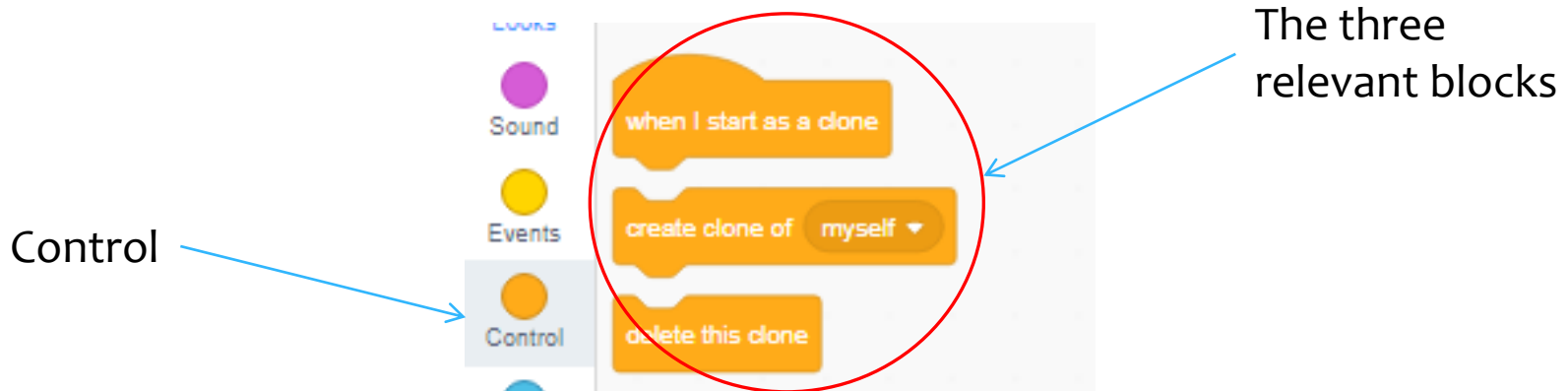# Sprite plays the shooting game! (The concept of cloning)

Vineet Srivastava

So, what is cloning

* A block, which allows us to create many copies of a sprite. You can think these are like the twins of the sprite. There are three relevant blocks for cloning in the CONTROL section.

Control

The three relevant blocks

WIBYTE

Let's start with an example

* Say we want to build a shooting sprite which can shoot a lot of bullets.
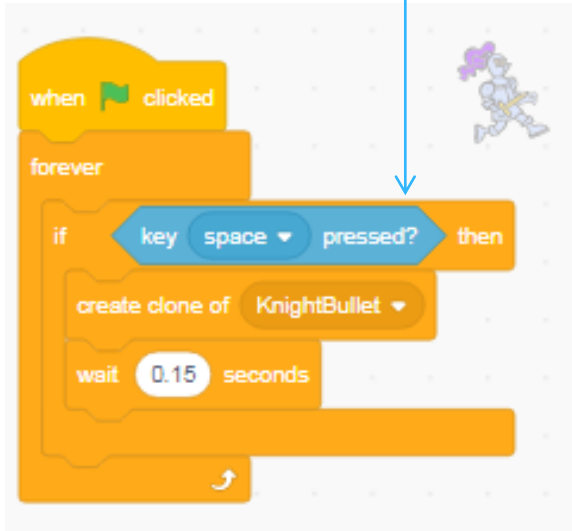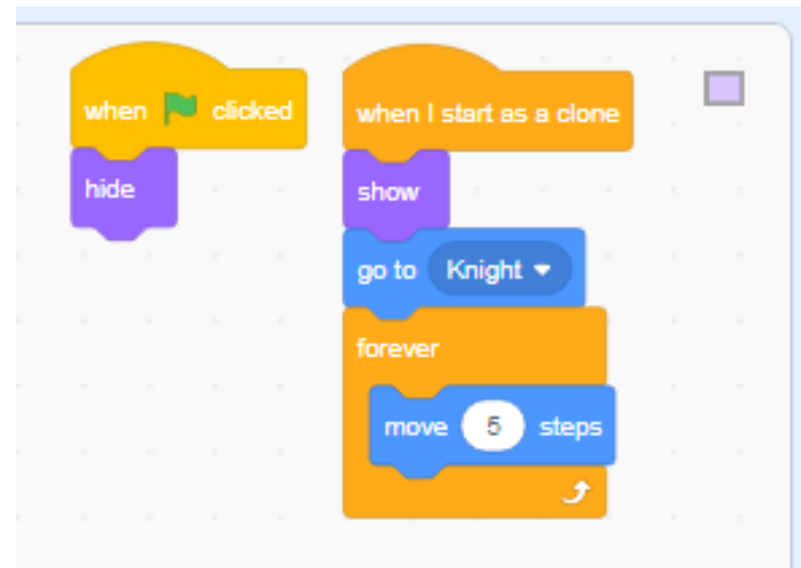
WIBYTE

Create Knight and KnightBullet sprites
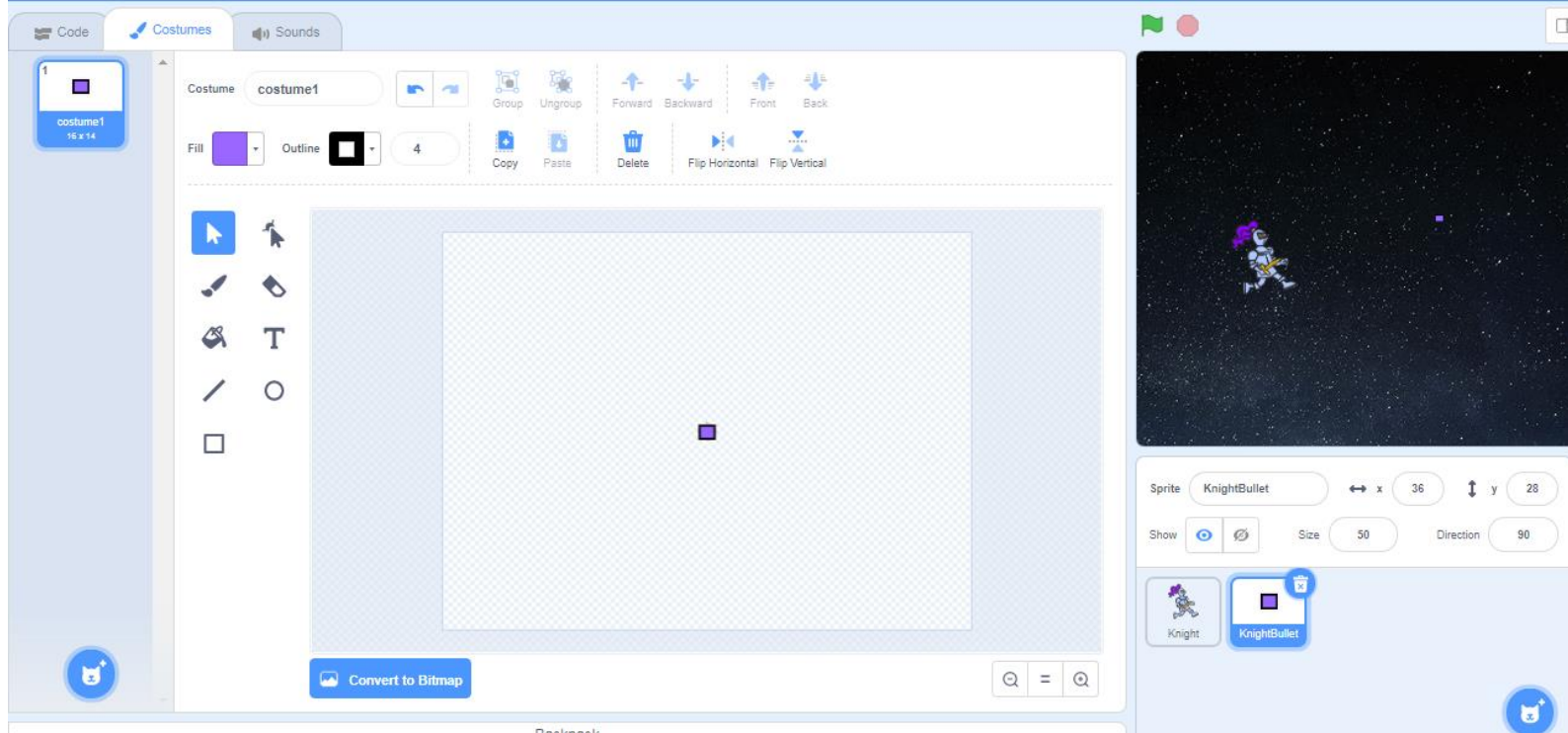
Knight is a built-in sprite, knight bullet we painted. Make sure the painted sprite is in the centre of the canvas.

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WIBYTE

Getting Knight to shoot bullets

After the flag is clicked, If I click SPACE bar, Create a CLONE of the sprite 'KNIGHT BULLET'

When a CLONE is created, make it go to the KNIGHT and then move.

Every time the space bar is clicked, the 'knight' appears to shoot a new bullet.

WIBYTE

Speed of the bullets

* We can control the speed of the bullets using a variable.

With this variable, we can control how fast (how many steps) the BULLET moves

Note, this is NOT a new loop. Just a replacement of 10 with the variable knight bullet speed.

WIBYTE

DELETE the clones too

* We need to *add* code to delete the clones. Notice, we have added code to delete the clone when reaching the edge.


One the sprite reaches the 'EDGE', delete the clone.

This is extremely important as every clone takes up memory. If we do not delete them, eventually the program will crash.

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WIBYTE

A point of caution

* Notice, in the previous slide, we have added the code to delete the sprite.
* One common mistake students make is that when they bring in the sprite first, it is 'already' near the edge.
* Hence, when the clone is created, the clone immediately gets deleted, and it looks like the clone never got created.
* Simple remedy is to ensure that the sprite is not touching the edge when you first create it.

WIBYTE

Moving the knight

* Use UP and DOWN Arrows to move the knight.
* Use a variable 'knight speed' to control HOW fast the knight moves.

WIBYTE
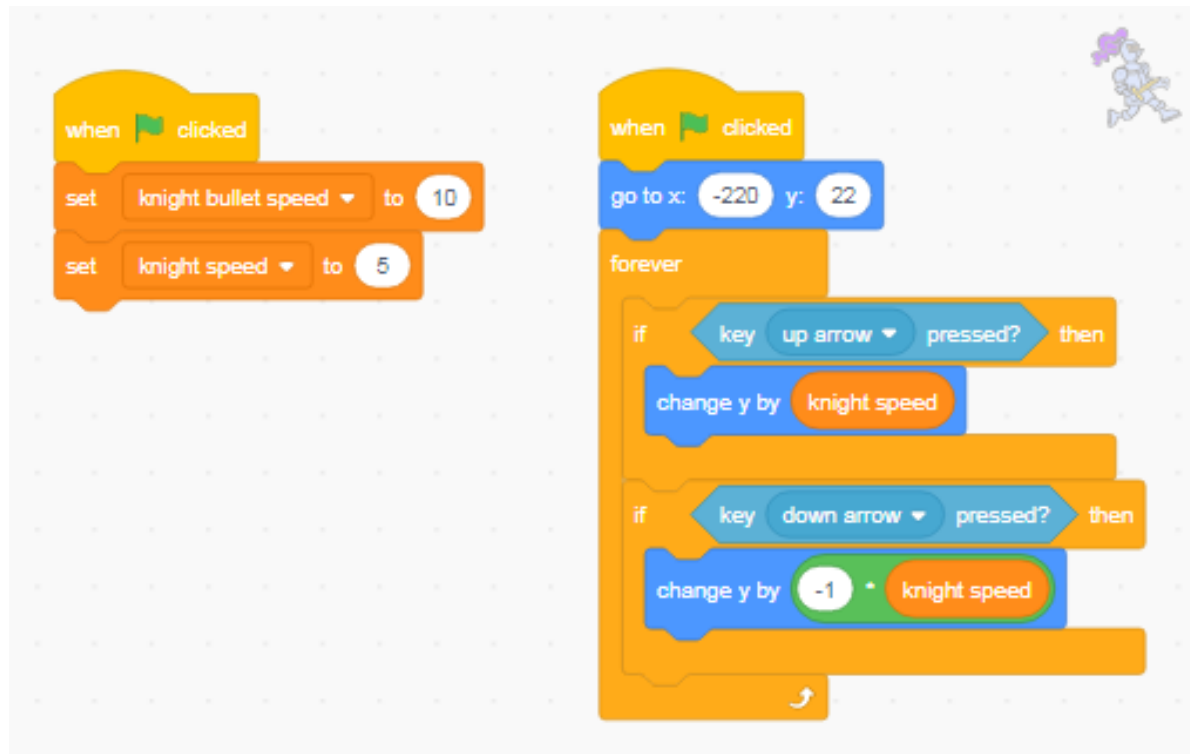
Add Knight's Enemy – A retro robot
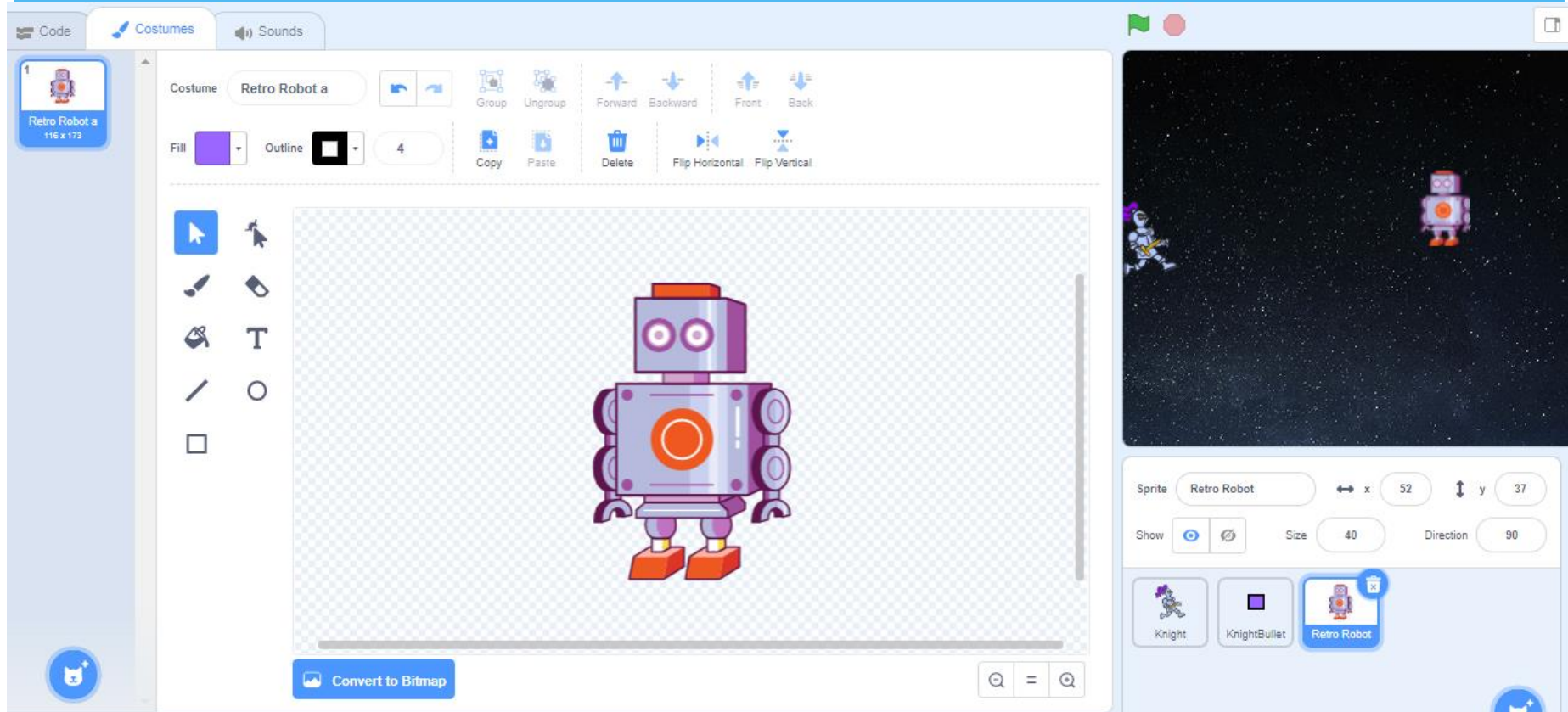
Note: We changed the SIZE to 40%, and used FLIP HORIZONTAL to make the Retro Robot face the knight.
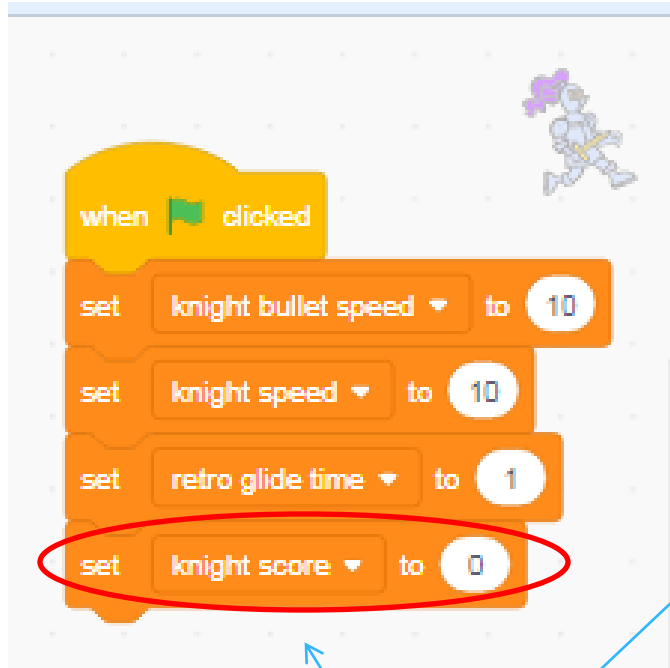
WIBYTE

Code to move Retro Robot

* Every 'retro glide time' sec, it glides to a 'random' Y position.
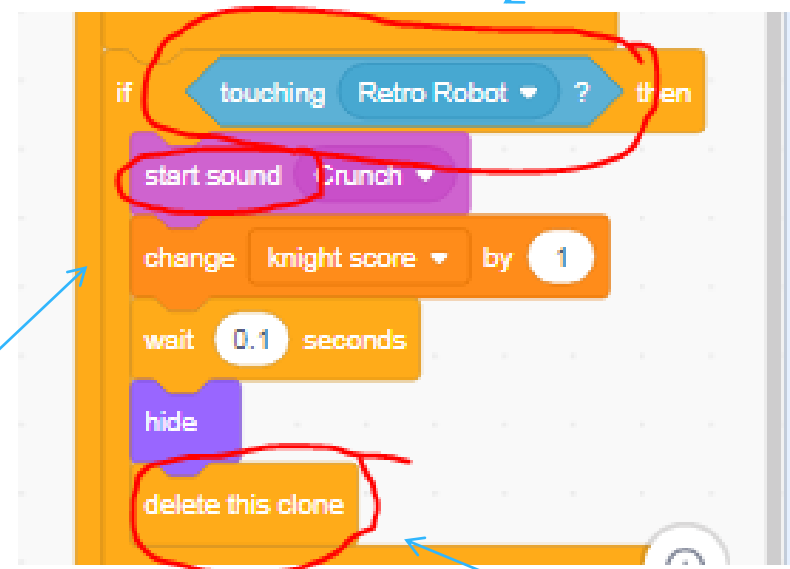* The smaller the 'Retro Glide Time', the faster the movement of the retro robot. .

WIBYTE
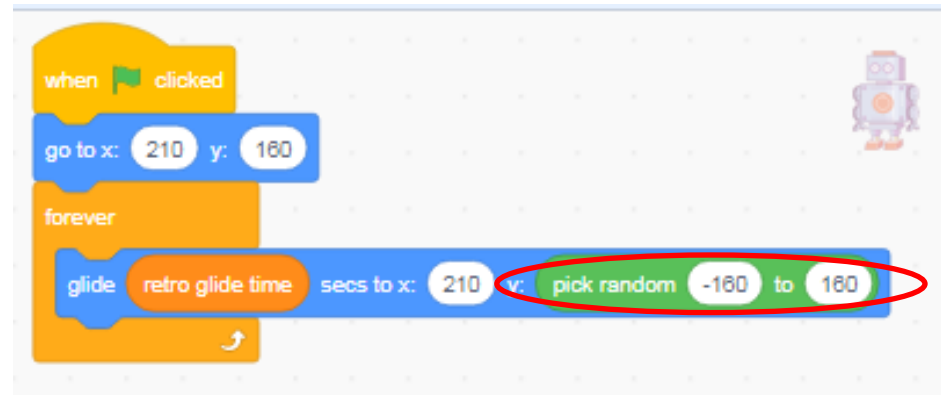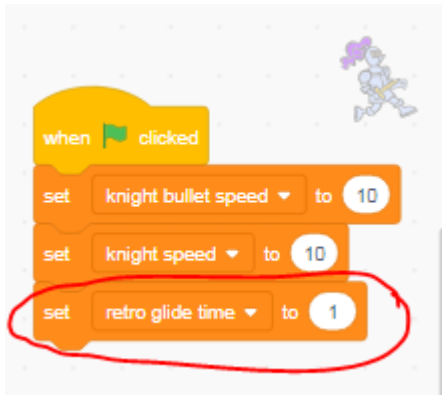
Keeping track of the score

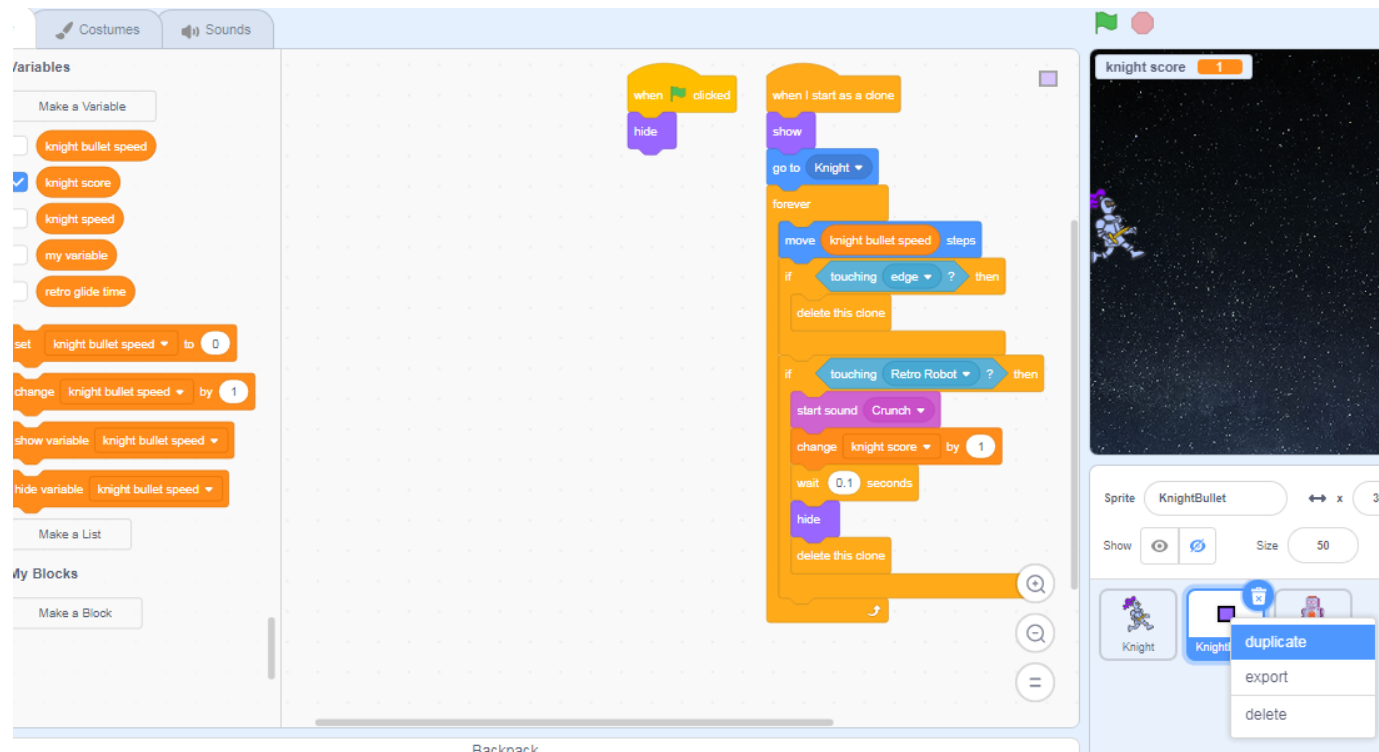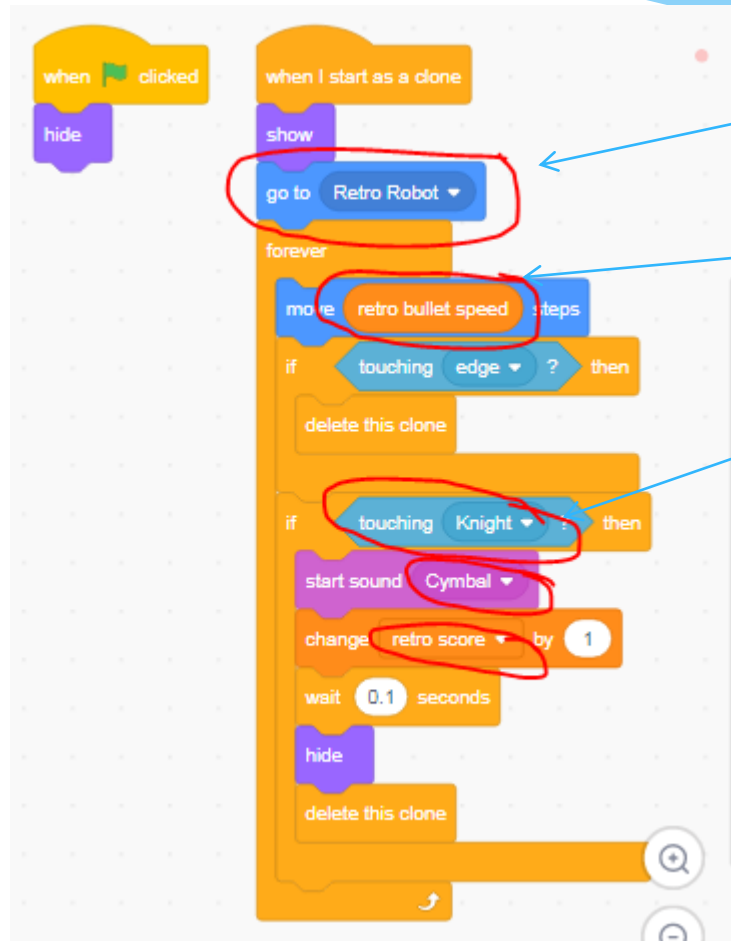Add this to the KnightBullet code

If the bullet hits RETRO

Variable

Remember to delete

WIBYTE

Let's give some ammunition to RETRO also

* Duplicate the Knight Bullet Sprite and give it a new costume and name.
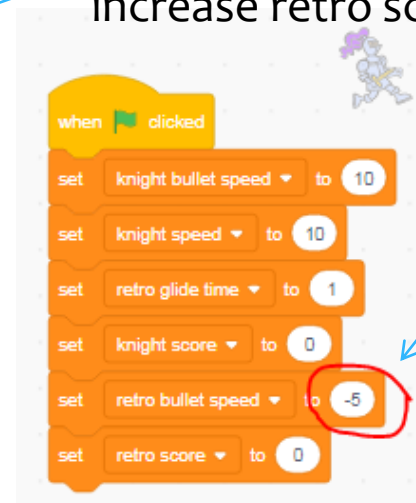
WIBYTE

Make changes to the RETRO BULLET CODE

On becoming a clone, go to RETRO ROBOT
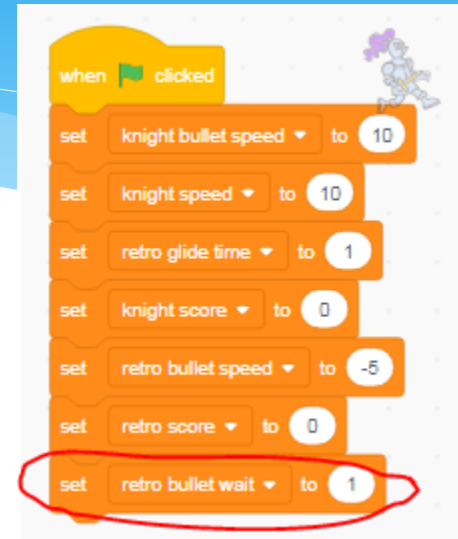
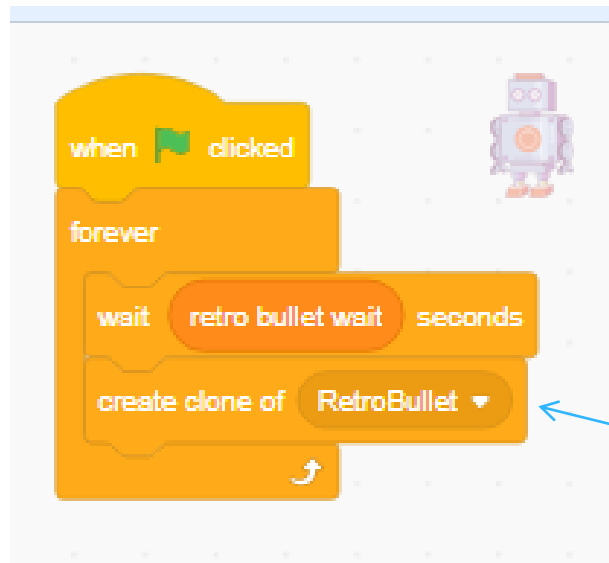Move according to RETRO ROBOT speed.

If touching knight, increase retro score.

Negative, because RETRO BULLET must move LEFTWARDS

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WIBYTE

Creating clones of RETRO BULLET

* Make retro robot fire a bullet every ' retro bullet wait' seconds.
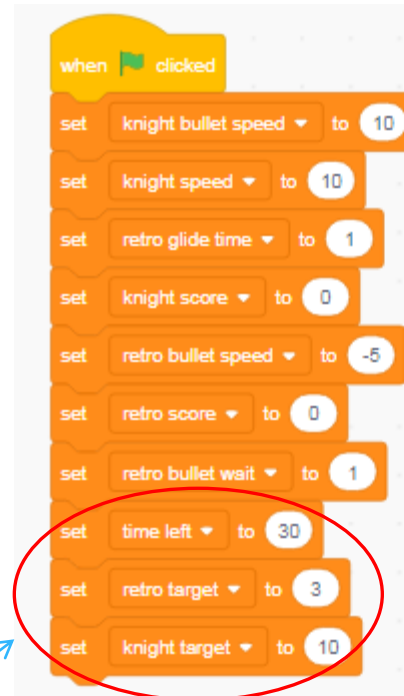

Variable added

Every 'retro bullet wait' seconds, Create a clone of RetroBullet.

WIBYTE

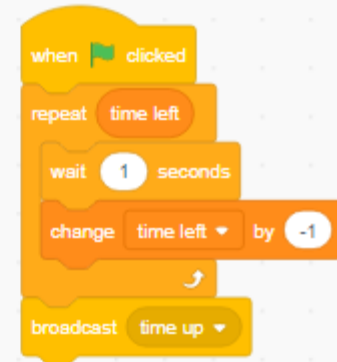# Coding the ENDING Conditions

* Game gets over in one of these three events:
  * Time gets over – Nobody won
  * Knight got hit too many times – Retro won
  * Retro got hit too many times – Knight won.

WIBYTE

Implementation

RETRO REACHED ITS TARGET AND WON

KNIGHT REACHED ITS TARGET AND WON
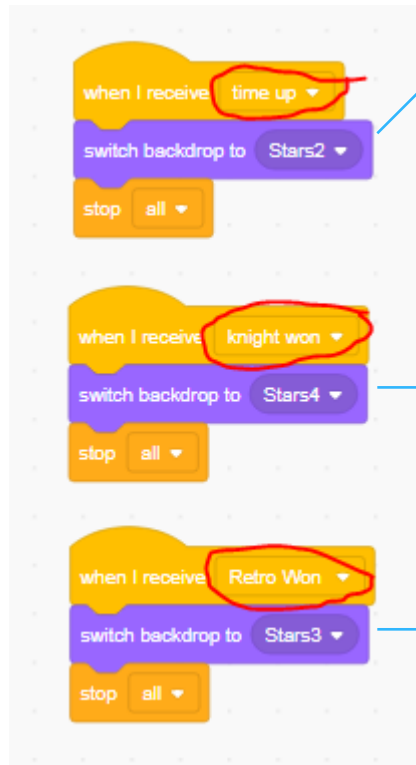
TIME OVER

Relevant Variables

WIBYTE

Receiving Ending Broadcast messages

And you are all set!

* This is a very very simple shooting game, built mostly to illustrate the concepts.

* There are many variations you can add, for example, creating an army of robots, pointing the robots' shots towards the shooter and so on.

* Try these and more in your independent activity.

WIBYTE

Extra Innings

WIBYTE

Just in case,
Cloning is NOT the same as STAMPING

* Previously (in Class 6) we saw that in the PEN block, we have a STAMP option.

* STAMP creates a 'stamp' of a sprite.

* This is different from cloning, as CLONE is like 'a real working' sprite, not just its picture or stamp.
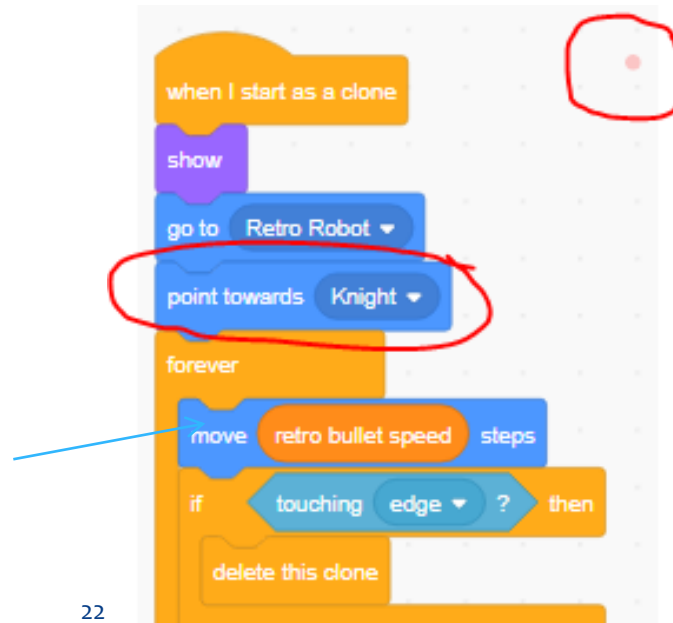
* This mean, clones can do stuff for us.

WIBYTE

Ideas to make your game more difficult (1)

* Make the retro bullet point in the direction of the KNIGHT using
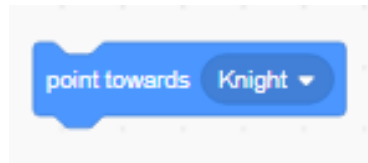
Note: For this, RETRO BULLET SPEED must be made more than 0. This is unlike earlier when we did not touch the direction of the bullet and hence had to make it move <negative> number of steps

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WIBYTE

Ideas to make your game more difficult (2)

* Make **More** shooting robots.
  * Duplicate RETRO BULLET and RETRO ROBOT sprites and give them new costumes.
  * Remember to update the conditions.

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WIBYTE

Ideas to make your game more difficult (3)

* Create an army of robots that MOVE towards the Knight.
  * CLONE the retro robot (not the retro bullet).
  * When it starts as a clone, move towards the Knight.

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WIBYTE

Ideas to make your game more difficult (4)

* Add obstacles.
  * You can add some sprites in the middle that act like obstacles. Perhaps they can block the knight's bullets for example.

WIBYTE