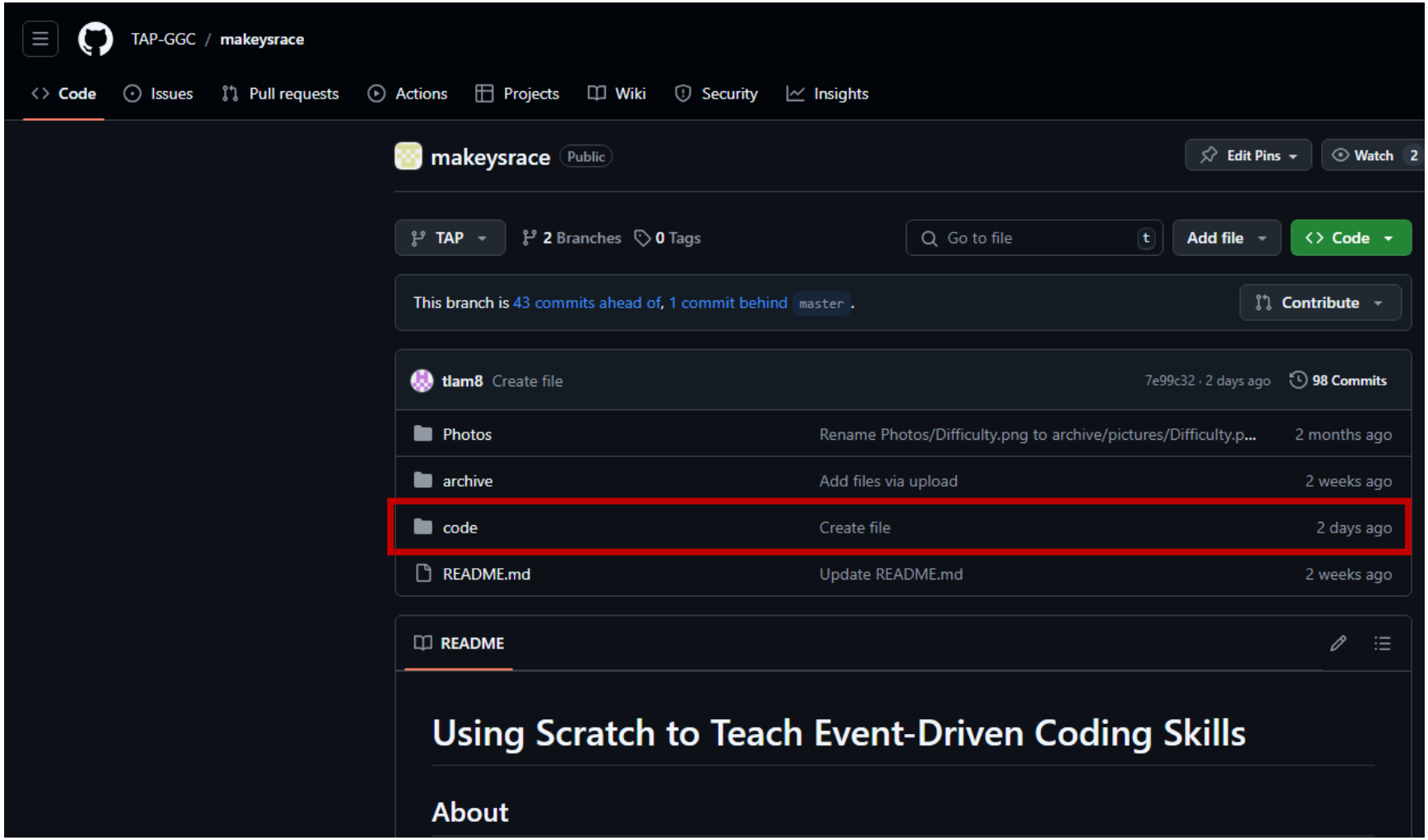
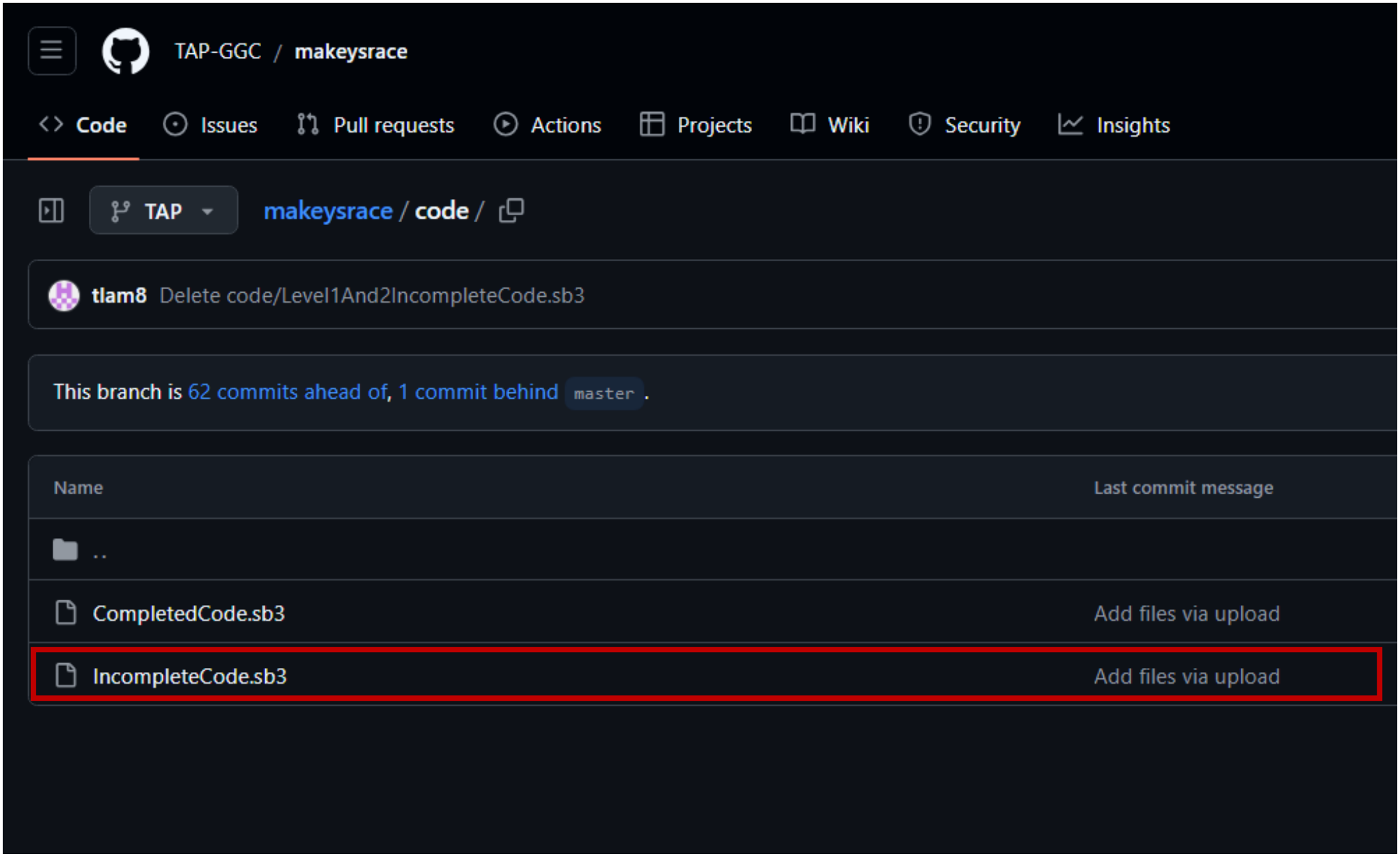
Using Scratch to Teach Event-Driven Coding Skills

Step-by-Step

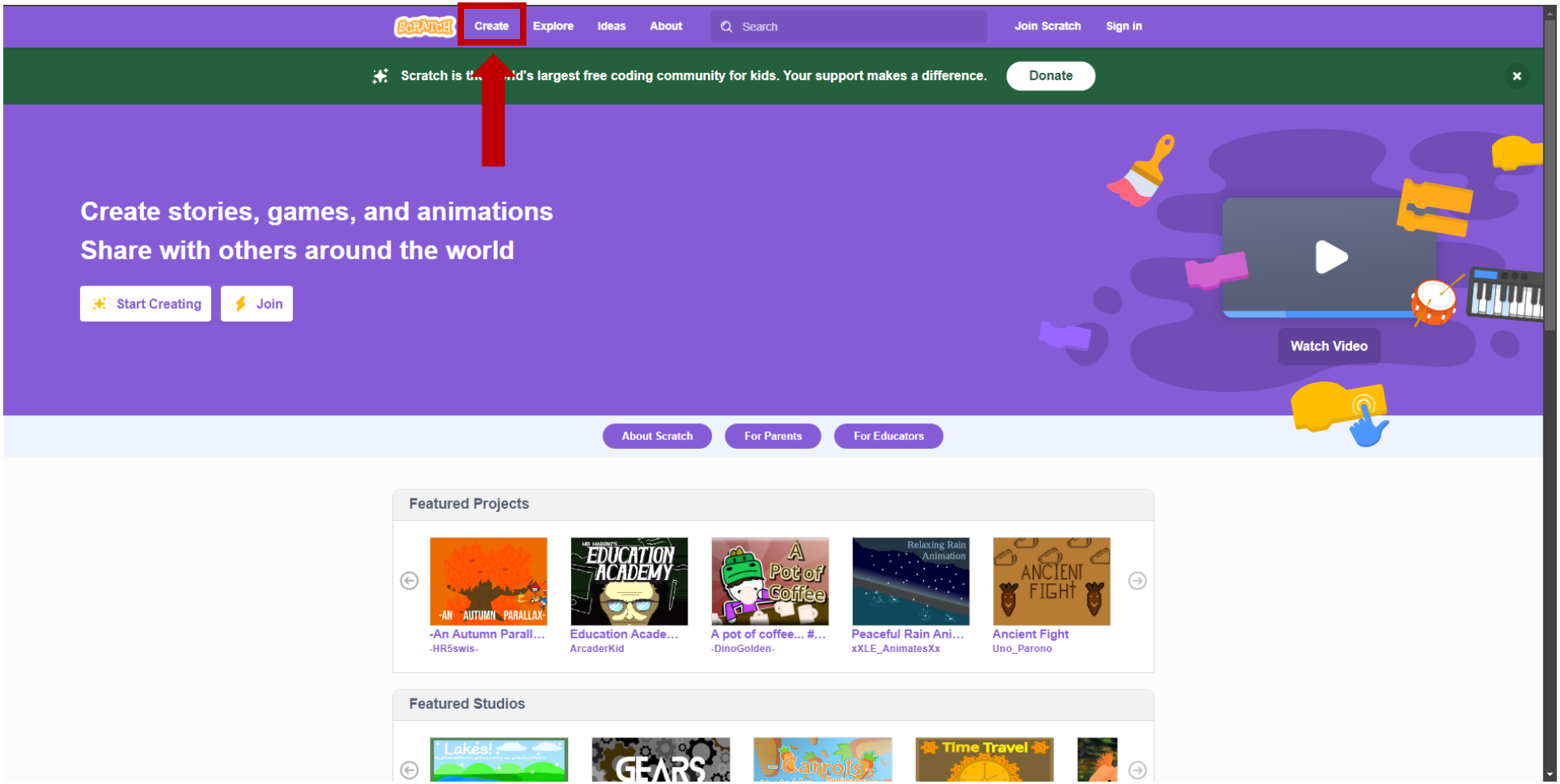
https://tapggc.org/

Start by going to https://github.com/TAP-GGC/makeysrace. Then click on the code folder and select the incomplete code. This will contain all 3 levels of the game.

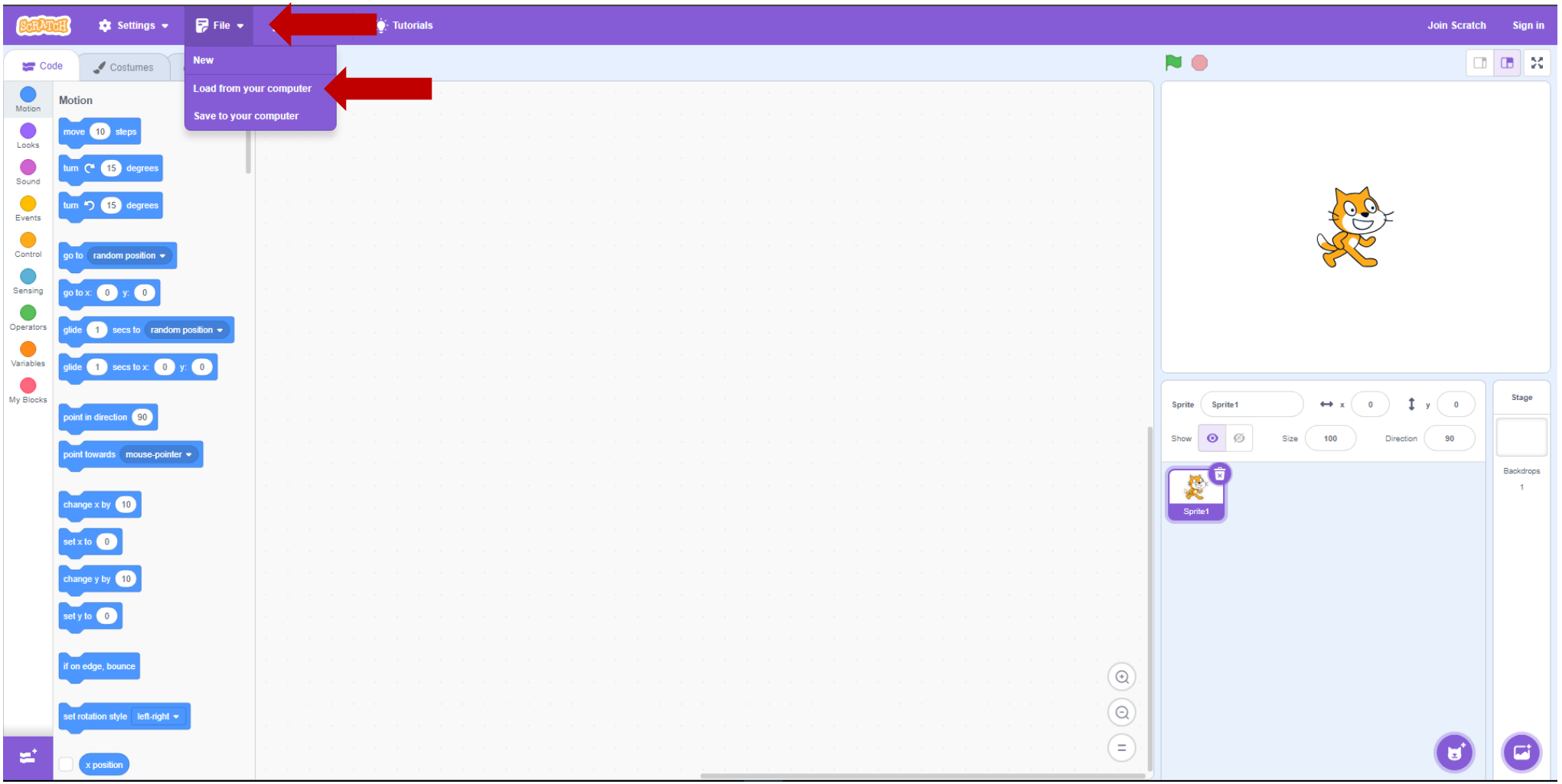



TAP-GGC / makeysrace
Code
Issues
Pull requests
Actions
Projects
Wiki
Security
Insights
TAP
makeysrace / code /
tlam8 Delete code/Level1And2IncompleteCode.sb3
This branch is 62 commits ahead of, 1 commit behind master.
Name
Last commit message
..
CompletedCode.sb3
Add files via upload
IncompleteCode.sb3
Add files via upload

After you download the file, go to https://scratch.mit.edu/ and then click on create.

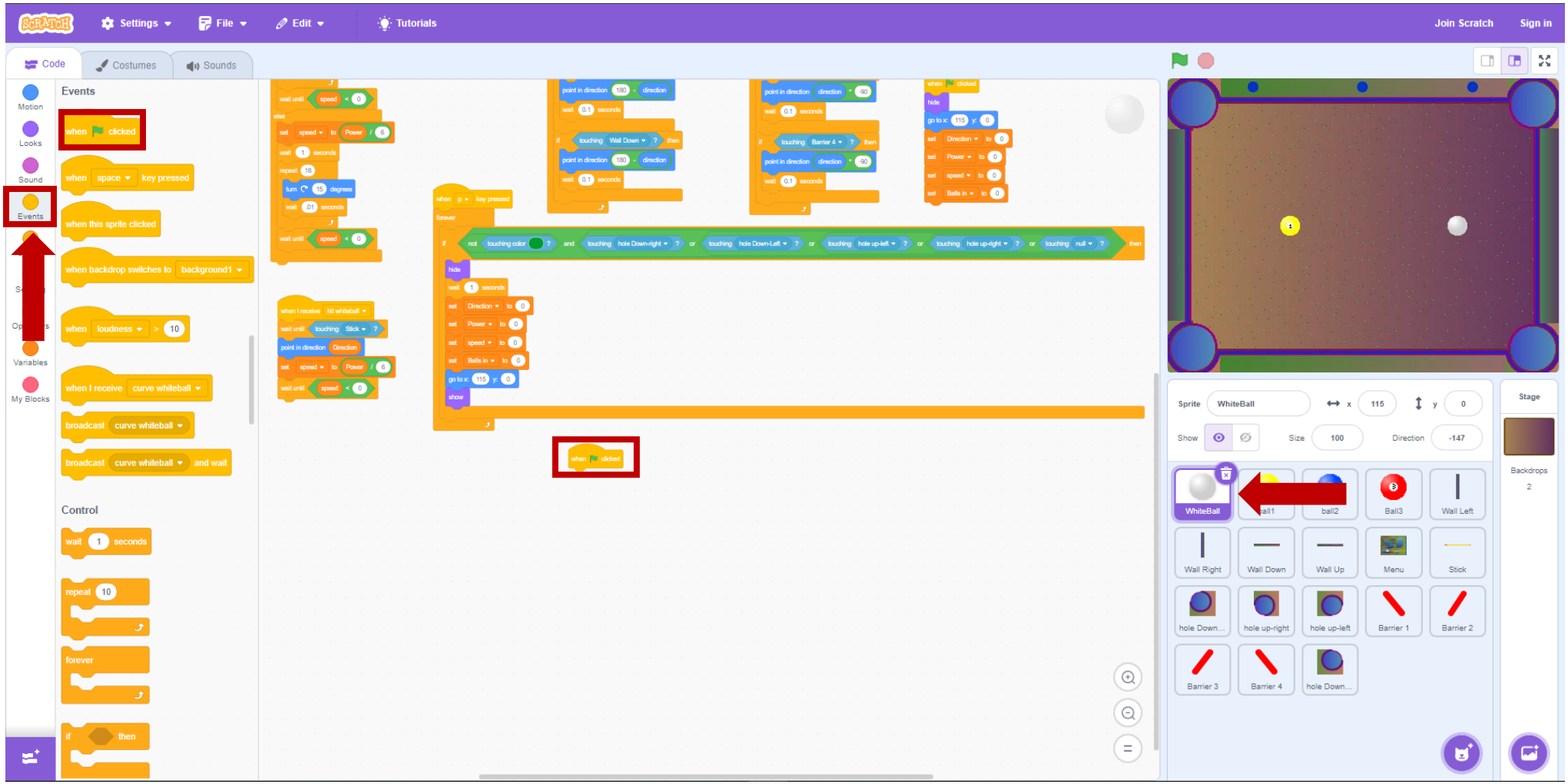


Now click on “file” and then “Load from your computer.” Then select the file that was just downloaded from GitHub. It should be called “IncompleteCode.sb3”.

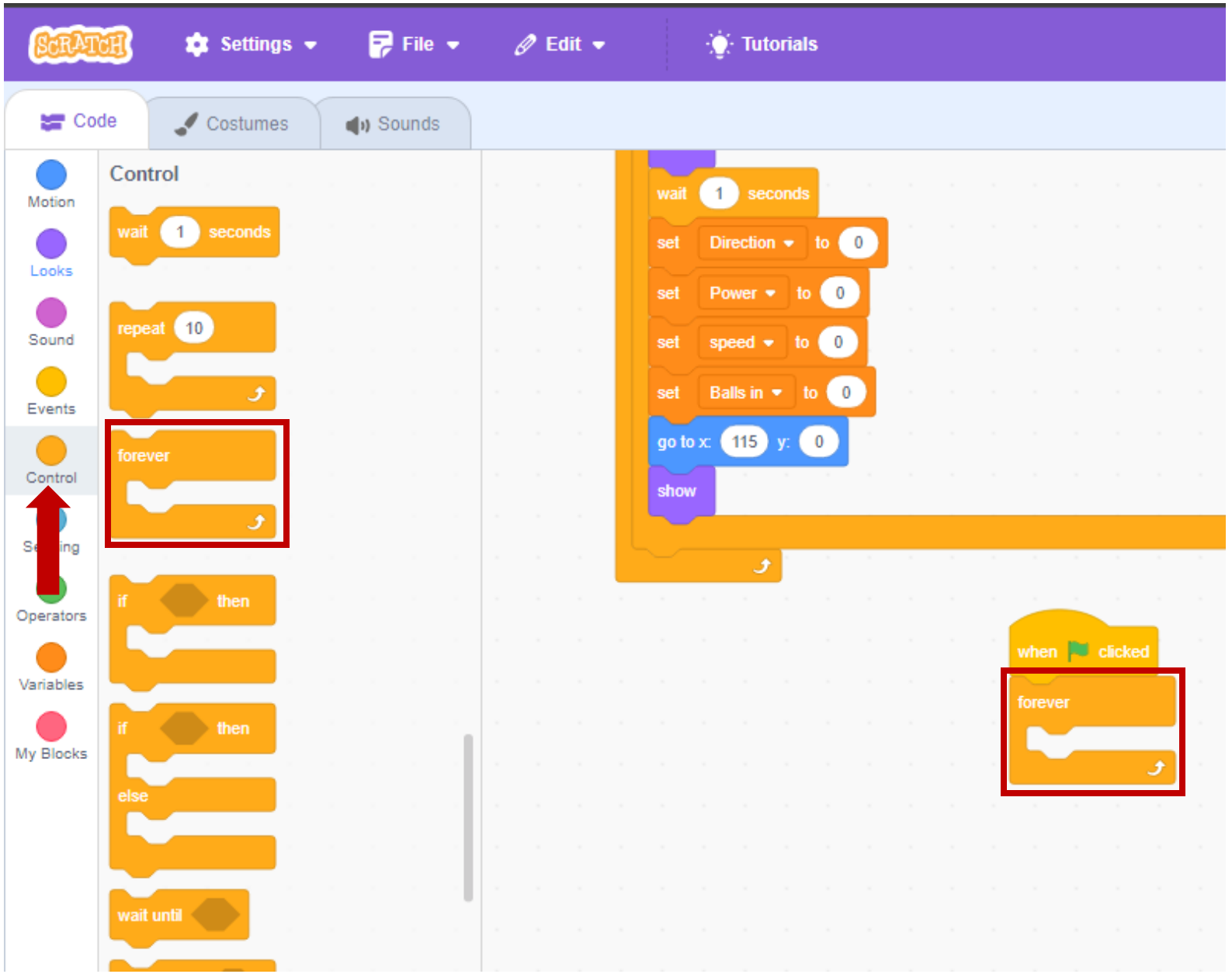


<u>This section will cover level 1 of the game.</u>

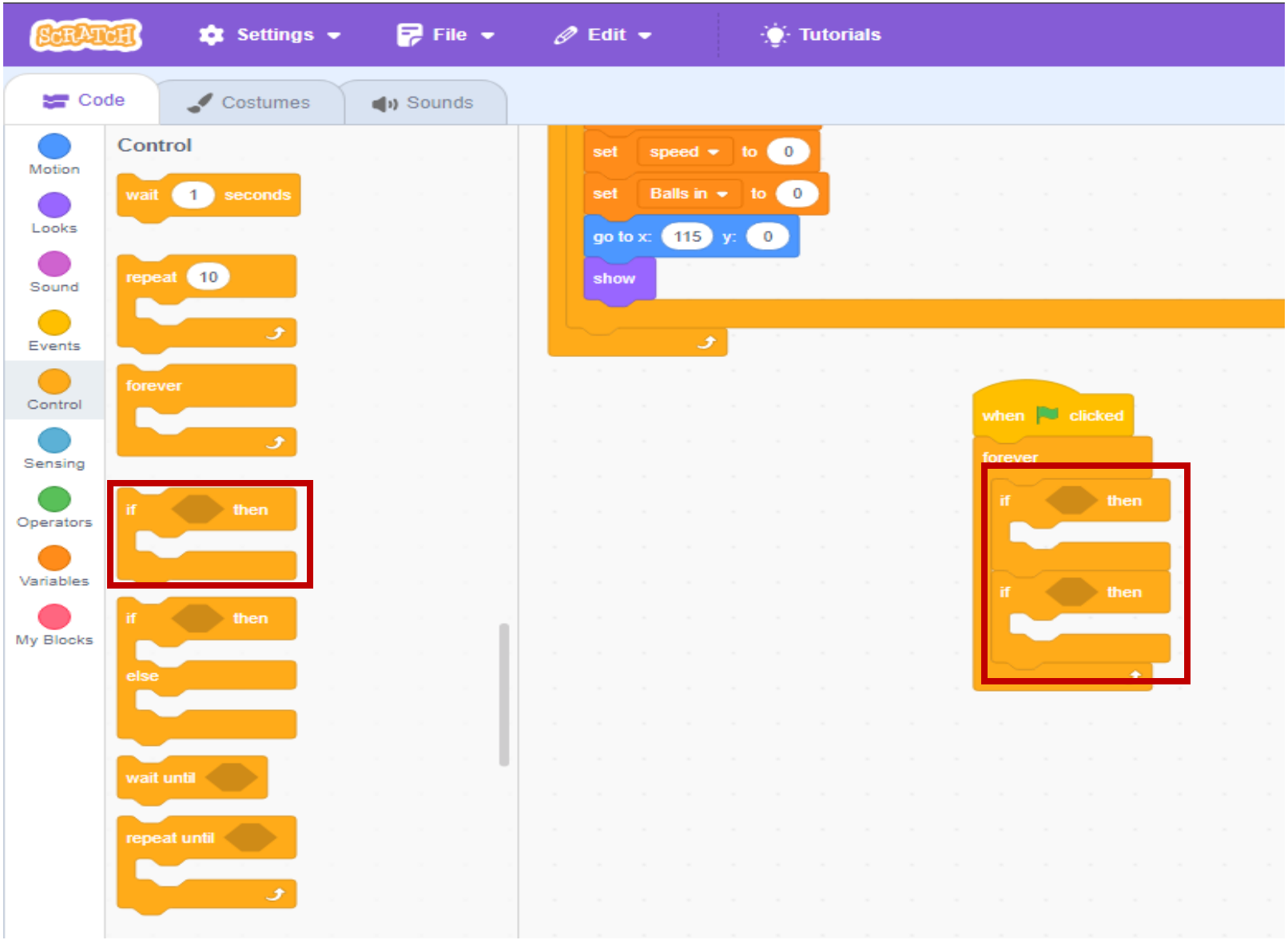
Make sure that the white ball is the selected sprite. Now click on “Events” on the left side of the screen. Then click and drag the “when flag clicked” and drop on an empy space on the canvas.



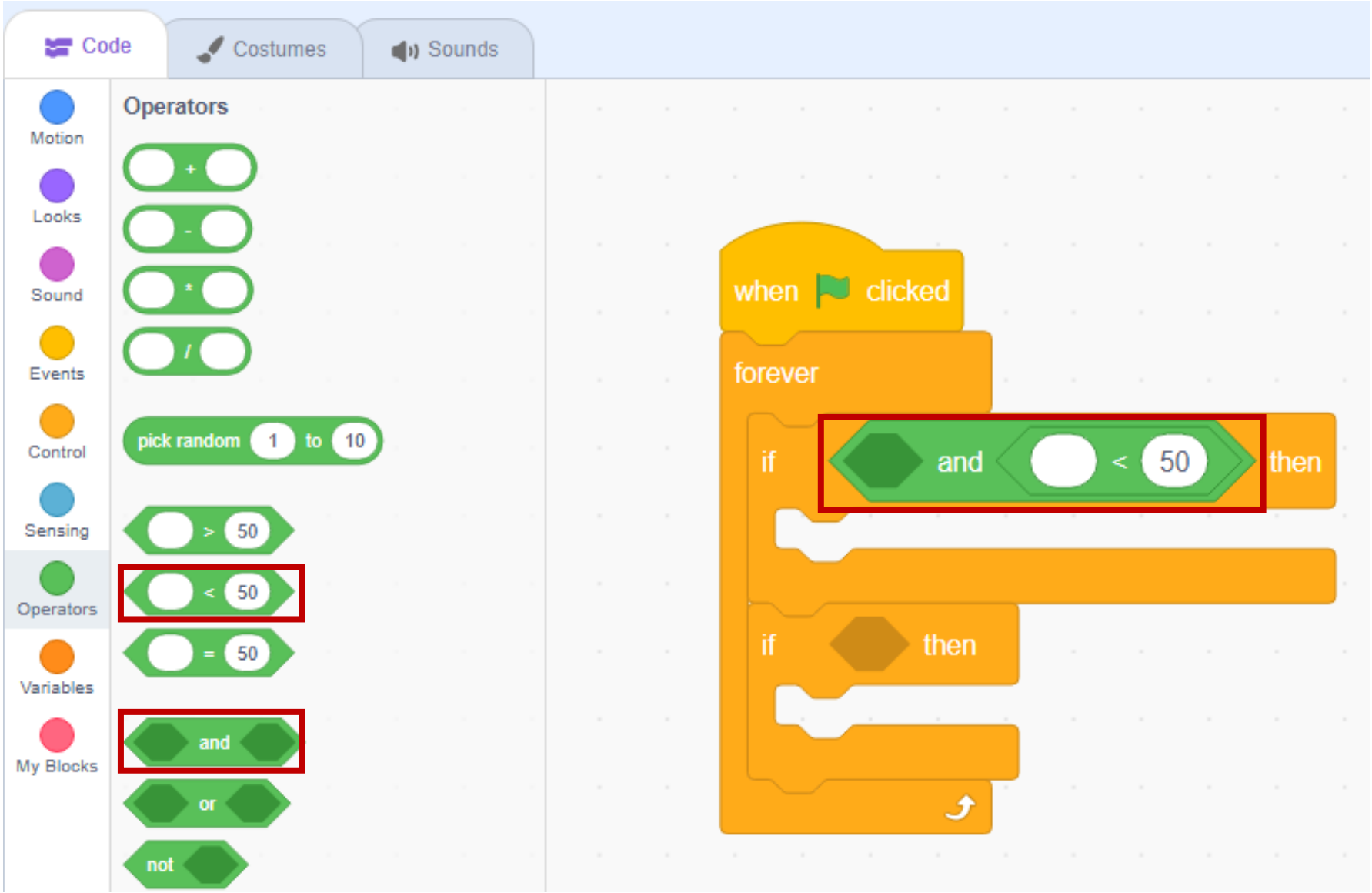
Now go to “Control” and grab the “forever” loop and attach it to code block.



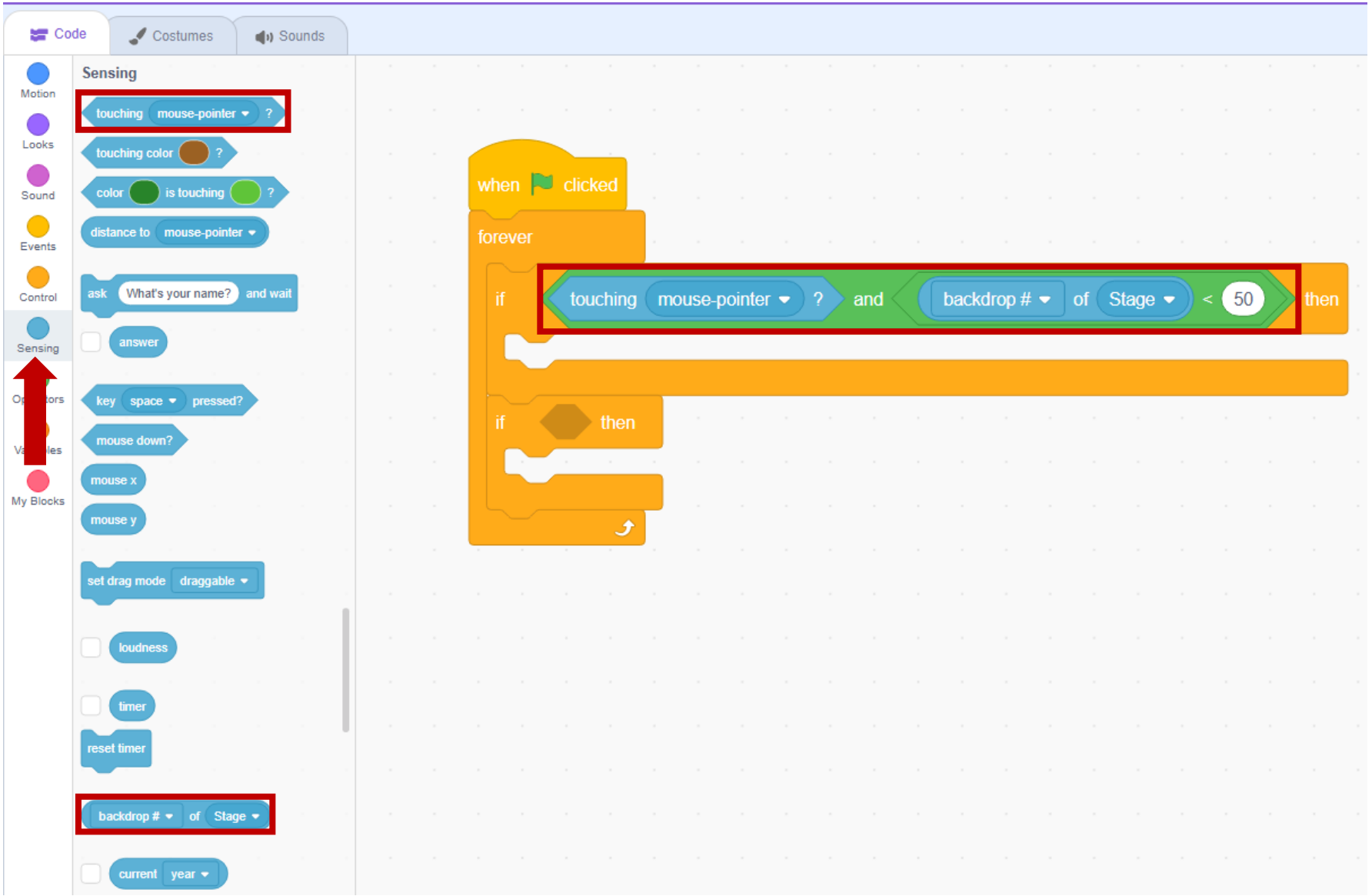
Now grab 2 “if-then” blocks and put them into the “forever loop” like shown below.

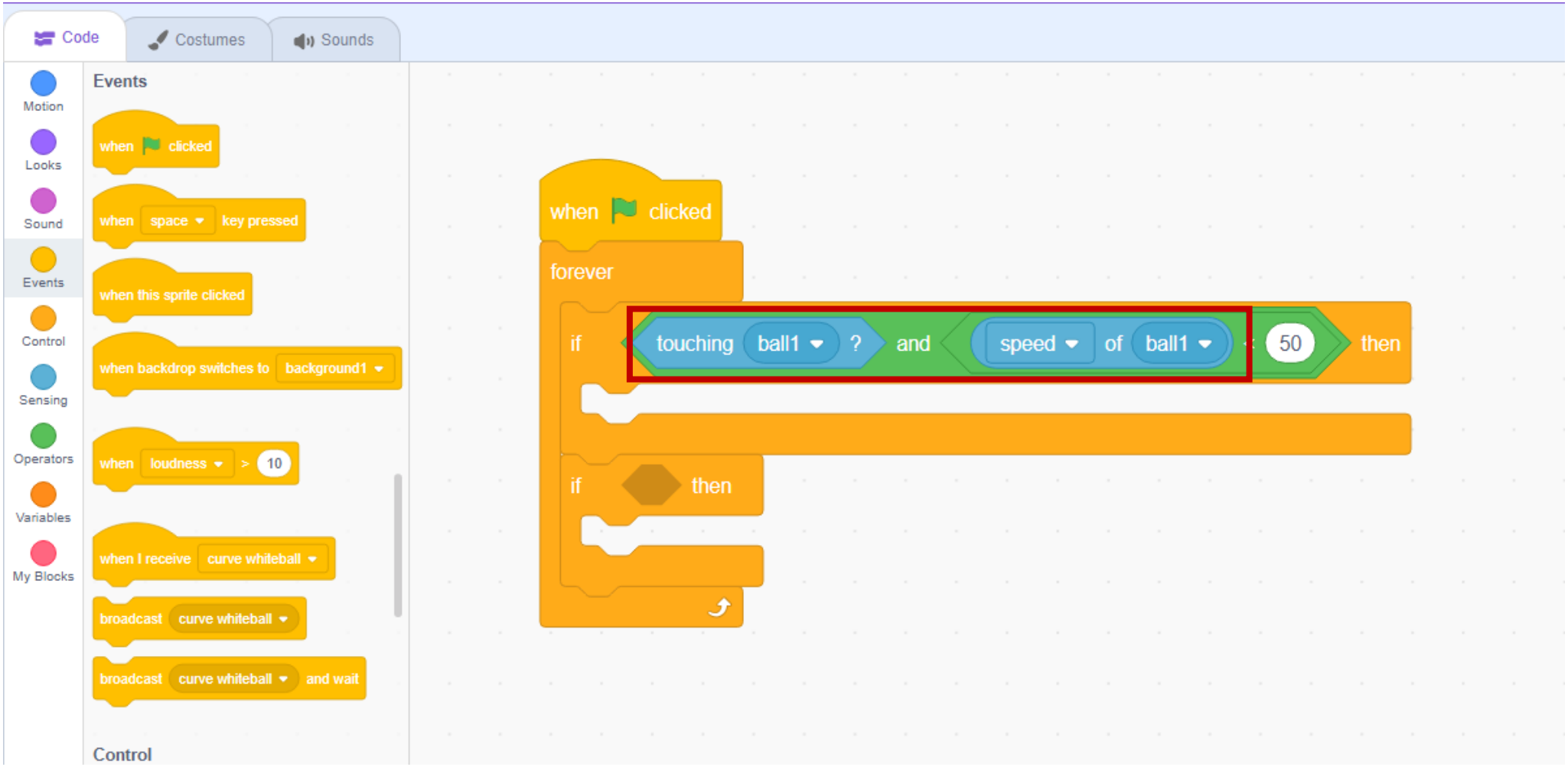


We will focus on the top “if-then” block for now. Go to “Operators”. Then grab the “__ and __” block and put it into the blank in the “if-then” block. Then grab the “__ < 50” block and put it into the second blank of the “__ and __” block.

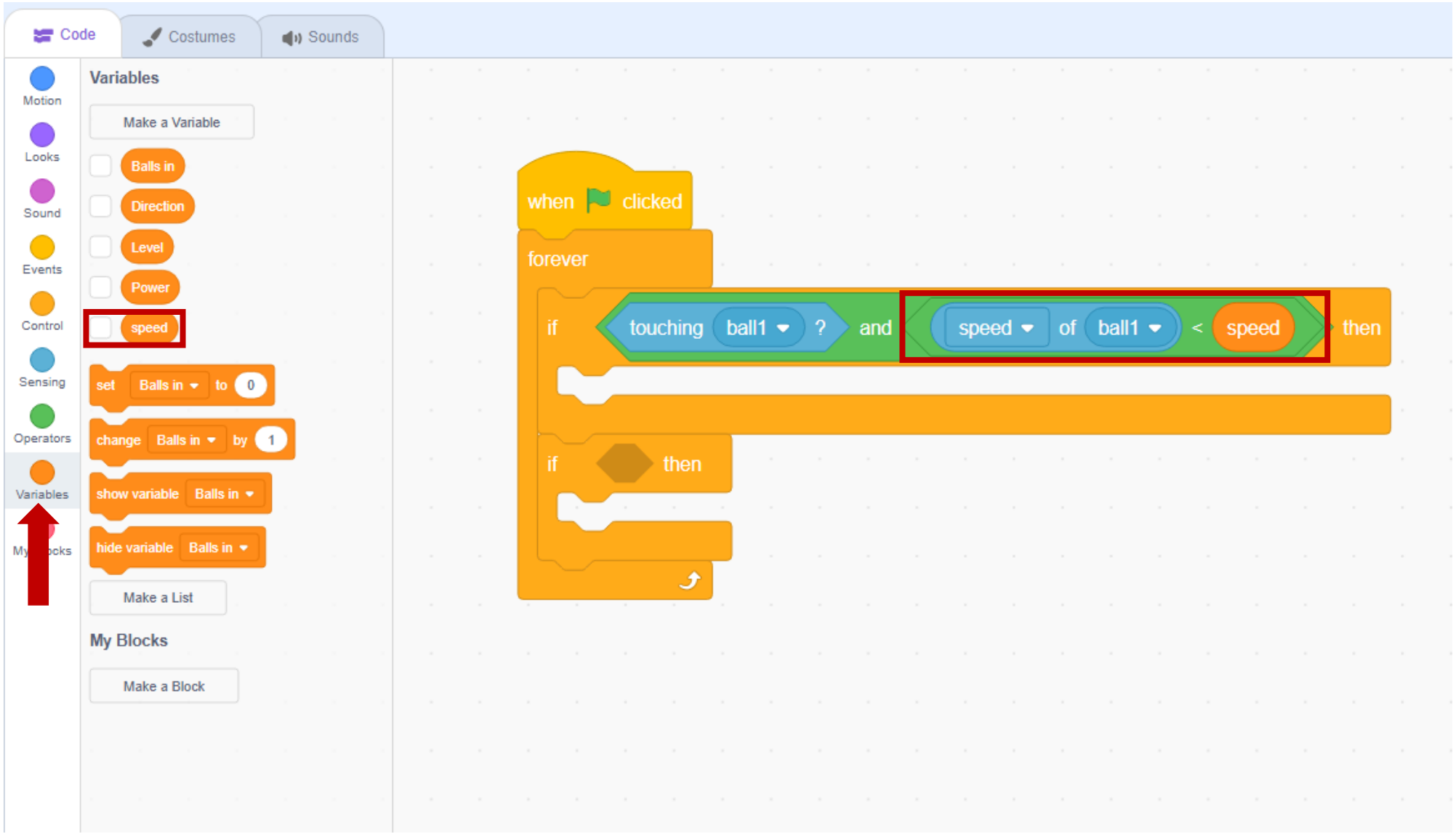


Go to “Sensing”. Grab the “touching mouse pointer?” block and insert it into the first blank of the “if-then” block. Then grab a “backdrop # of Stage” block and insert it into the “__ < 50” block. Change the mouse pointer to “ball 1” and “backdrop # of Stage” to “speed of ball 1”.

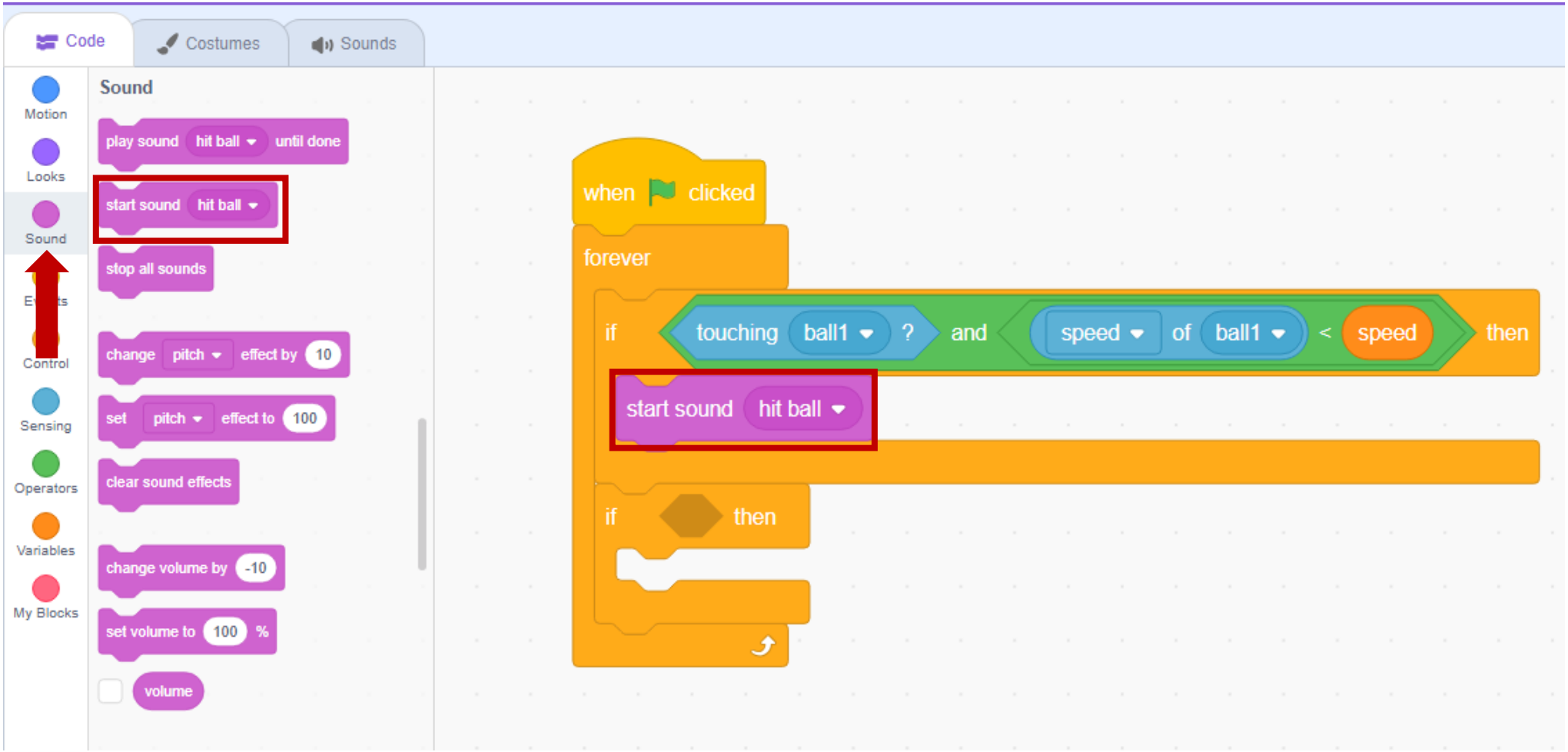



Code
Costumes
Sounds
Motion
Looks
Sound
Events
Control
Sensing
Operators
Variables
My Blocks
Events
when clicked
when space key pressed
when this sprite clicked
when backdrop switches to background1
when loudness > 10
when I receive curve whiteball
broadcast curve whiteball
broadcast curve whiteball and wait
Control
when clicked
forever
if touching ball1 ? and speed of ball1 < 50 then
if then

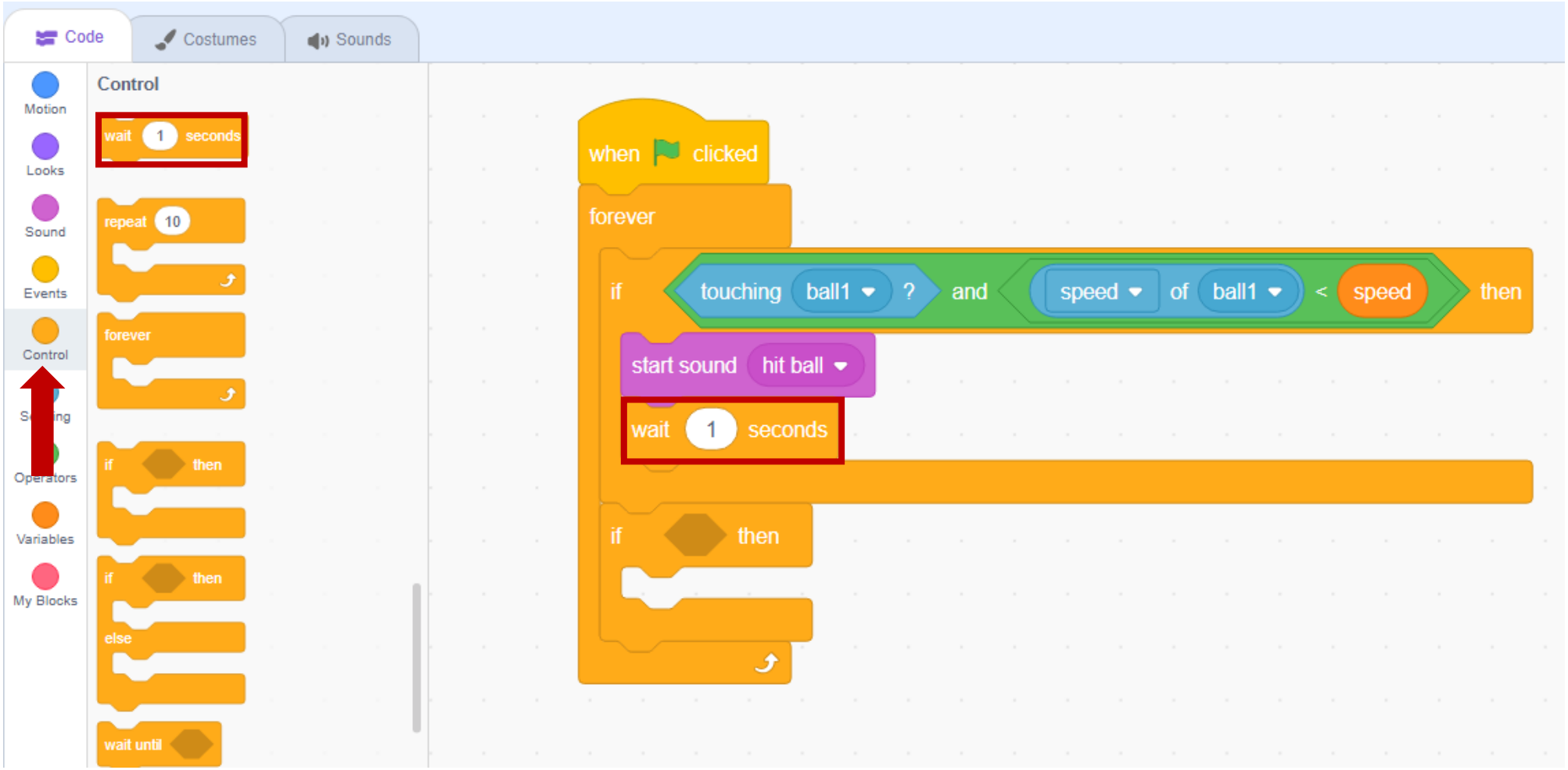
Now go to the “Variables” tab and grab the “speed” variable. Insert it into the “__ < 50” block.

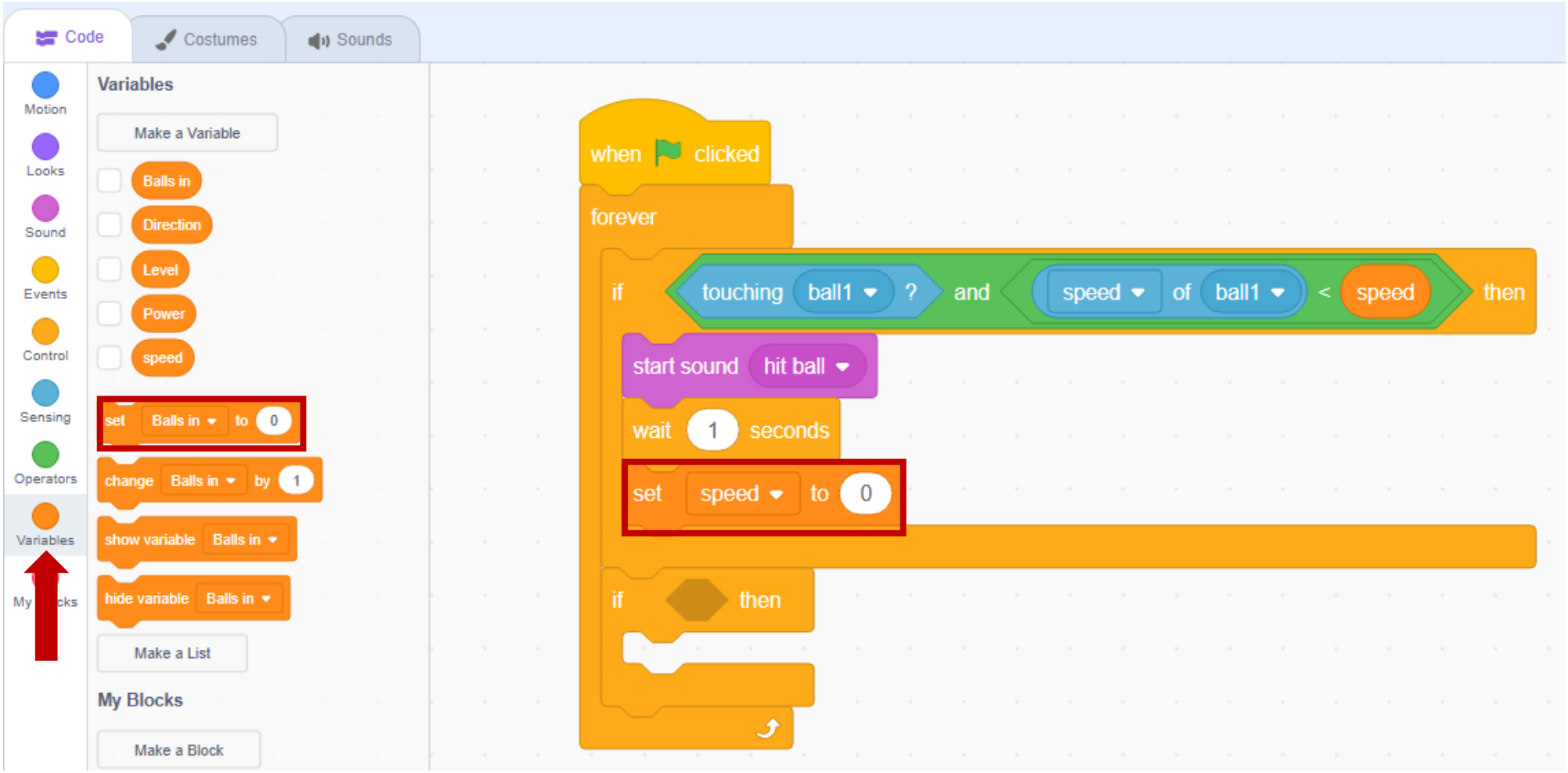


Go to “sounds” and grab the “start sound hit ball” and put it into the “if-then” statement.

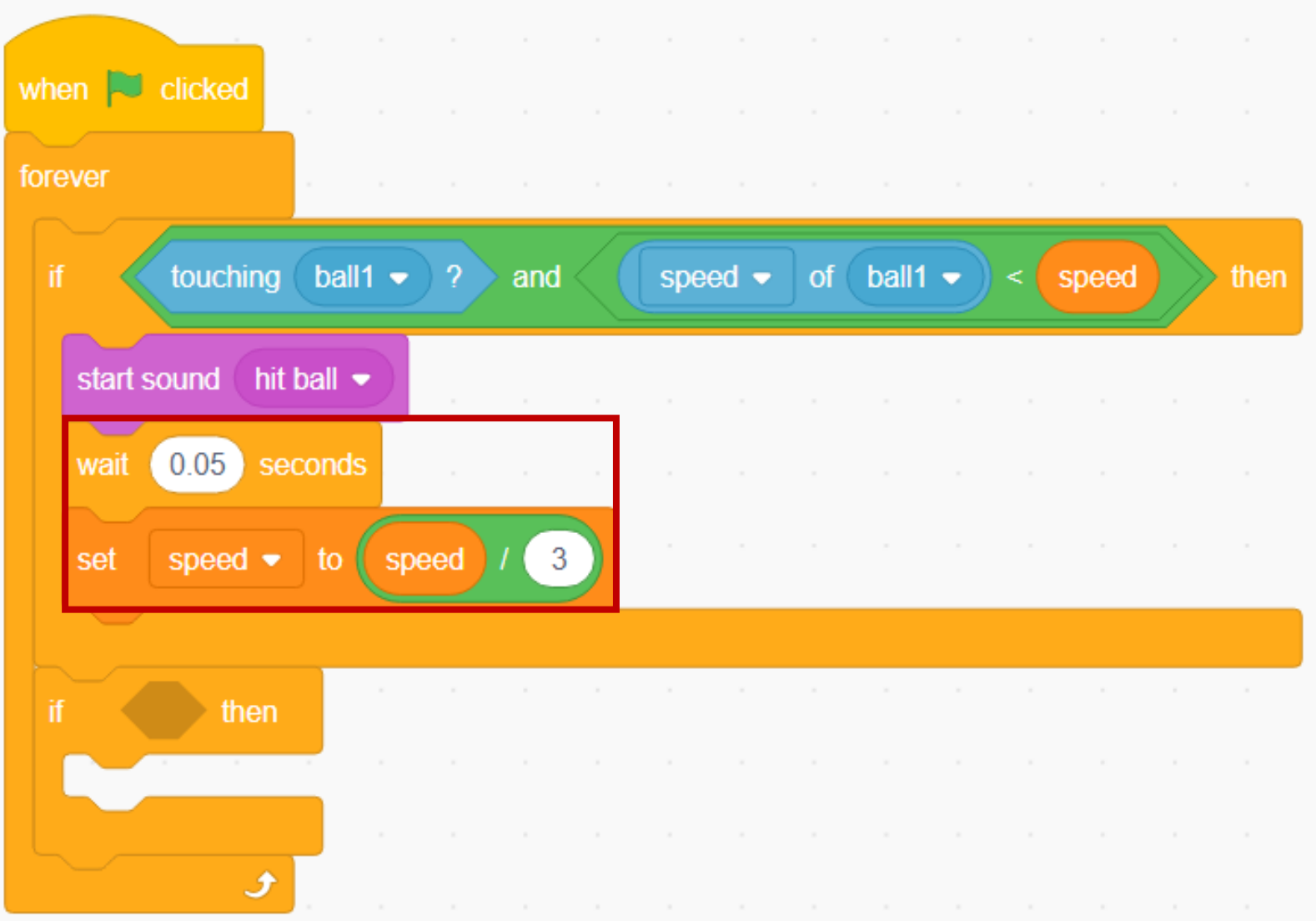


Go to “Control” and then grab the “wait 1 seconds” block and insert it into the “if-then” statement. Then go to “Variables” and grab the “set balls in to 0” block and put it into the “if-then” statement. Change the variable to speed.

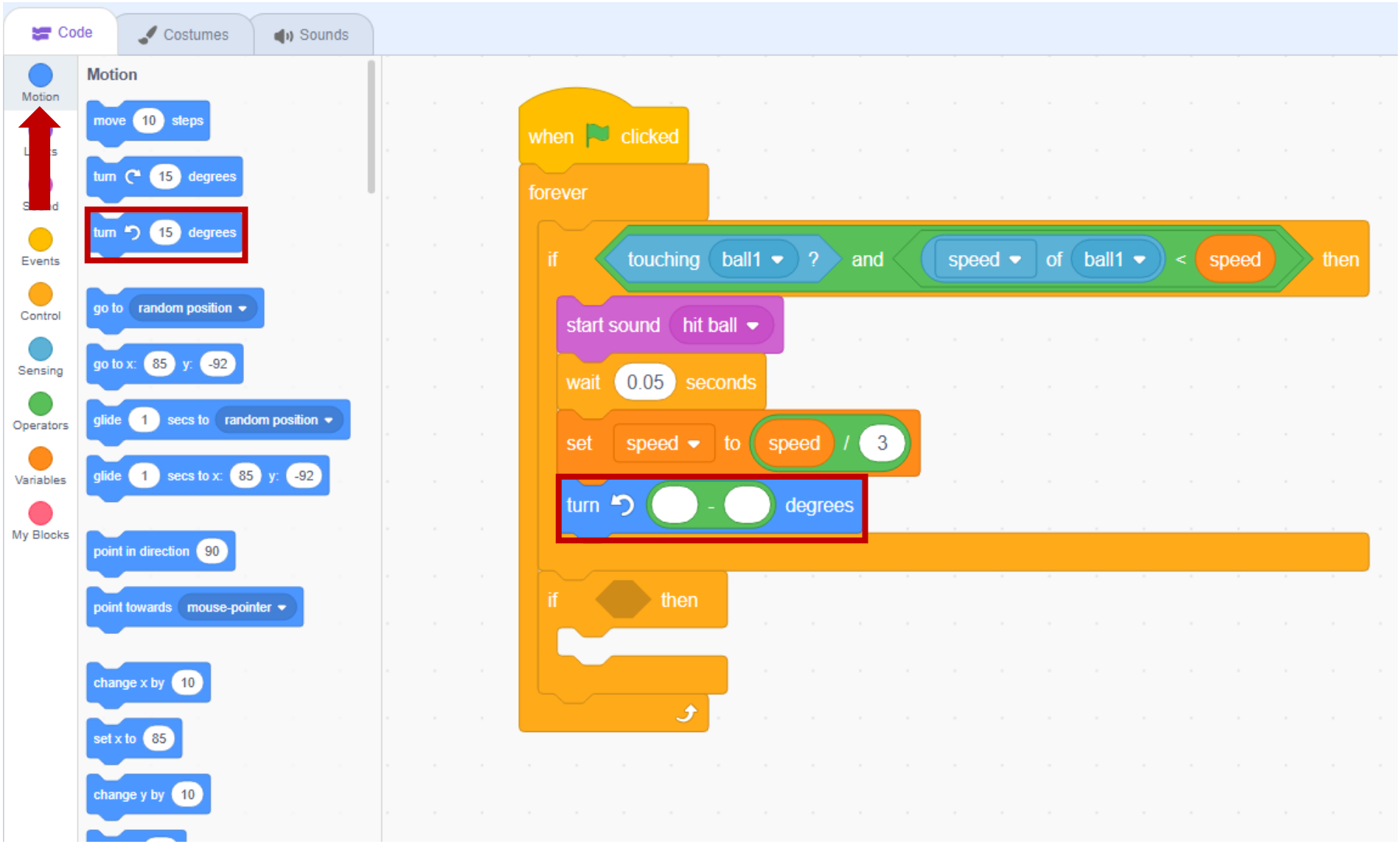



Code
Costumes
Sounds
Motion
Looks
Sound
Events
Control
Sensing
Operators
Variables
My Blocks
Variables
Make a Variable
Balls in
Direction
Level
Power
speed
set Balls in to 0
change Balls in by 1
show variable Balls in
hide variable Balls in
Make a List
My Blocks
Make a Block
when clicked
forever
if touching ball1 ? and speed of ball1 < speed then
start sound hit ball
wait 1 seconds
set speed to 0
if then

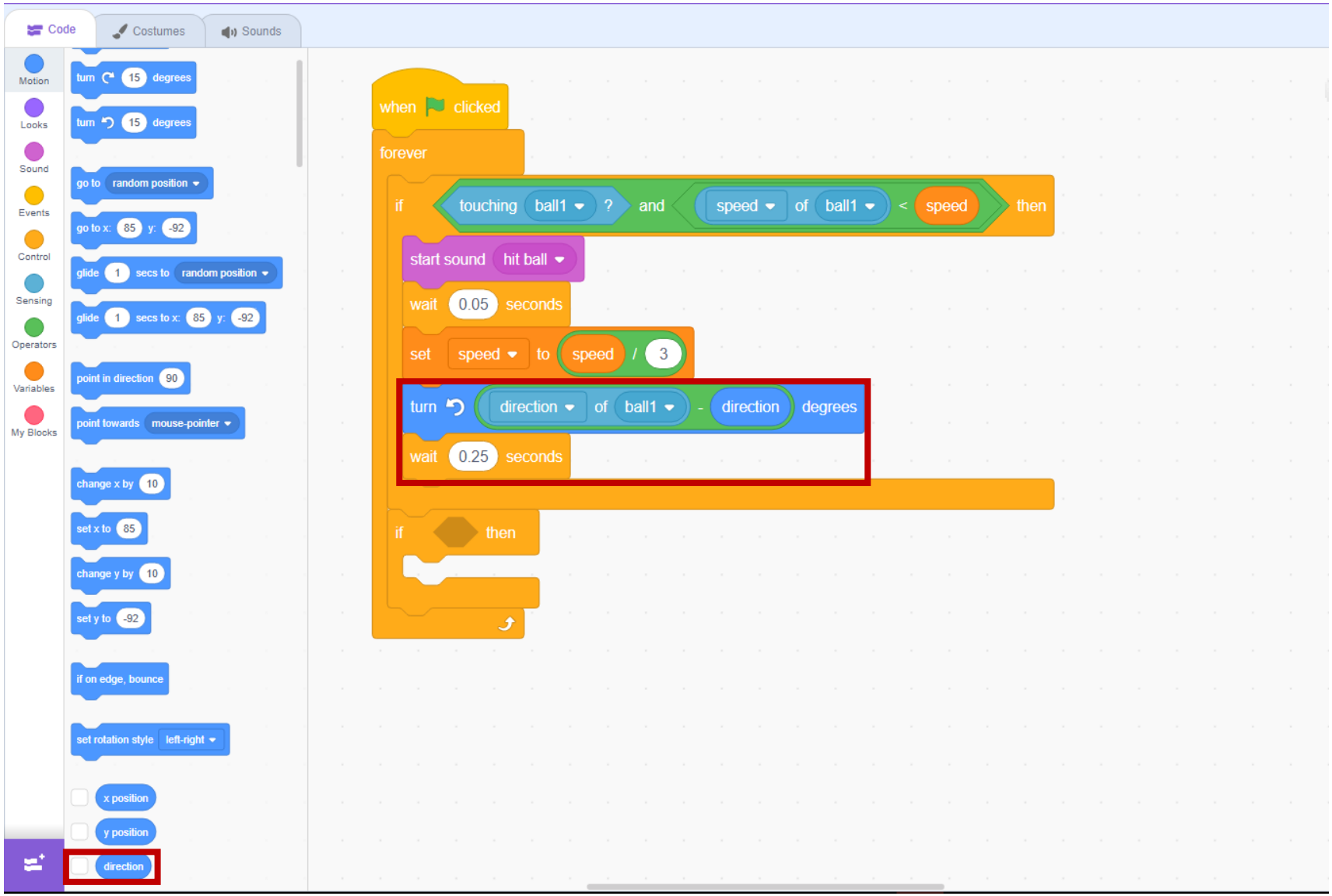
Change the wait time from 1 to 0.05 seconds. Then go to “Operators” and grab the “__ /__” block and put it into the “set speed to __” block. Then go to “Variables” to grab the speed variable and put it into the first blank of the “__ /__” block. Then type 3 for the last blank. It should look like the section shown below.



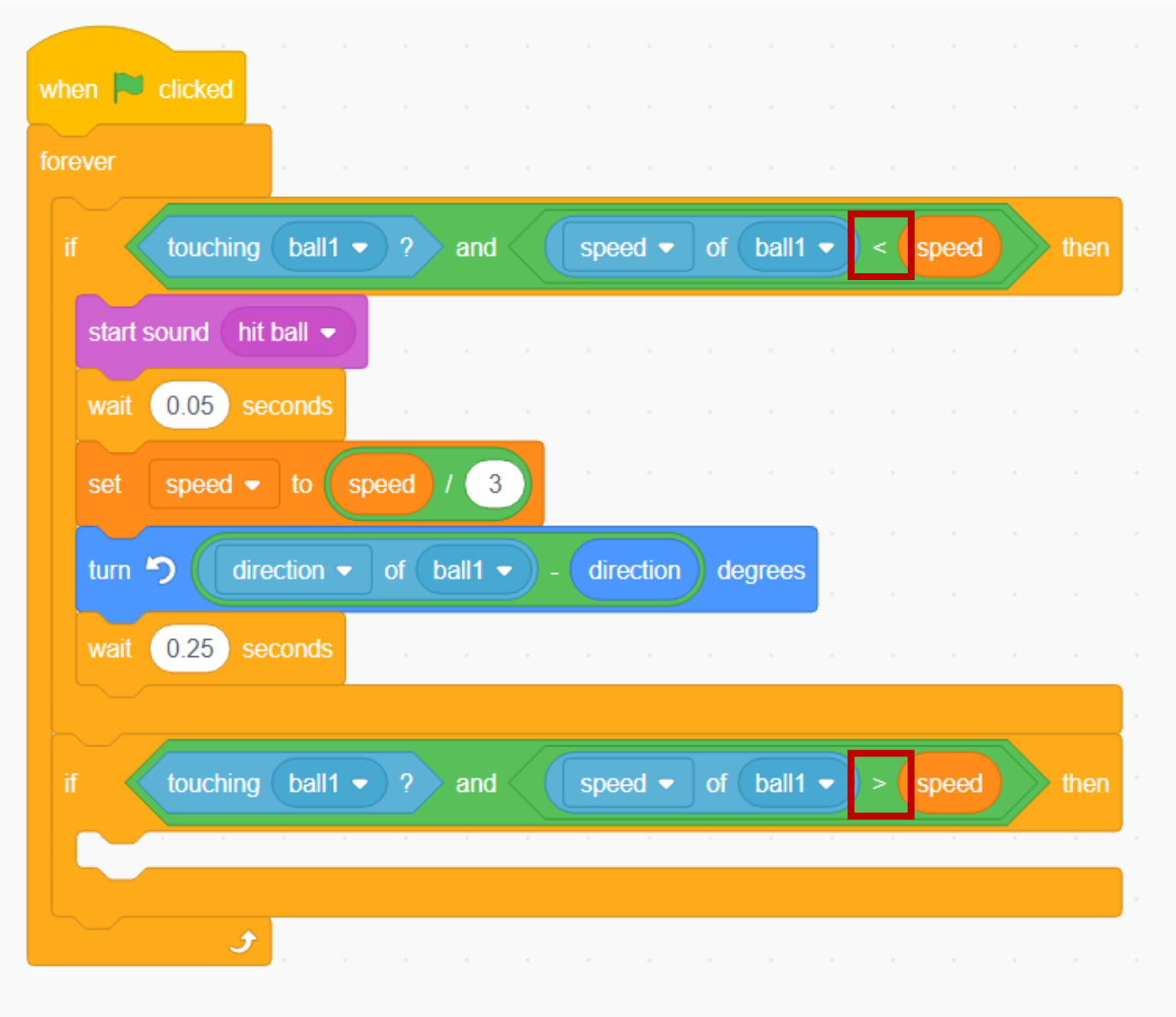
Go to “Motion” and grab the “turn counterclockwise 15 degrees” block and put it into the “if-then” statement. Then go to “Operators” and grab the “__ - __” block and put it into the “turn counterclockwise 15 degrees” block.



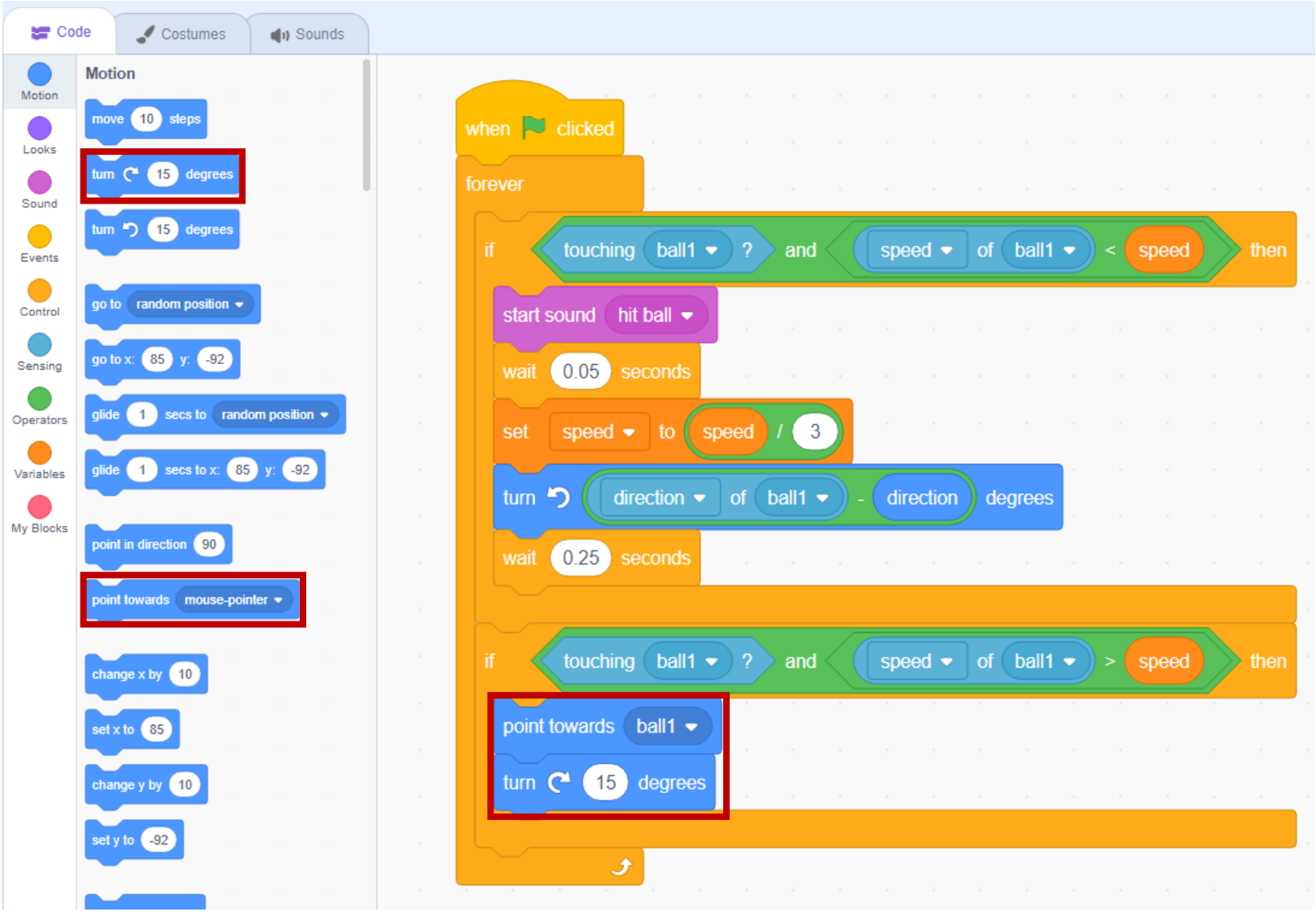
Go to “Sensing” and grab the “backdrop # of Stage” and add it to the first blank. Change variables so it says, “direction of ball 1”. Then go to “Motion” and grab the “direction” block and attach it to the second blank. Then go to control add grab the “wait 1 seconds” block and change it to 0.25.



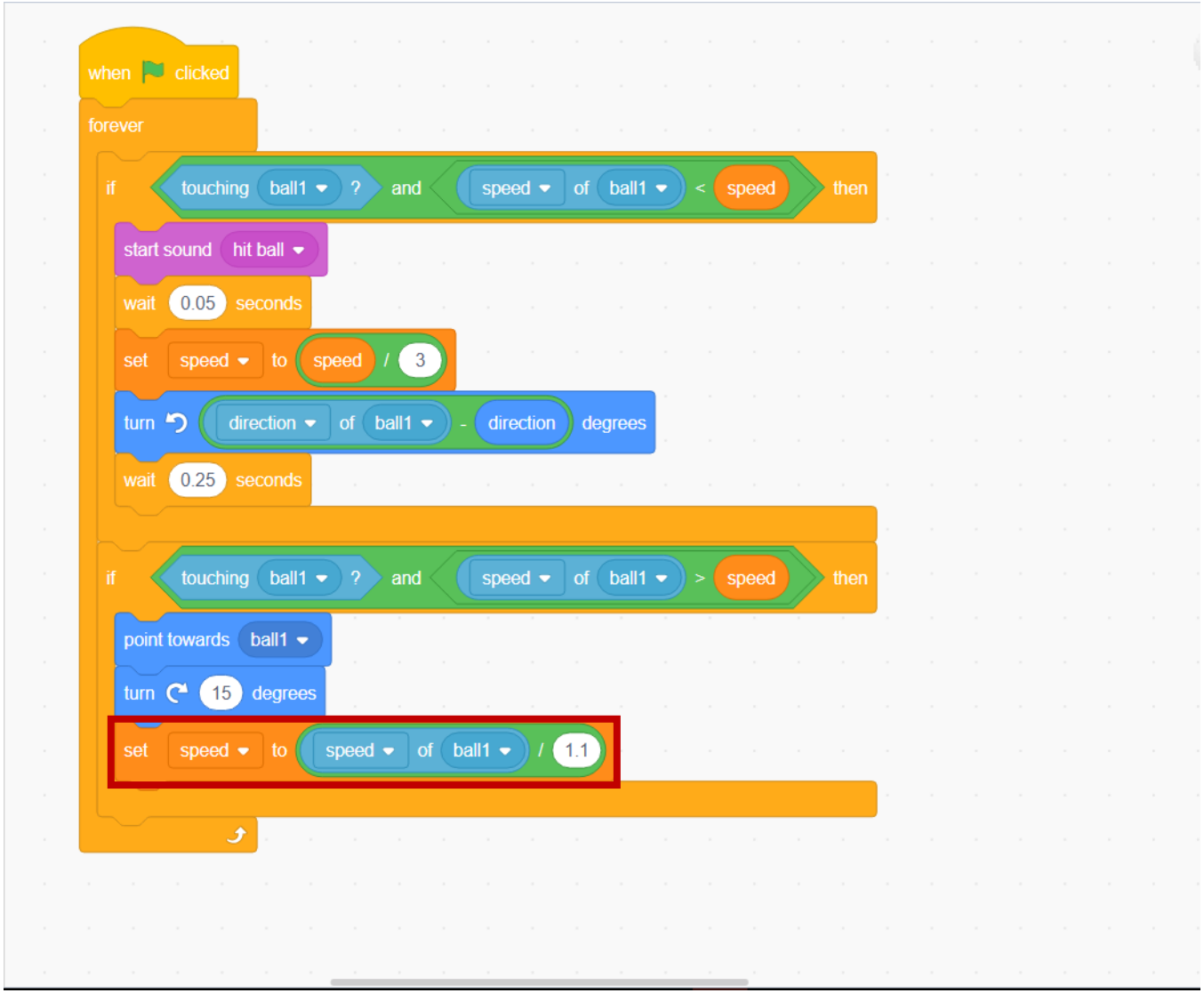
The second “if-then” block is very similar to the first. Insert the same blocks in the “if-then” blank, but grab “__>__” instead of the “__<__”.



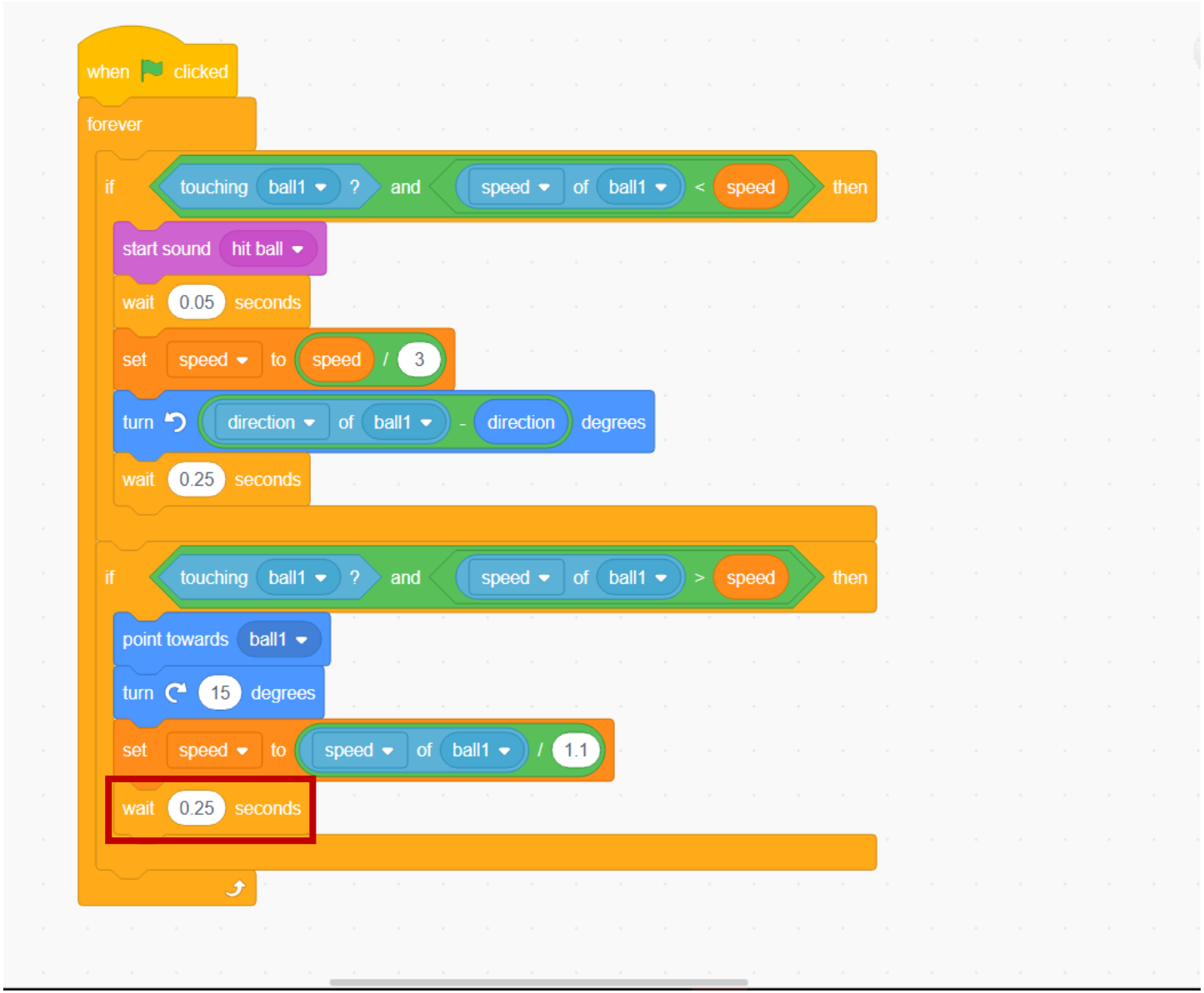
Go to the “Motion” tab and grab the “point towards mouse-pointer” block and change it “point towards ball 1”. Then add a “turn clockwise 15 degrees” block. Keep the same degree.



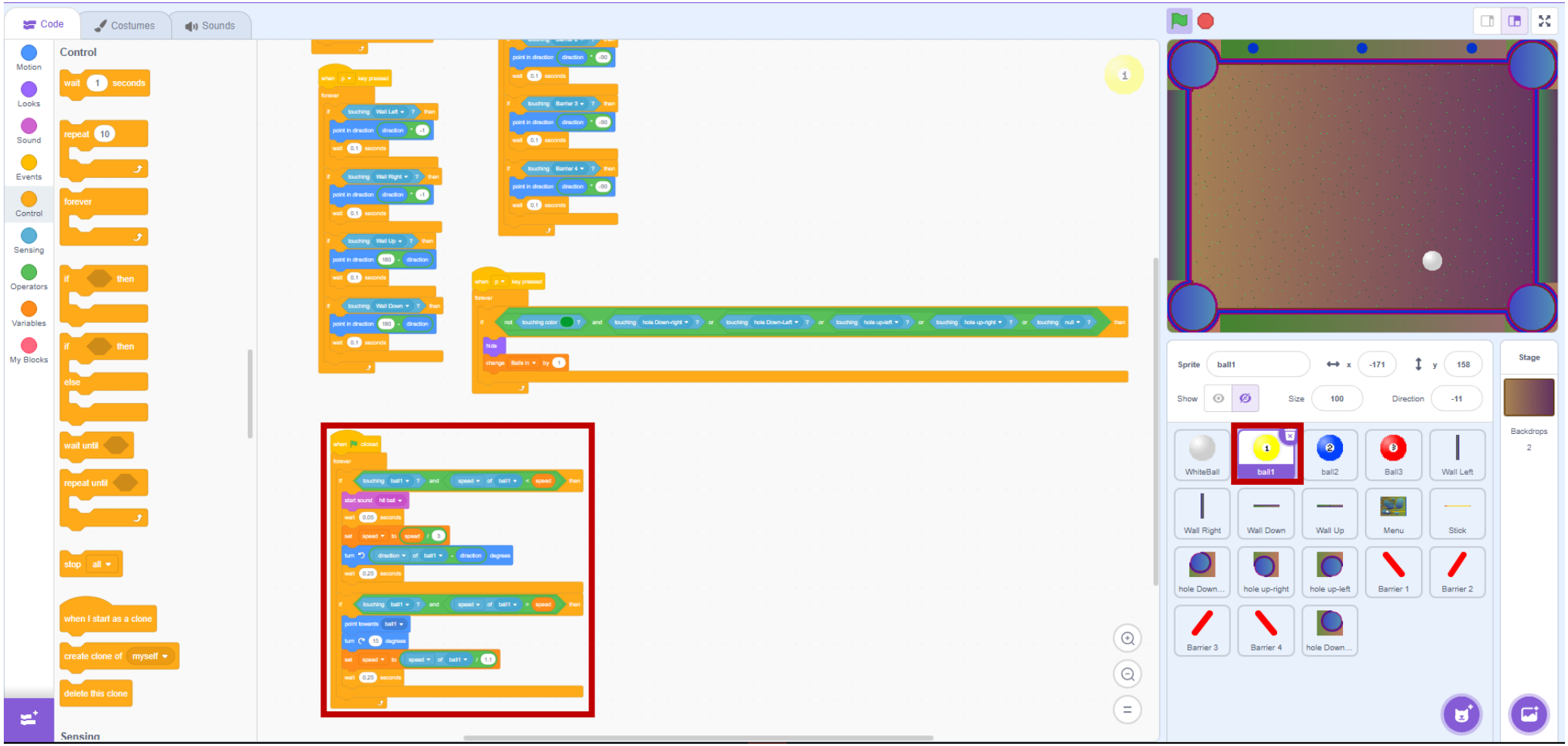
Go to the “Variables” tab and grab the “set balls in to 0” block and change the variable to “speed”. Then go to “Operators” and grab the “__/__”. Then go to “Sensing” and grab the “backdrop # of Stage” and insert it into the first blank. Change it to “speed of ball 1”. Then type 1.1 in the second blank.



Go to the “Control” tab and grab the “wait 1 second” block. Change the block so it will wait 0.25 seconds.

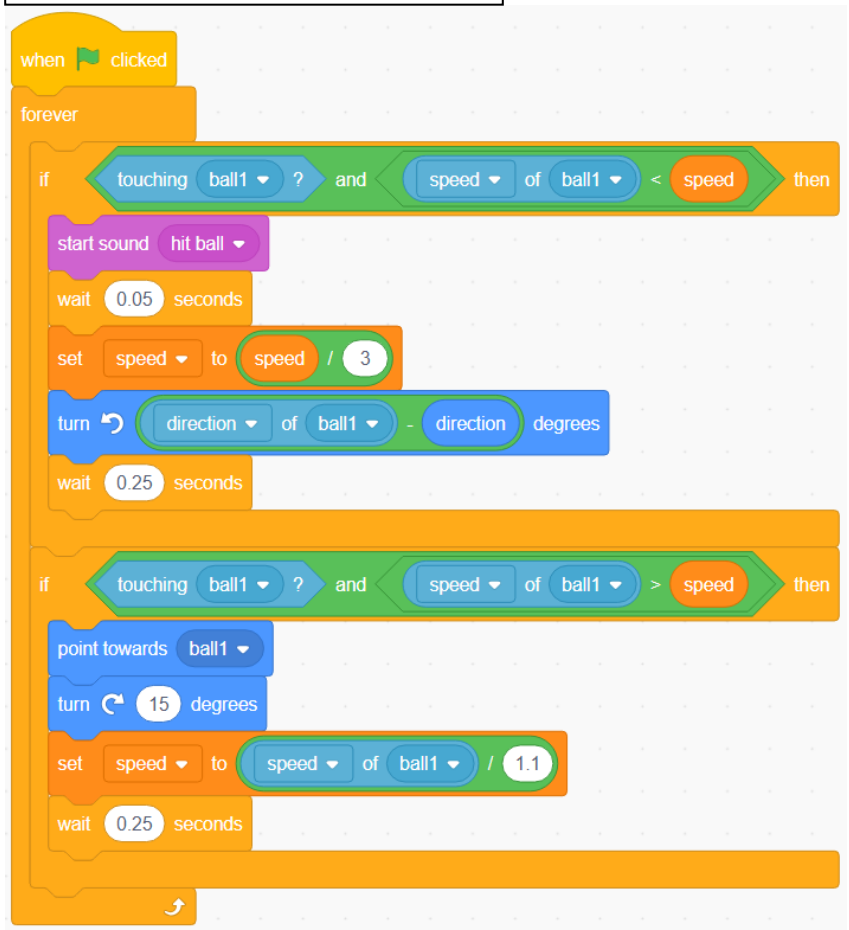


Click on the “when flag clicked” block in the code and then use ctrl+c to copy the code block. Now select the “ball 1” sprite. Use ctrl+v to paste the code onto the canvas. You may need to move around the canvas to find the code block.

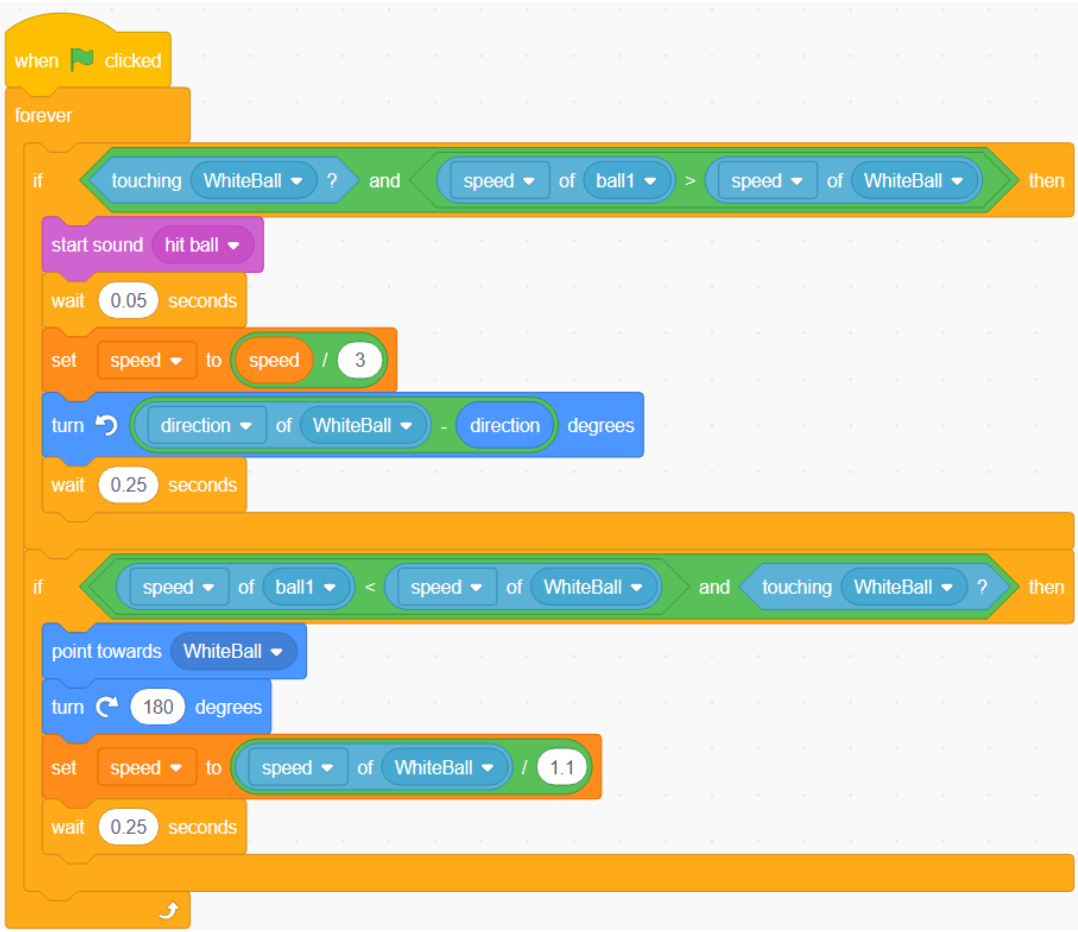


Now we have to change all instances of “ball 1” to “white ball”. Make sure that the block is still checking for speed not direction. We also have to change the “turn clockwise 15 degrees” block to “turn clockwise 180 degrees”. Use the two pictures below to compare the different code blocks.

Code block in “white ball” sprite

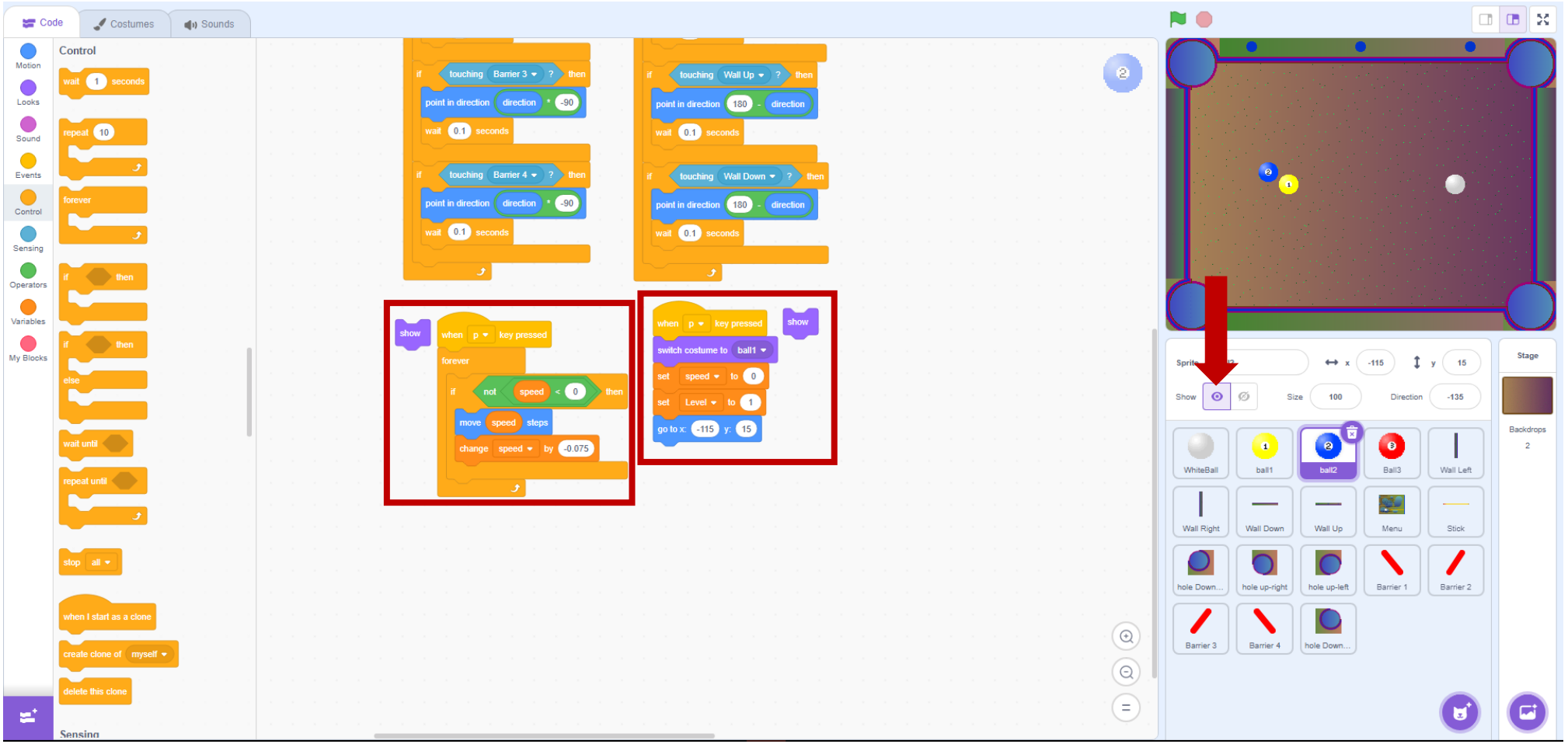


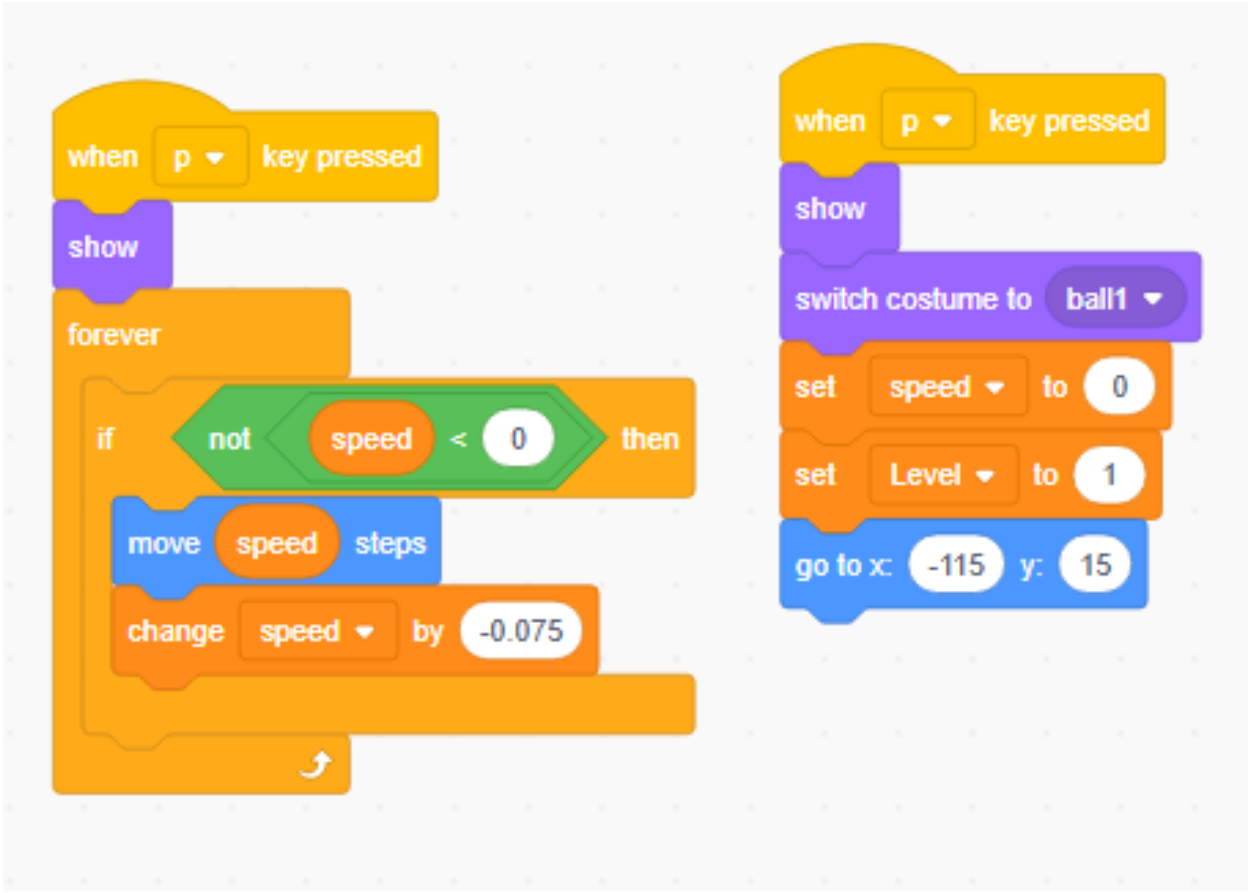
Code block in “ball 1” sprite



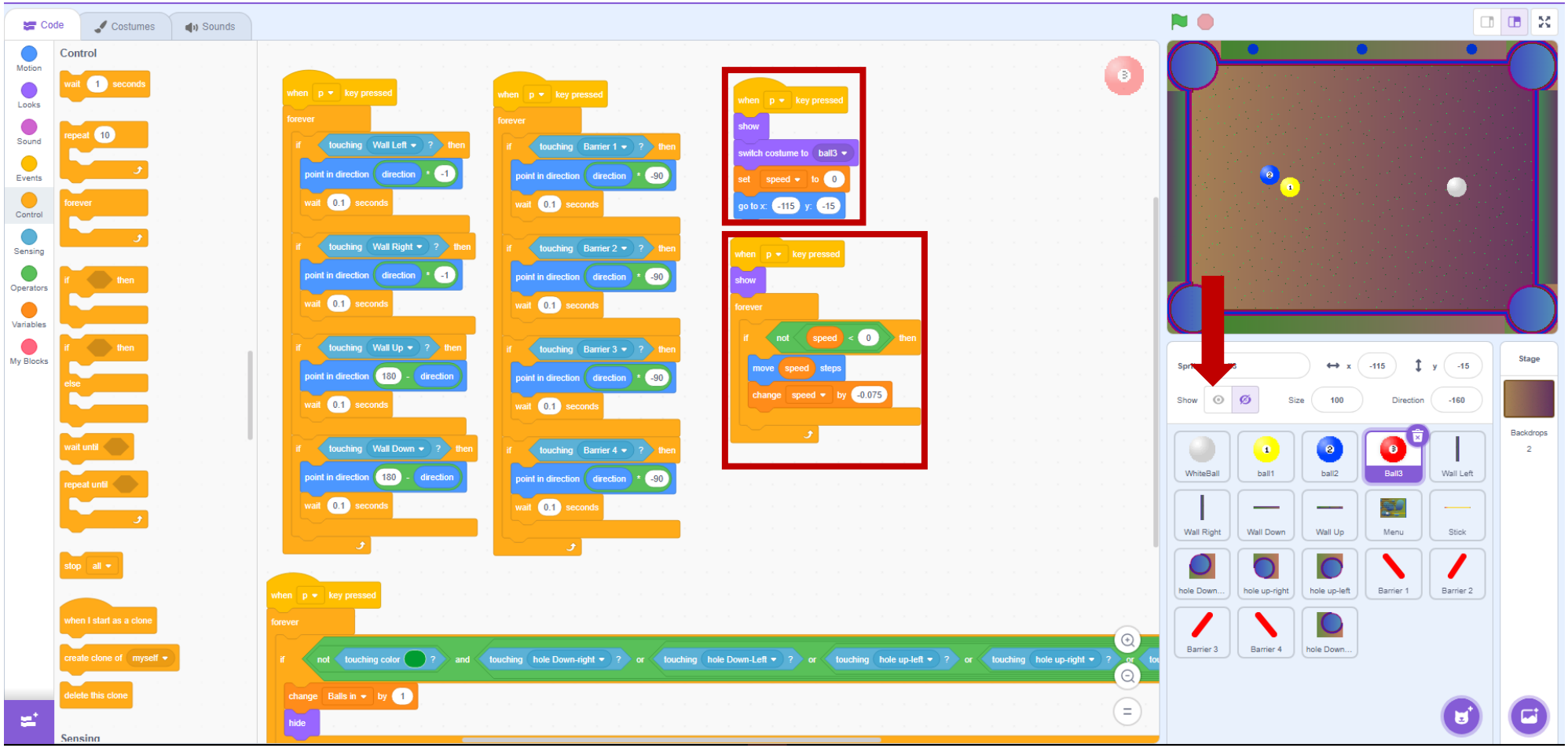
<u>This section will cover level 2 of the game</u>

First go to the “ball 2” sprite and click on the eyeball to make the ball visible. Then attach the two “show” block to the adjacent code blocks they are next to.

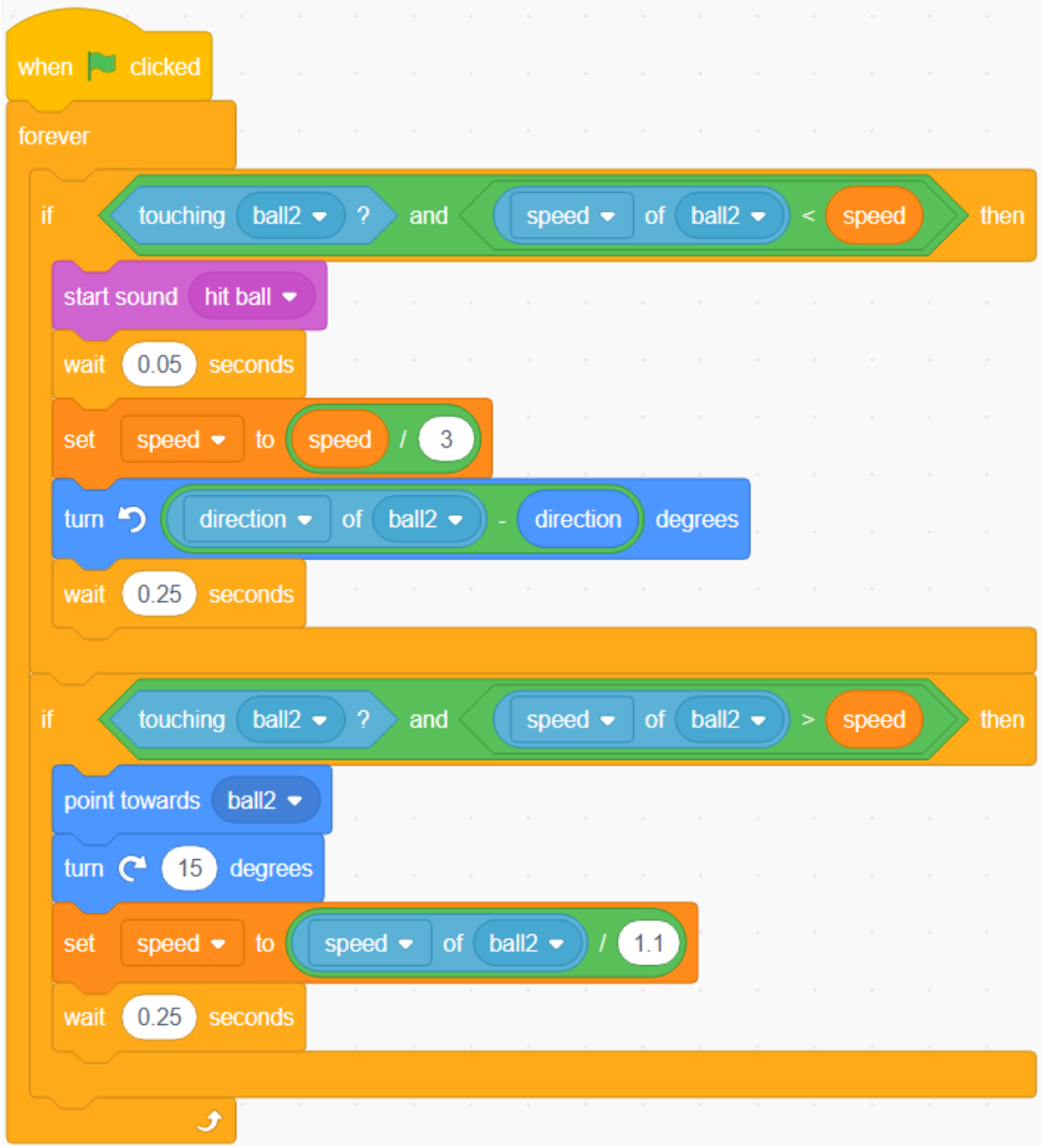



when p key pressed
show
forever
if not speed < 0 then
move speed steps
change speed by -0.075
when p key pressed
show
switch costume to ball1
set speed to 0
set Level to 1
go to x: -115 y: 15

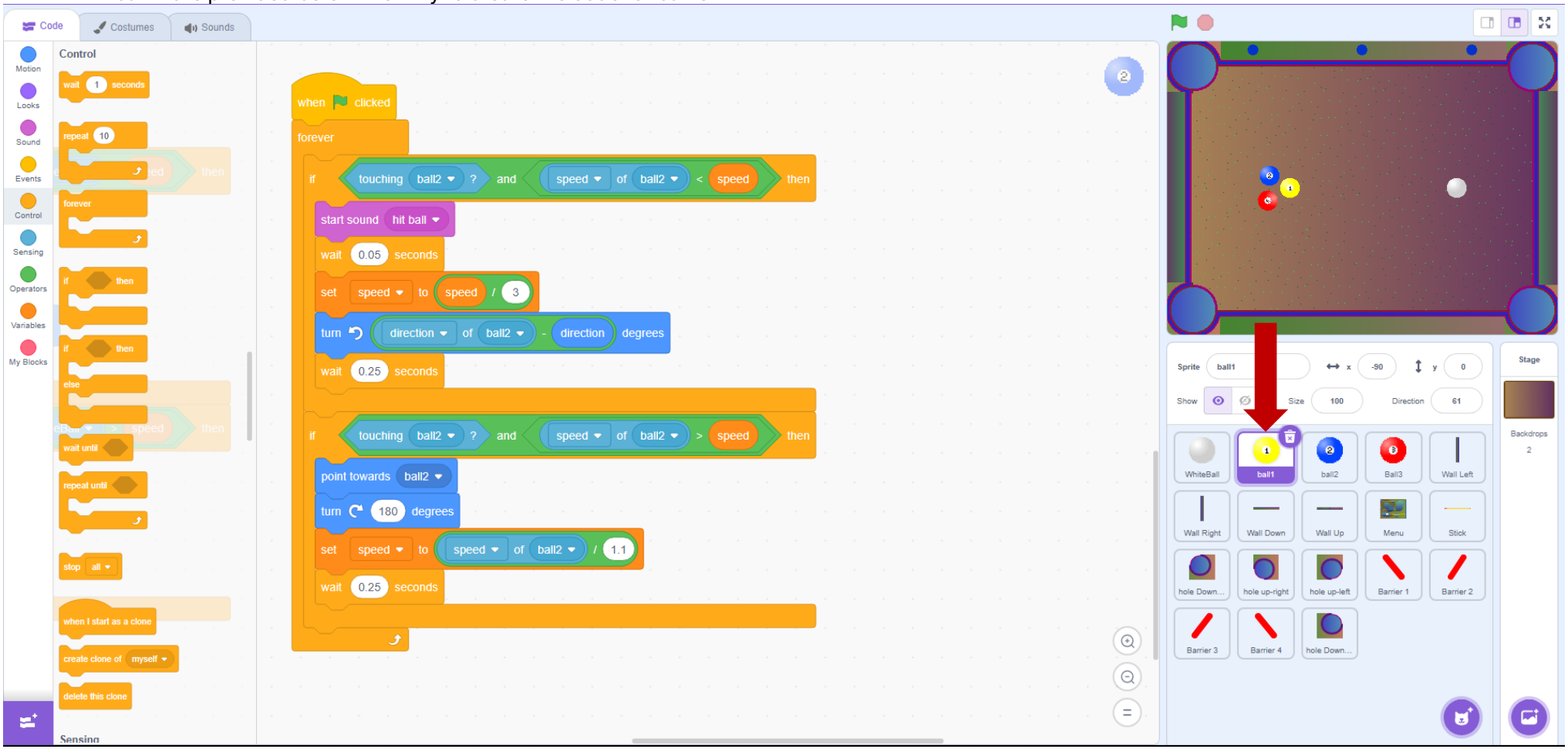
Repeat this process for ball 3.

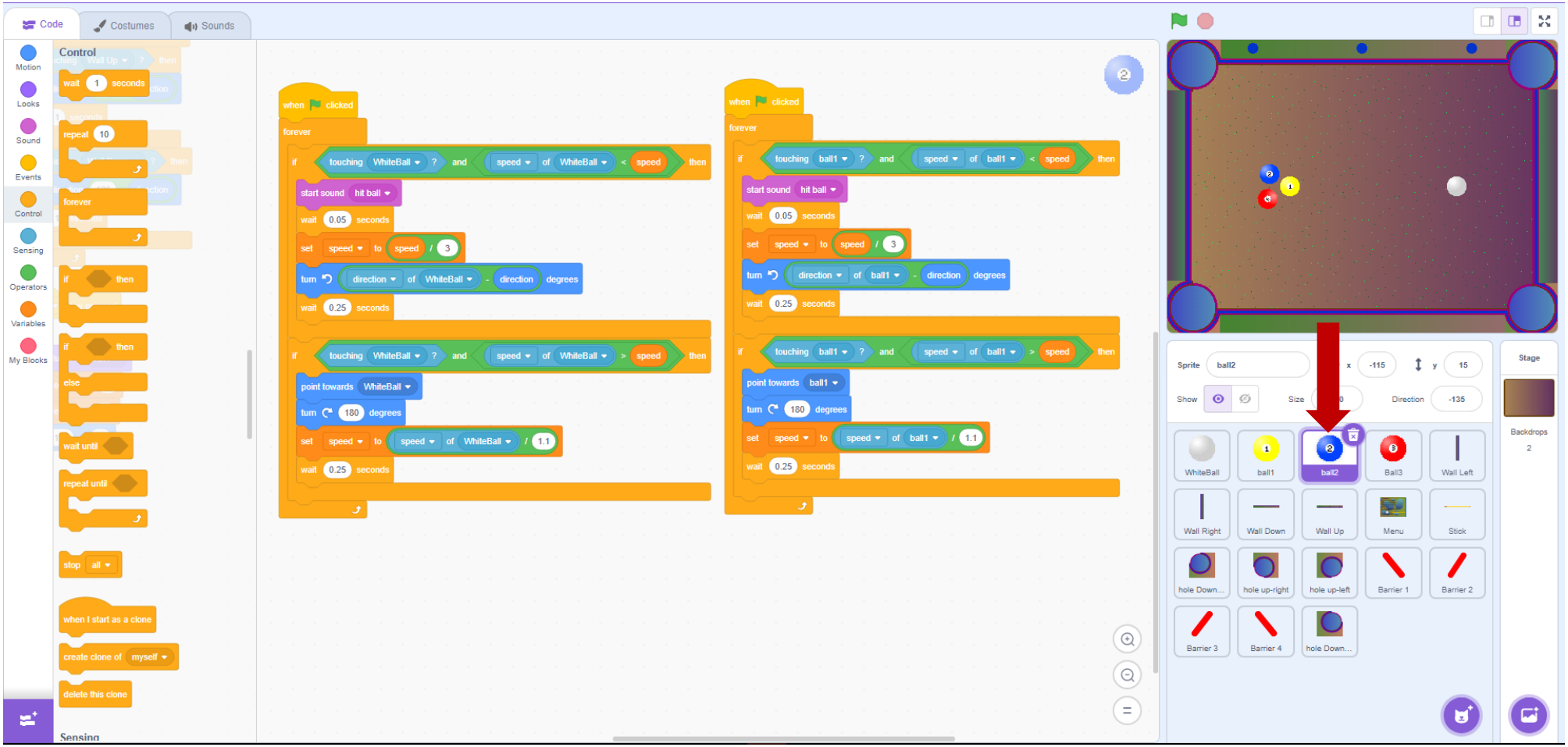


Select the “white ball” sprite and create the same code block as the one in level 1. Change all instance of “ball 1” to “ball 2”.



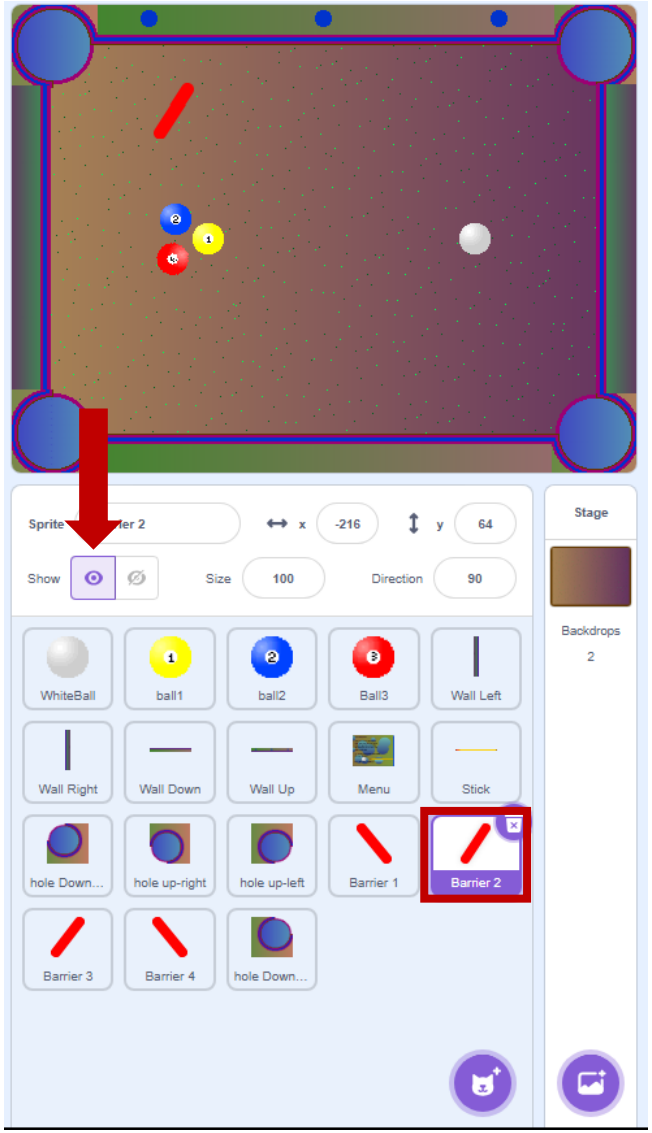
Now repeat the same process in the ball 1 sprite and the ball 2 sprite. The correct code for the interactions for the white ball, ball 1, and ball 2 are provided below. Now try to create the code for ball 3.



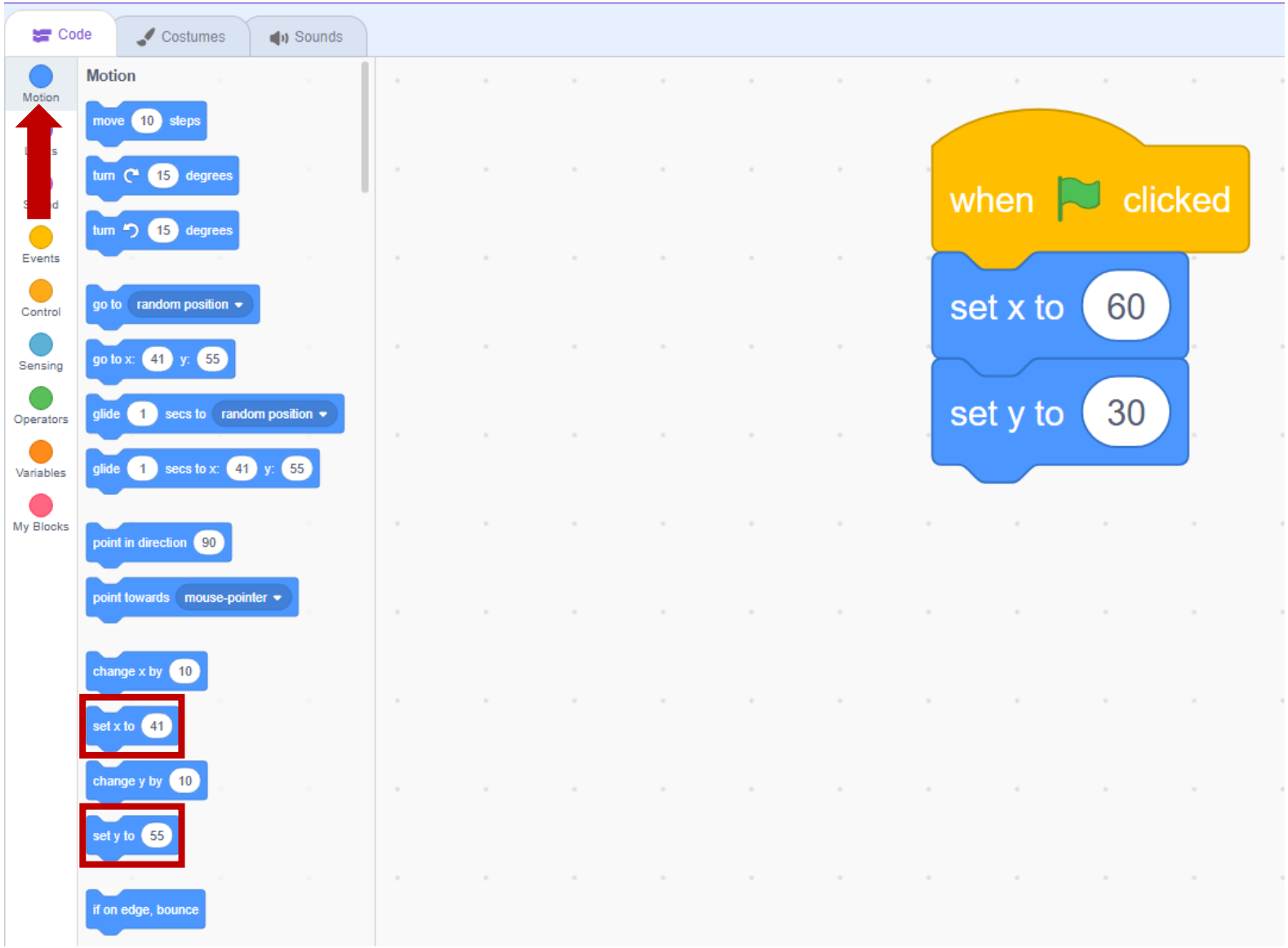

Code
Costumes
Sounds
Motion
Looks
Sound
Events
Control
Sensing
Operators
Variables
My Blocks
Control
wait 1 seconds
repeat 10
forever
if then
if then
else
wait until
repeat until
stop all
when I start as a clone
create clone of myself
delete this clone
Sensing
when clicked
forever
if touching WhiteBall ? and speed of WhiteBall < speed then
start sound hit ball
wait 0.05 seconds
set speed to speed / 3
turn direction of WhiteBall - direction degrees
wait 0.25 seconds
if touching WhiteBall ? and speed of WhiteBall > speed then
point towards WhiteBall
turn 180 degrees
set speed to speed of WhiteBall / 1.1
wait 0.25 seconds
when clicked
forever
if touching ball1 ? and speed of ball1 < speed then
start sound hit ball
wait 0.05 seconds
set speed to speed / 3
turn direction of ball1 - direction degrees
wait 0.25 seconds
if touching ball1 ? and speed of ball1 > speed then
point towards ball1
turn 180 degrees
set speed to speed of ball1 / 1.1
wait 0.25 seconds
Sprite ball2
x -115
y 15
Show
Size
Direction -135
Stage
Backdrops 2
WhiteBall
ball1
ball2
Ball3
Wall Left
Wall Right
Wall Down
Wall Up
Menu
Stick
hole Down...
hole up-right
hole up-left
Barrier 1
Barrier 2
Barrier 3
Barrier 4
hole Down...

This section will cover level 3 of the game

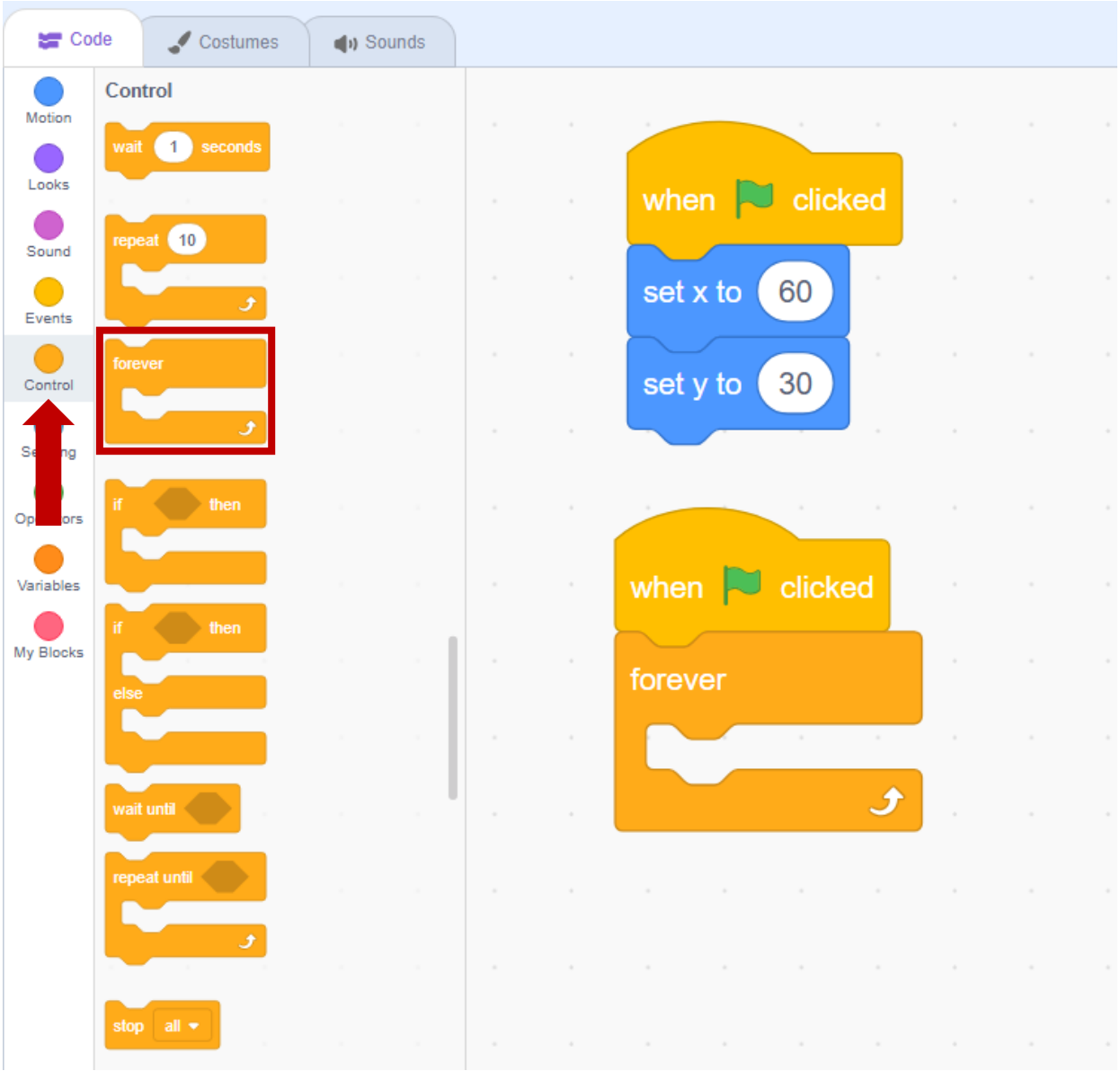
Go to each of the barriers and click on the eyeball to make them visible.



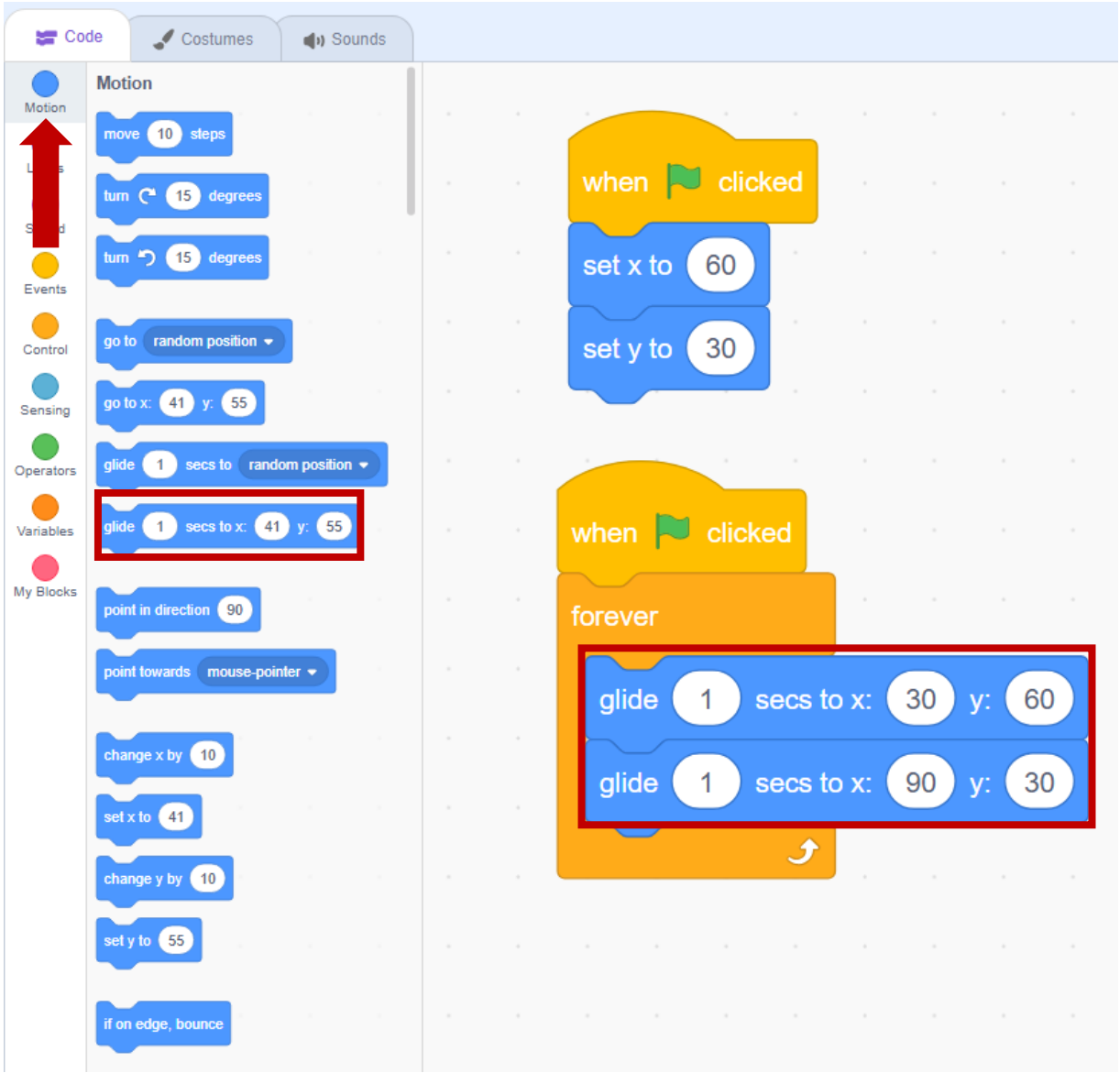
Go to the “Events” tab and select the “when flag pressed” block. Then go to the “Motion” tab and grab a “set x to __” and a “set y to __” block. Change the x to 60 and the y to 30.



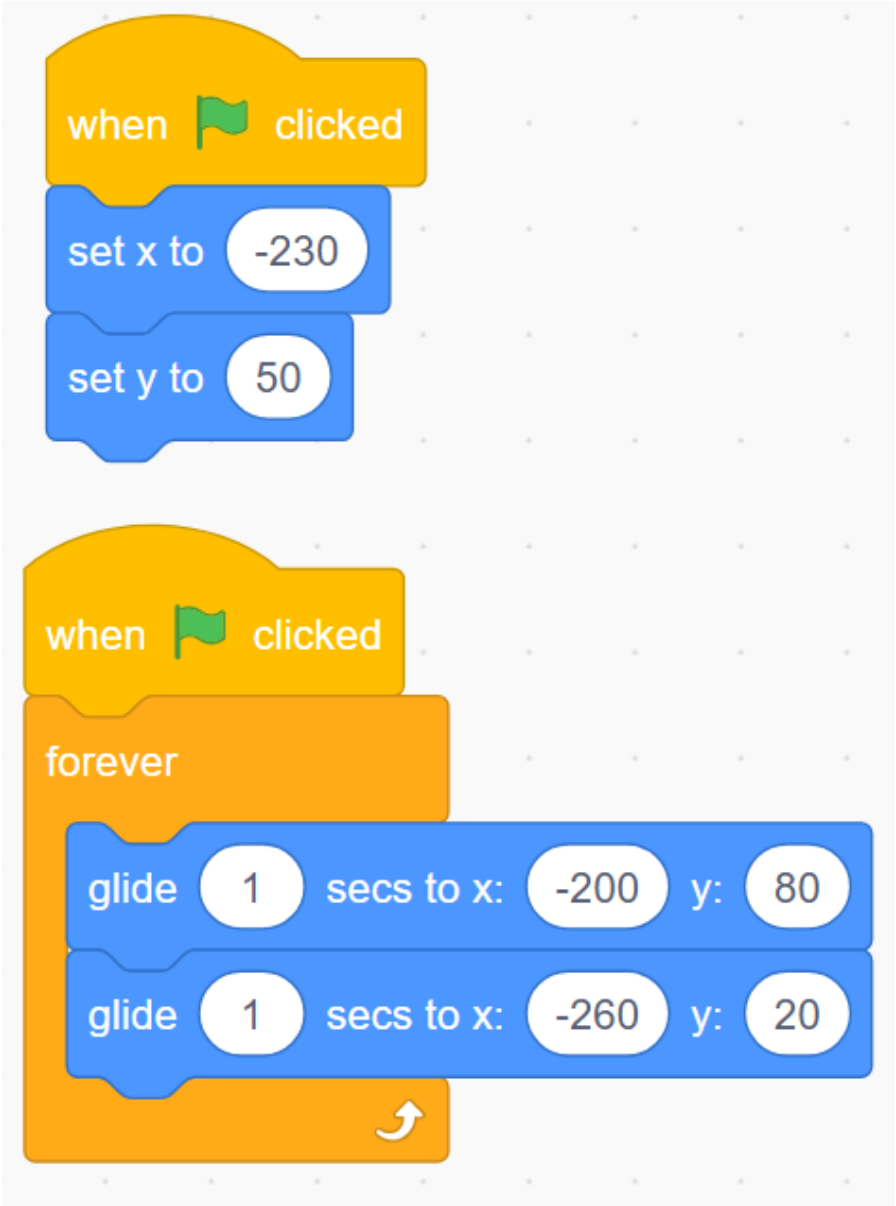
Go back to the “Events” tab and grab the “when flag pressed” block. Then go to the “Control” tab and grab a forever loop.



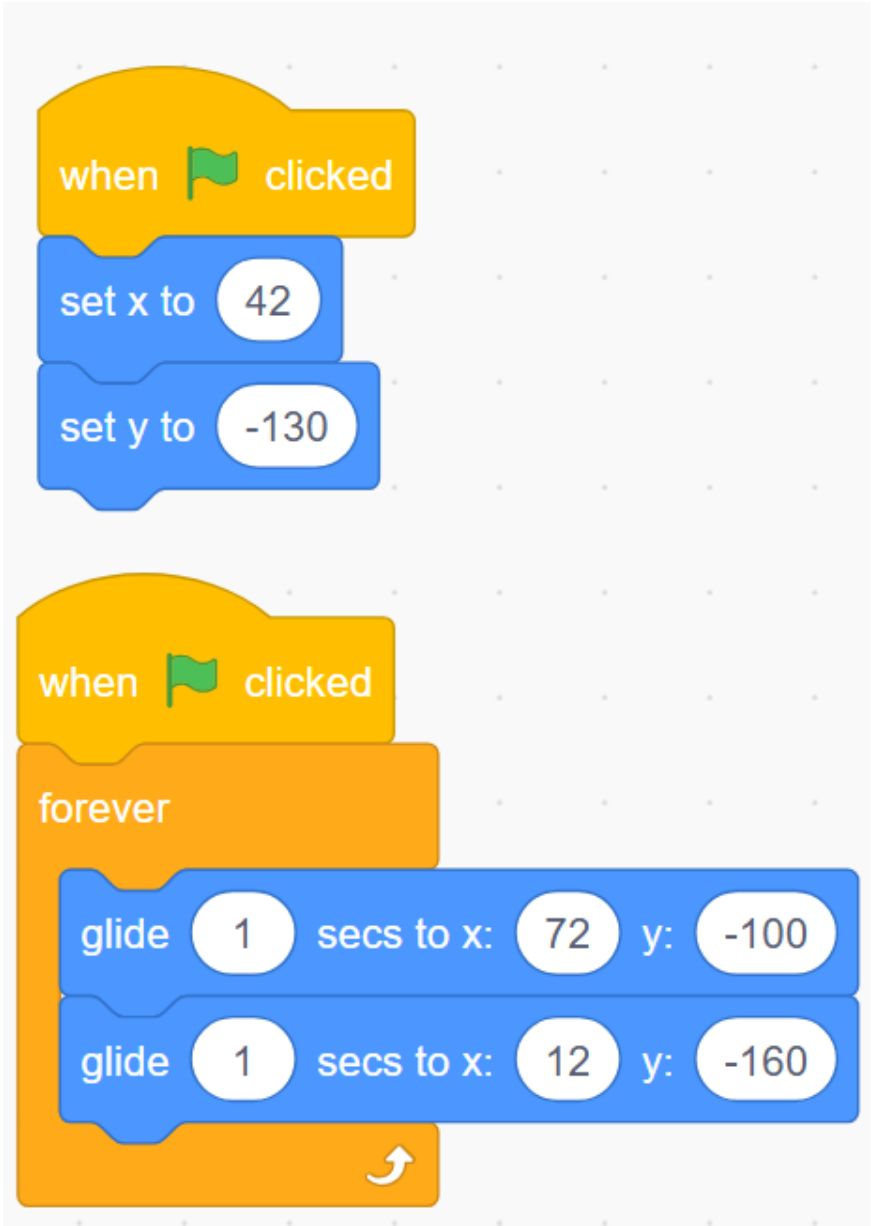
Go to the “Motion” tab and grab two “glide __ secs to x:__ y:__” and insert them both inside the forever loop. Set the glide to 1 sec for both. Set the x to 30 and y to 60 for one of the glide blocks. Then set the x to 90 and y to 30 for the other.



This is a similar process for the remaining barriers. Below is the code for the barrier 2.



Below is the code for barrier 3.



Below is the code for barrier 4.