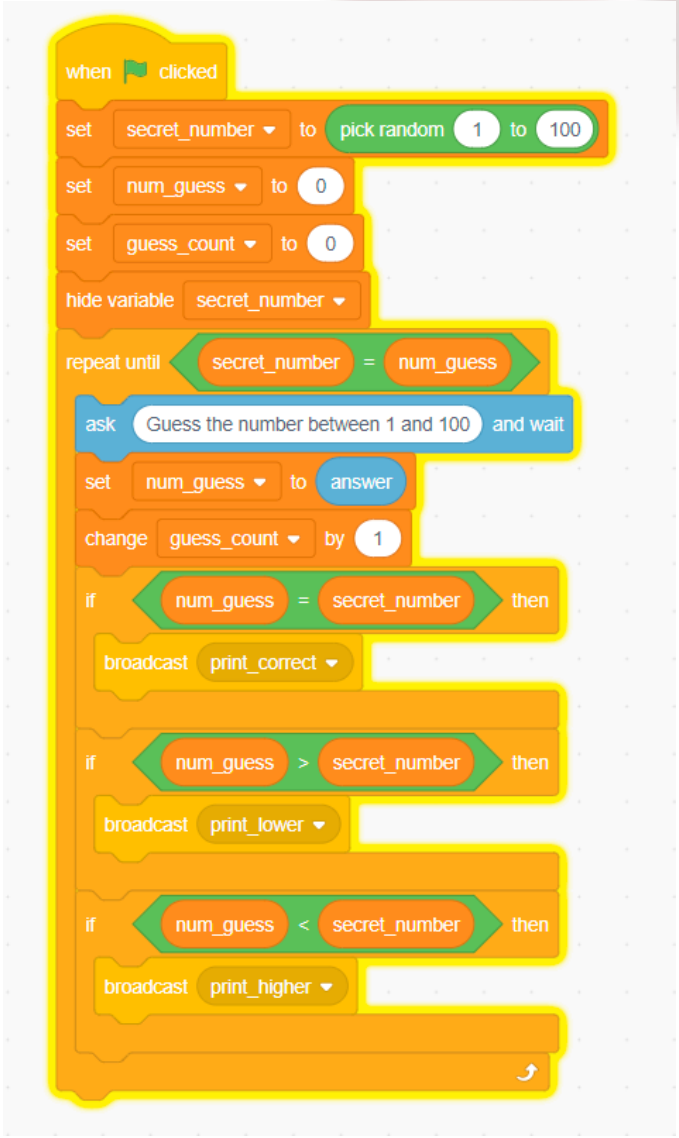


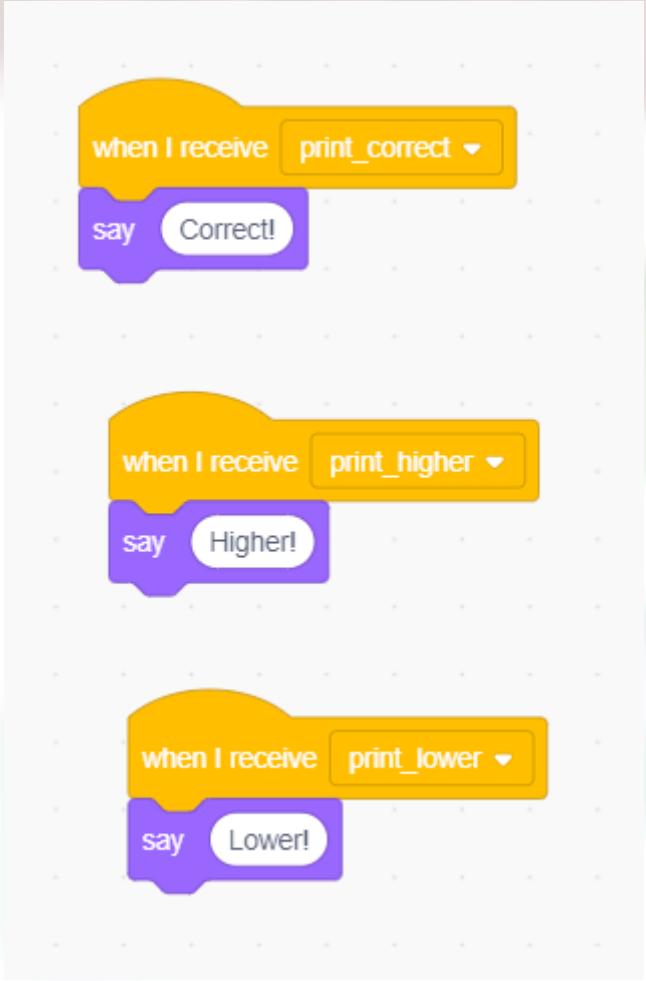
Object Oriented

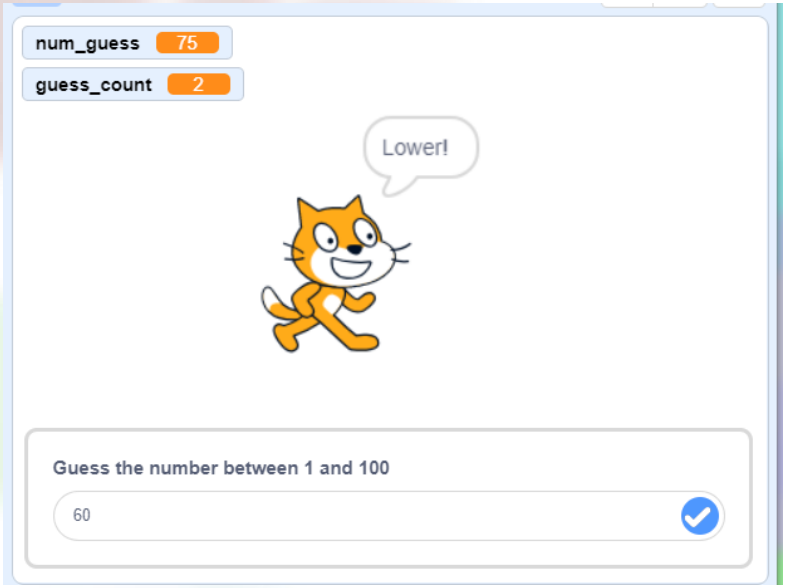
- Code options depend on object or backdrop selected
- Backdrop (“room” / “scene”)
  - Can be used for global / startup code
- Sprite (object)
  - Say / think – for outputting text
  - Move, rotate
- Create instance of object with *create clone*
- Instance start / constructor with *when I start as clone*
- Broadcast – to send messages between backdrops / objects



Number Guessing Game



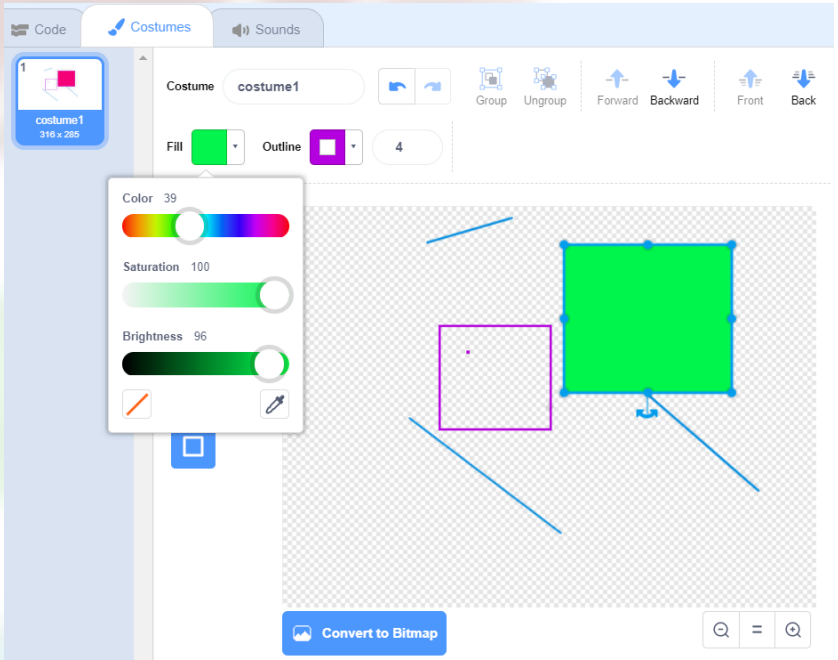




KNOXVILLE GAME DESIGN

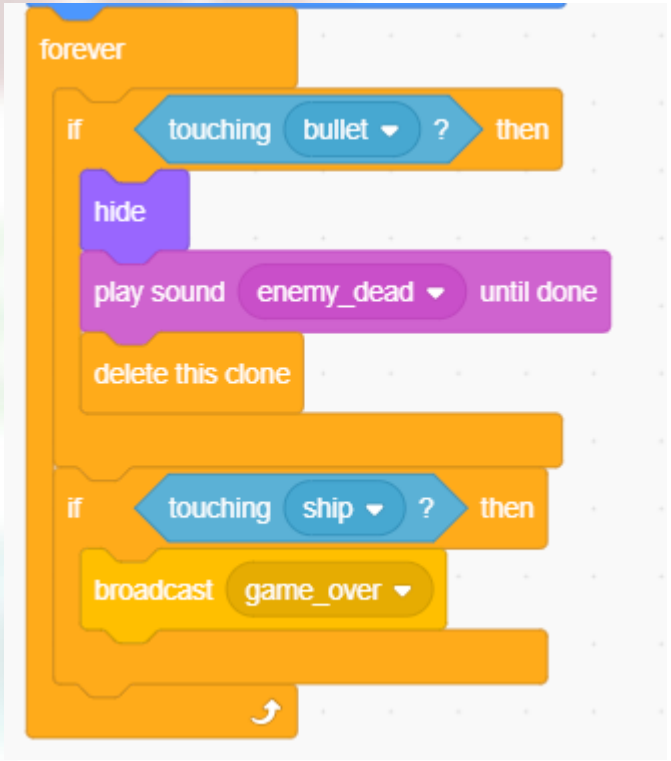
Graphics

- Game resolution – 480x360
  - (-240, -180) to (240, 180)
  - (0, 0) is center
- Sprites “costumes”
  - Built in editor
- Can upload sprites (png, svg, jpeg, gif)
- Use *hide* to make object invisible (dead but playing sound)
- Use *show* to make object visible (hidden Sprite cloned)



Collisions

- Use *touching* block
- Collision boxes are automatically generated
- Needs a reference to “other” object in the collision

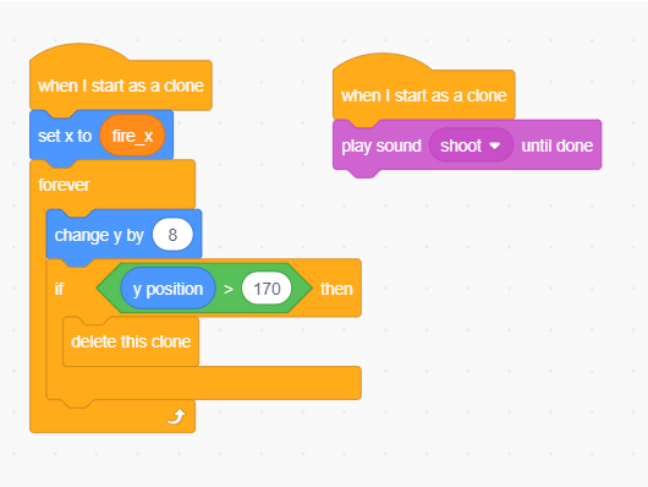


Methods / Procedures

- Reusable code can be placed in *Blocks*

Sounds

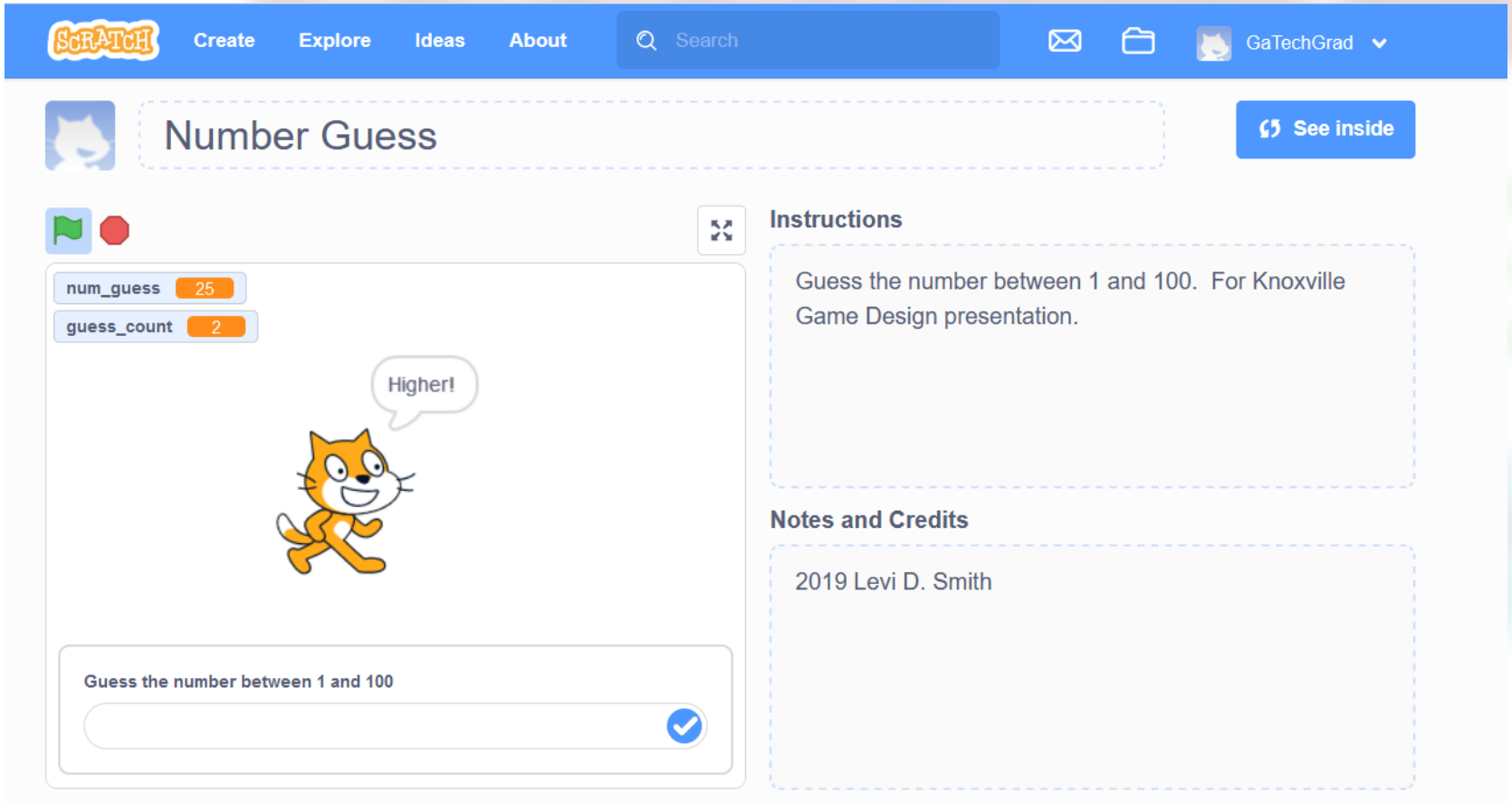
- Can upload (wav, mp3) or record sound effects
- Play with *play sound*
  - (will block any other code until sound is complete)
  - Can have multiple *when I start as a clone* blocks
- Sounds are specific to Sprites
  - If you load a sound to a background, it won't be accessible to a Sprite



Limitations

- Can’t send a parameter with a broadcast message
- Requires Scratch VM to run games; Can’t make a web build for own site
- Have to use global variables to pass values between objects
- No text output aside from *say* and *think* bubbles or standard variable output

Publishing Your Game to Scratch Website



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