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# Scratch Apple Catcher

2024/4/25

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# Objectives

- Learning Scratch Game Design Techniques
  - Sound and Graphic Usage and Effects
  - Variable Usage
  - Utilizing Random Number Generators
  - Creating Clones
  - Function Blocks

# 遊戲情節介紹

## "Apple Catcher in the Desert: Kavi's Spiritual Quest"

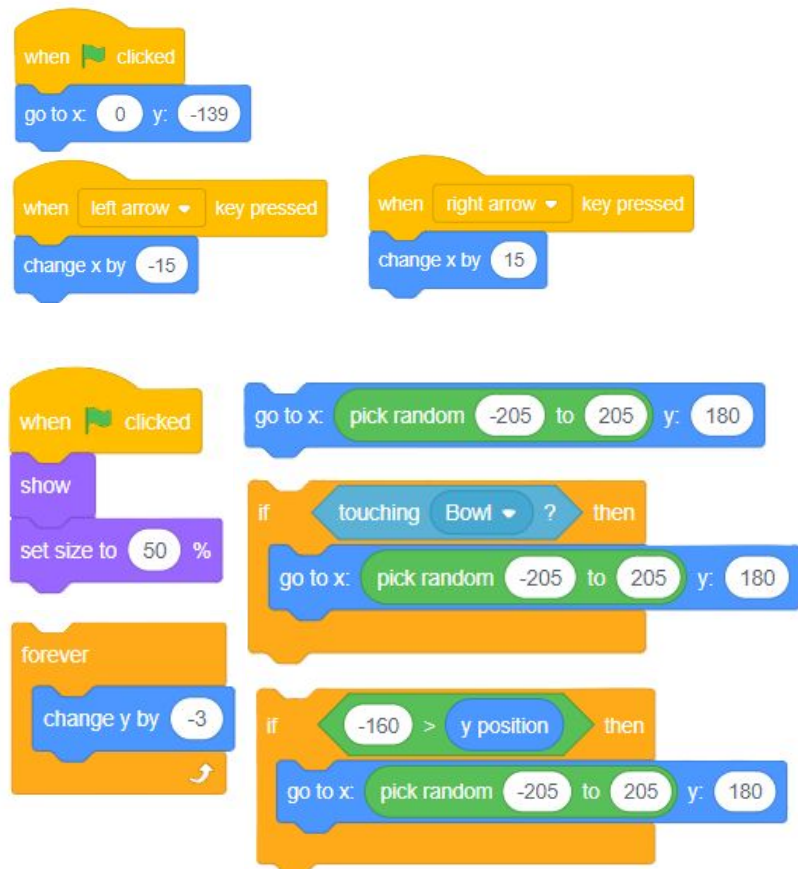
In the vast desert, there is a wise and humble monk named Kavi. Every day, he sets out on a journey with his wooden bowl to catch the apples falling from the sky, symbolizing gratitude and devotion to nature. Amidst the perennial sandstorms and harsh natural environment, Kavi's journey is a spiritual pursuit, connecting him with divine abundance.

Each time he catches an apple, it signifies a moment of gratitude and recognition of the blessings bestowed by the universe. His graceful movements express reverence for nature, turning a simple task into profound worship. For him, this journey is not just about catching apples; it's about finding beauty and abundance in the most challenging of environments. It's about learning to appreciate the simple joys of life and giving thanks for everything the universe provides.

As players join Kavi's pursuit, they too will learn these valuable lessons. They will strive together to catch as many apples as possible, not just to win but to experience the joy of gratitude and the richness of nature's miracles. Through their actions, they will understand that true wealth lies not in material possessions but in the richness of the soul and the beauty of the spirit.

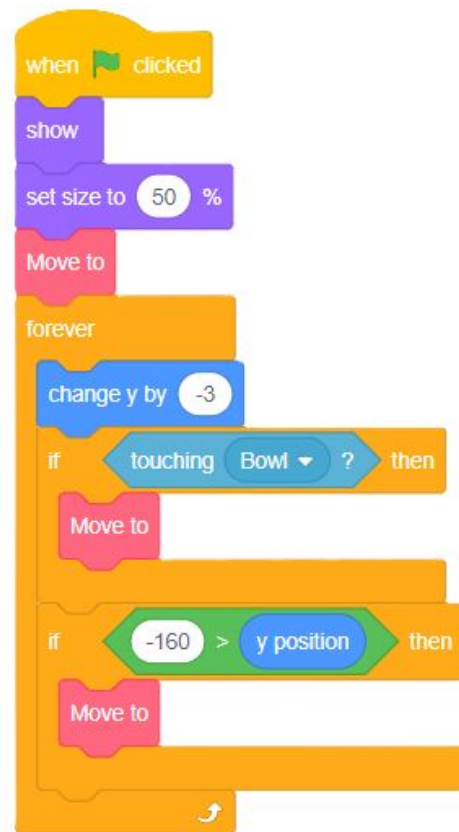
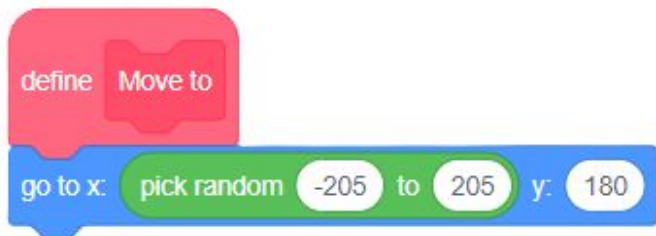
# Step 1

- Stage Background: Choose your own
- Characters: Apple and Bowl
- Bowl:
  - Placed at the bottom of the stage
  - Can be moved left or right using the keyboard's arrow keys
- Apple:
  - Show it and adjust the size
  - Position it at the upper part of the stage at a random x position
  - Let the apple fall from top to bottom
  - If caught by the bowl, reposition the apple to the top for another fall
  - If not caught, also reposition the apple to the top for another fall



## Step 2

- Bowl:
  - Can be directly controlled using the mouse to move left or right.
- Apple:
  - Move the action "Position it at the upper part of the stage at a random x position" from the previous step into a function block (named **Move to**). This will make it easier for us to reuse.



# Step 3

## Add sound effects:

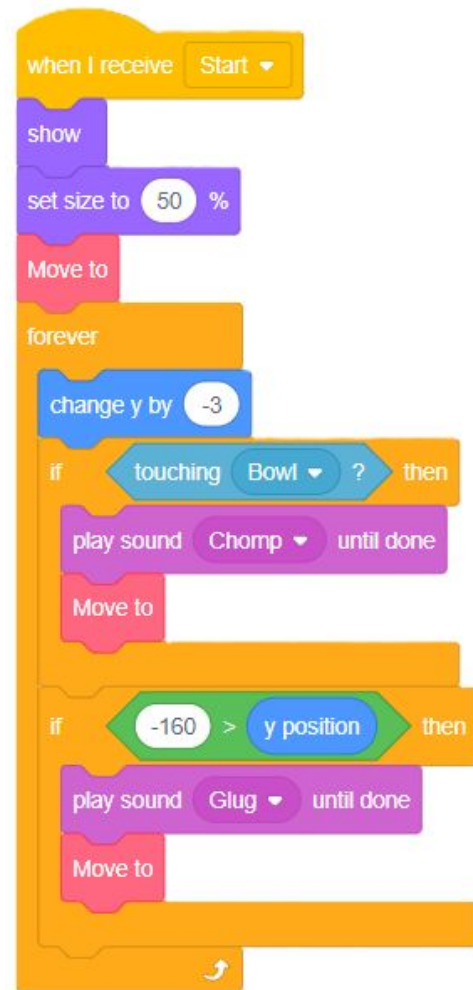
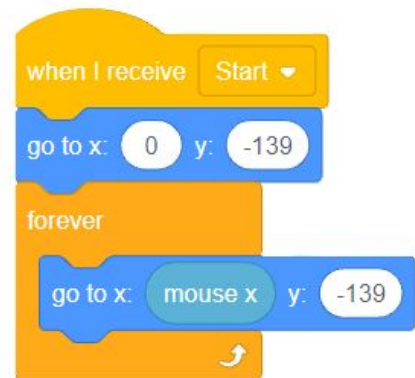
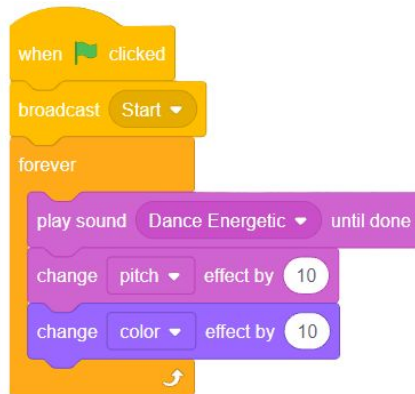
- Stage:
  - Choose a background music to continuously play throughout the game
  - As the game progresses, gradually increase the **pitch** of the music
  - Also, add graphic **color** effects on the stage background
- Apple:
  - When the bowl catches the apple, play a certain sound effect
  - When the bowl misses the apple, play another sound effect



# Step 4

Avoid using multiple  event blocks; instead, use broadcast messages

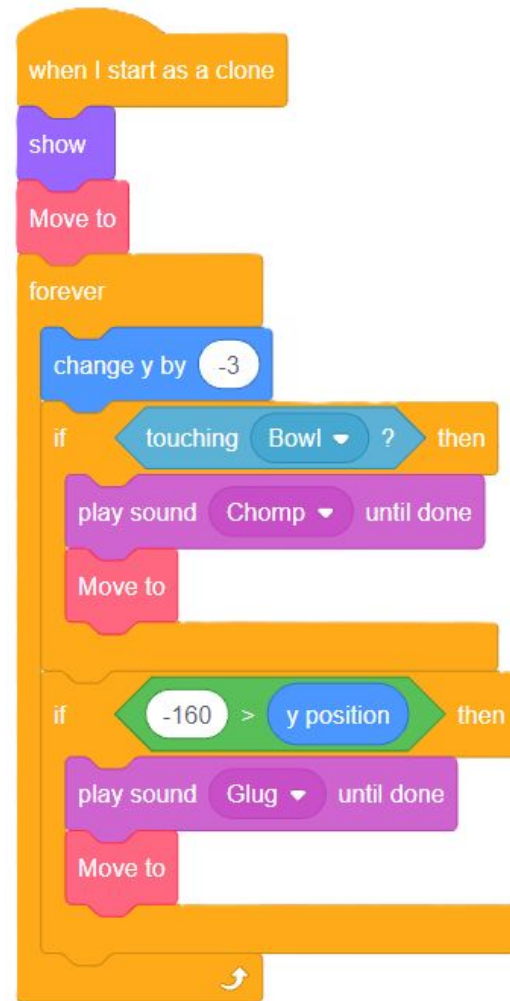
- Stage:
  - Keep the "When green flag clicked" event block on the stage
  - Inside it, broadcast a message (**Start**)
- Bowl:
  - Replace "When green flag clicked" with "When I receive message **Start**"
- Apple:
  - Replace "When green flag clicked" with "When I receive message **Start**"



# Step 5

## Generate apple clones:

- Apple:
  - Generate a total of 6 clones.

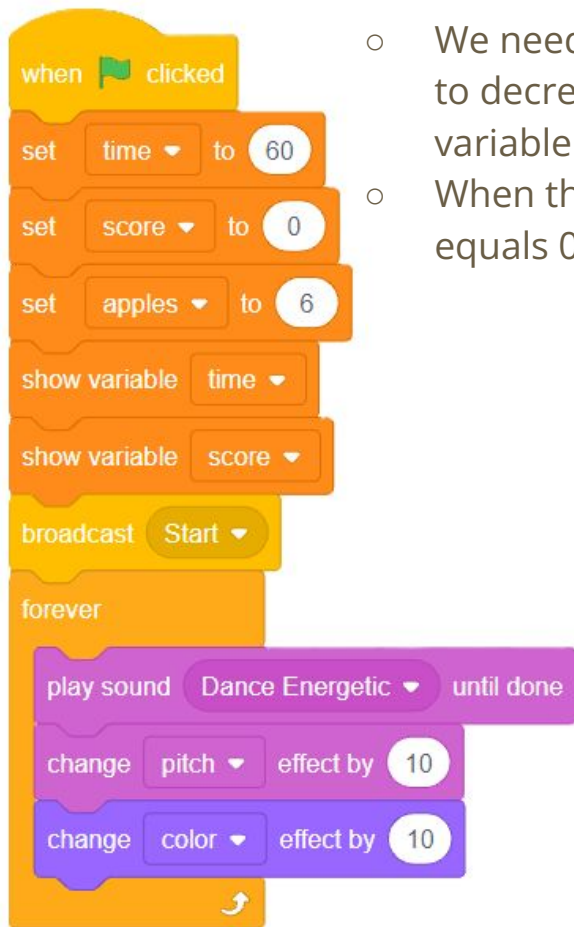




# Step 6

## Use variables:

- Stage:
  - Create variables **available to all sprites**:
    - **time**: Remaining game time
    - **score**: Score
    - **apples**: Number of apple clones
  - Set initial values:
    - **time**: 60
    - **score**: 0
    - **apples**: 6
  - Show the time and score variables



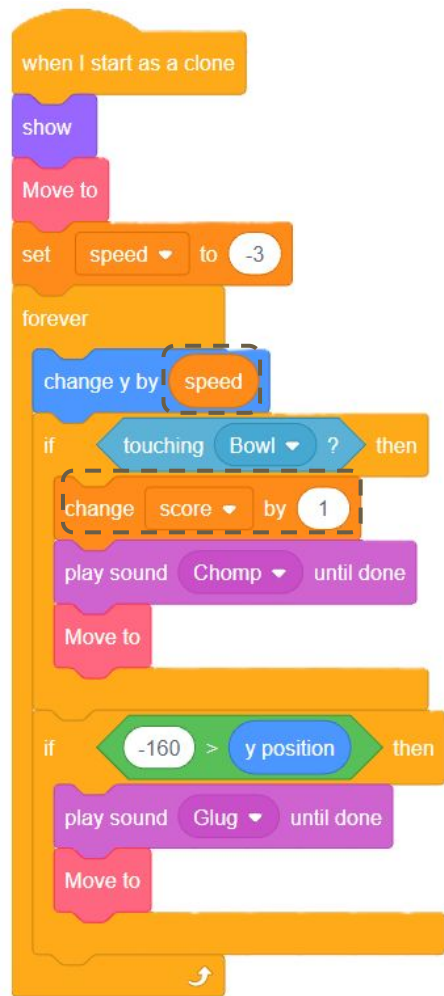
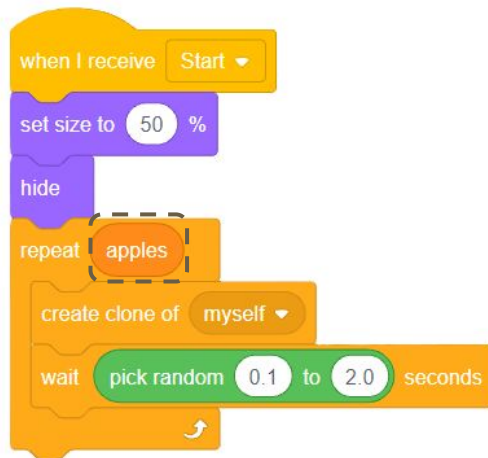
- We need a countdown timer to decrement the "time" variable by 1 every second
- When the "time" variable equals 0, we'll end the game



# Step 6

## Utilize variables:

- Apple:
  - Create a variable **for this sprite only** called "**speed**," representing the speed at which the apple falls
  - Set the initial value of "**speed**" to **-3**, which we can set when receiving the message "Start" or when the clone is generated. Here, we'll place it when the clone is generated
  - Use the "**apples**" and "**speed**" variables in the blocks
  - When the bowl catches the apple, add 1 to the score variable



# Step 7

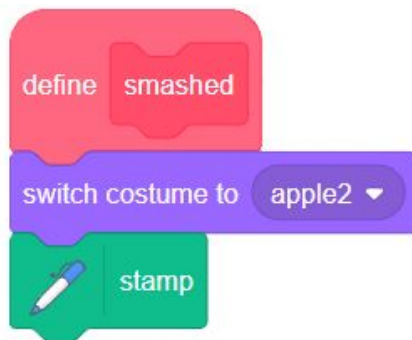
- Apple:

- Change the value of the "**speed**" variable from a fixed value of **-3** to a **random number between -3 and -6**
- When the apple returns to the top and falls again, also reset the value of the "**speed**" variable to a random value
- Define a new custom function block to replace the previous "**Move to**" block. This new block will contain above action of setting the "**speed**" variable
  - Add a numeric parameter called "**y-position**" to this custom function block, representing the y-coordinate where the apple appears, so we can adjust the y-coordinate of the apple's appearance
  - Name this custom function block "**Setup Apple with y-position=**"



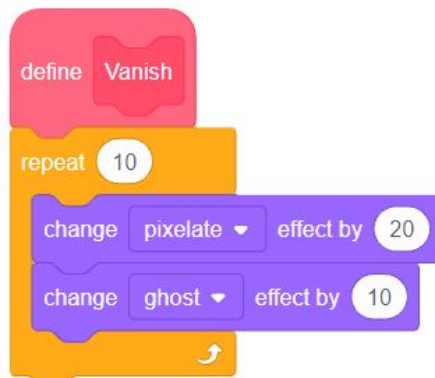
# Step 8

- Apple:
  1. When the bowl fails to catch the apple, we'll create a special effect with an image of a **rotten** apple, then reposition the apple to the top
    - Create a second costume (apple2) for the rotten apple
    - Use the pen **stamp** feature to place this image of the rotten apple at the bottom of the stage
    - We'll use a custom function block called "**smashed**" to accomplish this action
    - Remember to erase all pen marks at the beginning of the game



# Step 8

- Apple:
  2. Create an animation for the apple disappearing
  3. When the bowl catches or misses the apple, we'll display this disappearing animation, then reposition the apple to the top
    - We'll use a custom function block called "**vanish**" to accomplish this action
    - Use the graphic pixelate and ghost effects to achieve the animation



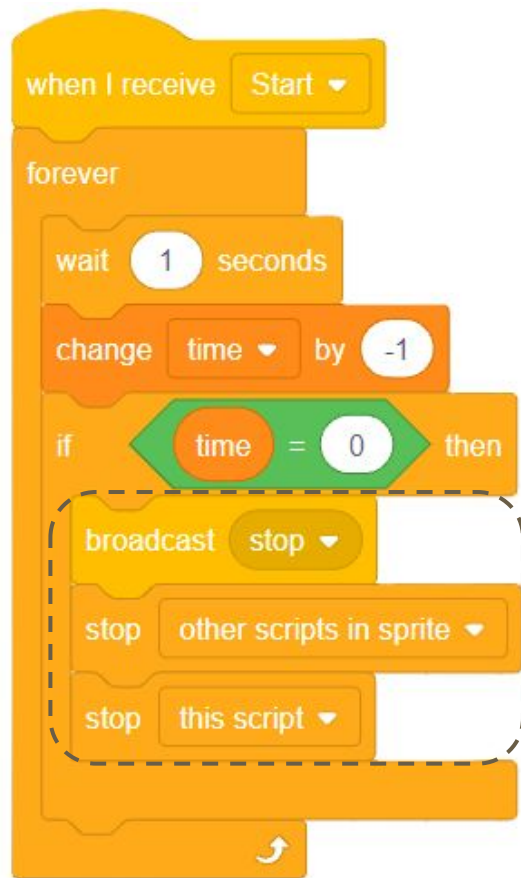
## Step 8

- Apple:
  4. Create an animation for the apple appearing
  5. When the apple reposition to the top and needs to be displayed again, show this appearing animation
    - We'll use a custom function block called "**appear**" to accomplish this action
    - Generate apples of different colors using the graphic **color** effects
    - Use the graphic **pixelate** and **ghost** effects to make the apple appear



# Step 9

- When the game ends, create a text animation for "**Game over**"
- Stage:
  - When the countdown timer "**time**" reaches 0, replace the existing **stop all block** with the following:
    - Broadcast message "**stop**"
    - **Stop other scripts in sprite** (to stop the forever block in "When green flag clicked")
    - **Stop this script** (to stop the forever block in itself)
- Apple and Bowl:
  - When receiving the broadcast message "**stop**," stop other scripts in this object.





# Step 9

- Create a new character called "**Mask**"
  - Create a costume consisting of a pure white background covering the entire stage
  - When the game starts, position it at the center of the stage, move its layer to the top, and then hide it
  - When the game ends, show it first, then adjust its transparency gradually from fully transparent (ghost effect = 100) to semi-transparent (ghost effect = 50).





# Step 9

- Create a new character called "**GameOver**"
  - Create a costume containing the text "**Game over!**"
  - When the game starts, position it at the center-left of the stage and hide it.
  - When the game ends:
    - i. Move its layer to the top and show it
    - ii. Choose an end sound effect to play
    - iii. While playing the sound effect, move the "Game Over!" text to the center of the stage
    - iv. Stop other scripts in sprite

