Scratch Programming

Lesson 2-12

Shooting Game IV

Presented by Advaspire Team

Review - Switch Weapon Key (q key)

So we will make the functions for different key press in switching and reloading weapon:

<q> key → switch to next weapon
<r> key → reload ammo
<1> key → switch to slot 1
<2> key → switch to slot 2
<3> key → switch to slot 3
<4> key → switch to slot 4

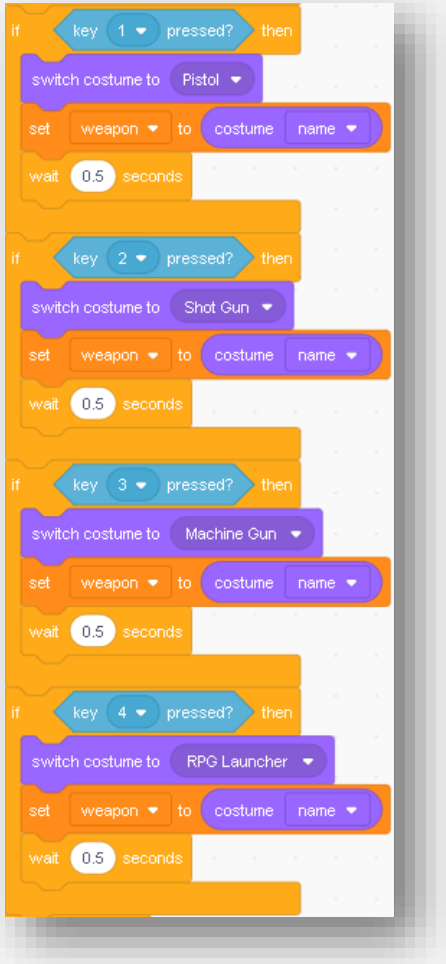
Review - Setting up variables

So we will have a variable called "weapon" to record which weapon we are using now.

And player can't fire when he's reloading the ammo.

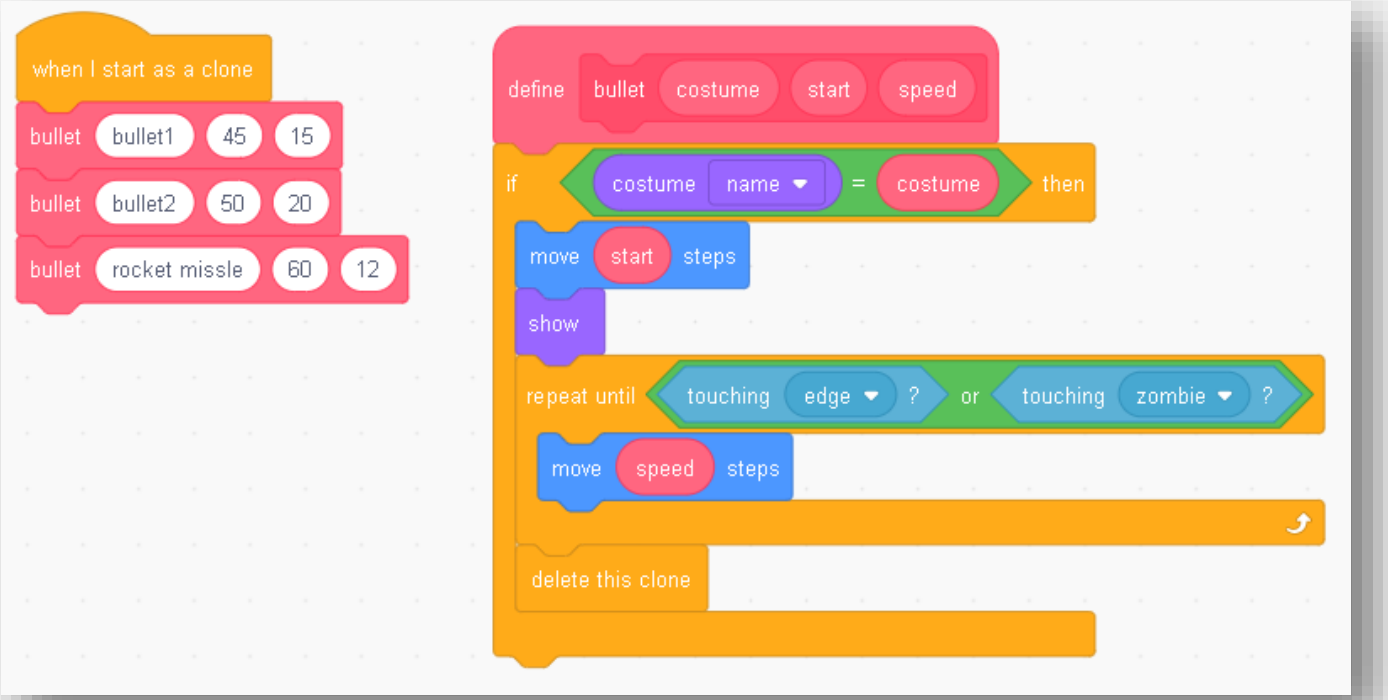
So I will set a "reloading?" as a state to check is the player is reloading or not reloading.

Review - Switching between Slots



And for <1> <2> <3> <4> slots switching keys, we will switch our weapon according to the slots.

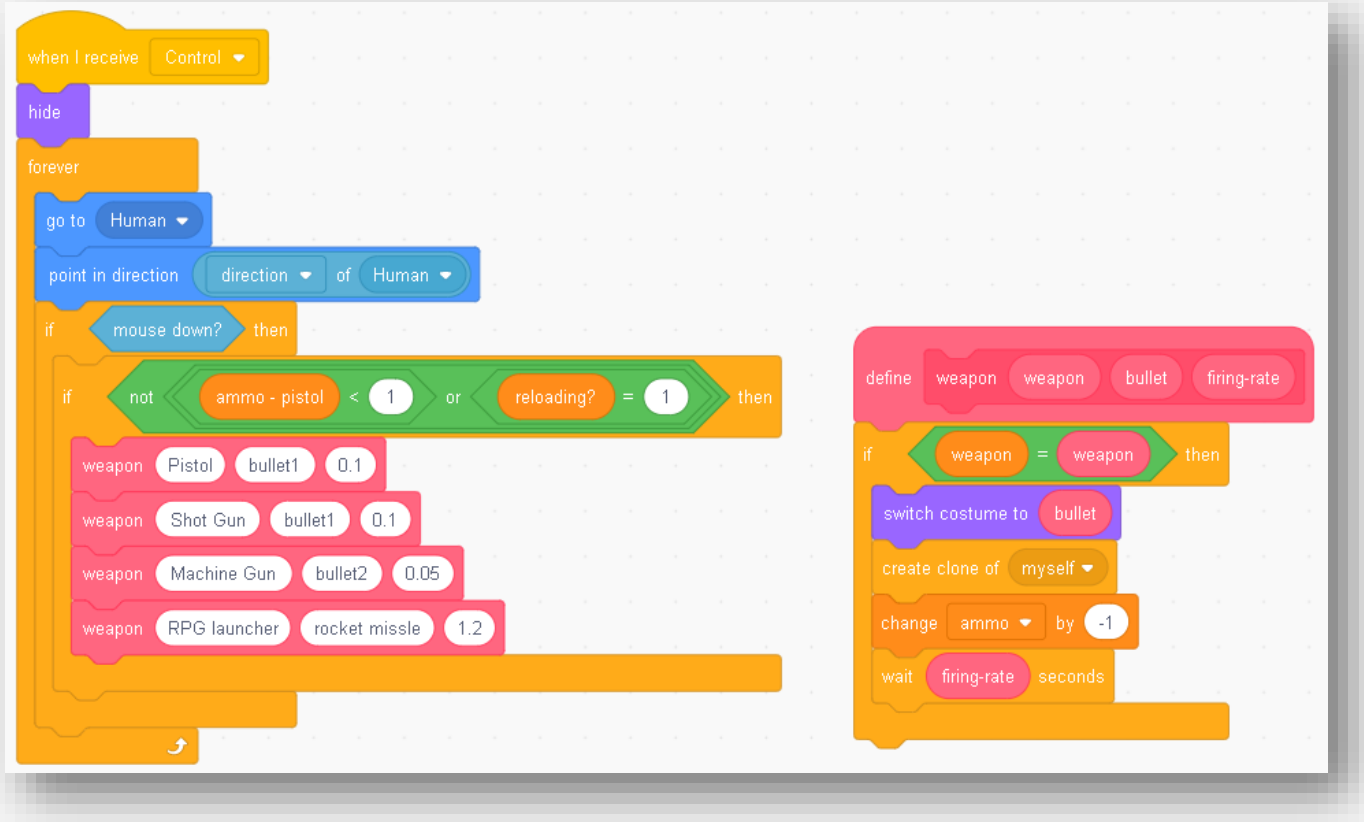
Review - Firing bullets



As we know the way our bullet fly forward is similar, we can define our own my block and link "costume", "start", and "speed" to the input.

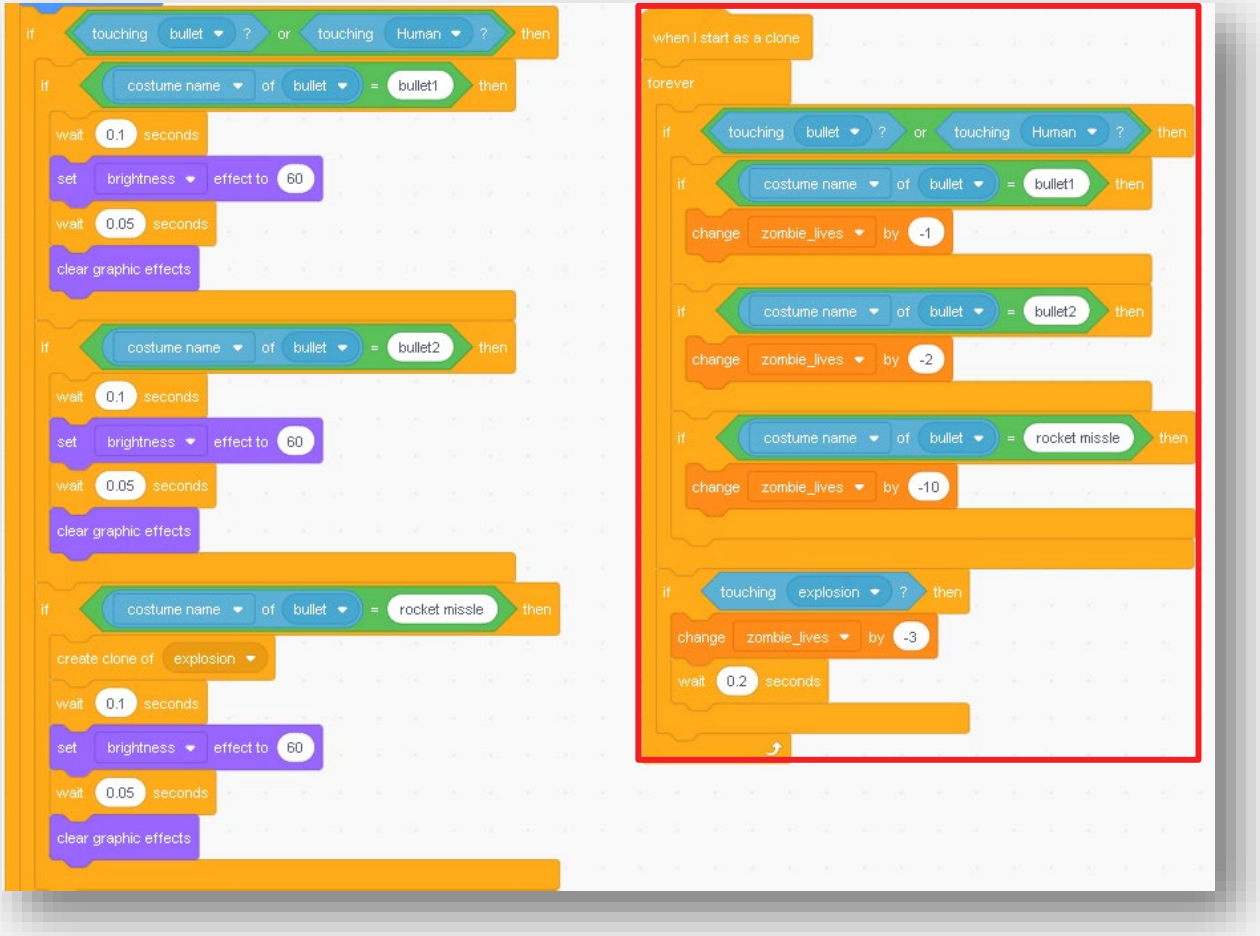
Then use this block and input the value according to different bullet.

Review - Click to Fire



As different weapon has different bullet and firing rate, so I will define a make block, then just input value to the make block to define the fire rate & bullet used for specific weapon.

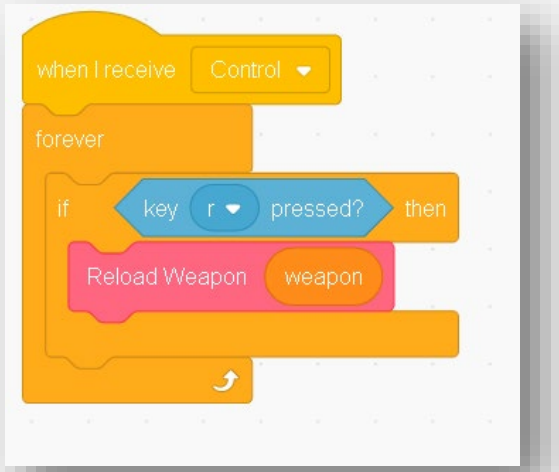
Review - Damage to Zombie

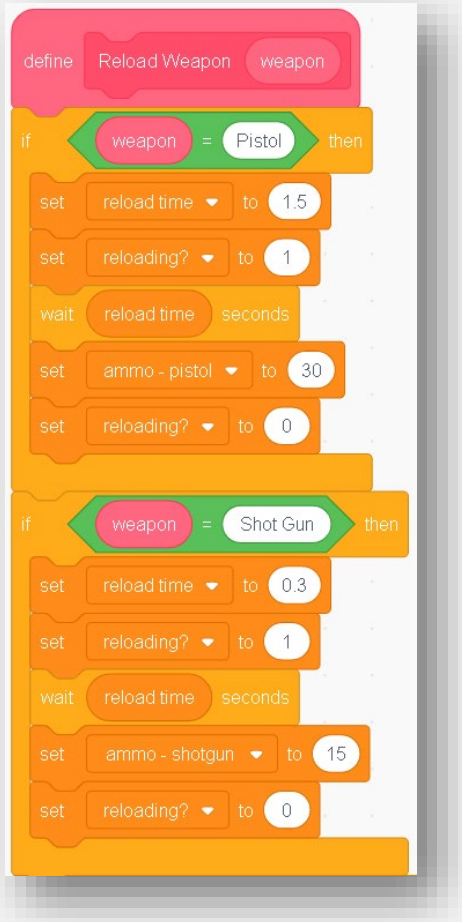


Different weapon will deal different damages to the zombie.

Therefore, I will need to deduct the live from zombie based on the damage dealt to the zombie.

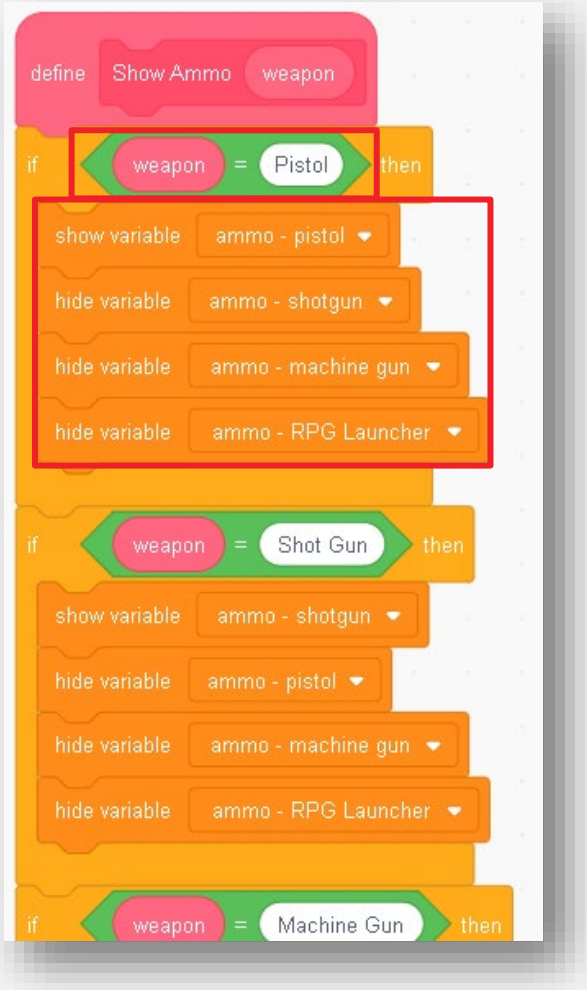
Review - Reload weapon





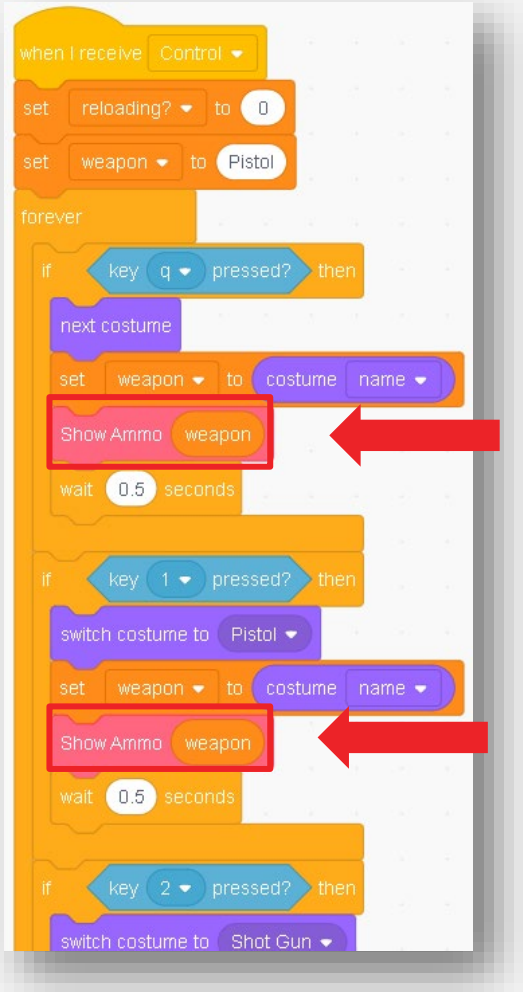
Each weapon has its own reload speed, Pistol is normal speed, Shot Gun is faster, Machine Gun very long, and RPG Launcher is around 2 seconds.

Review - Show Ammo Balance



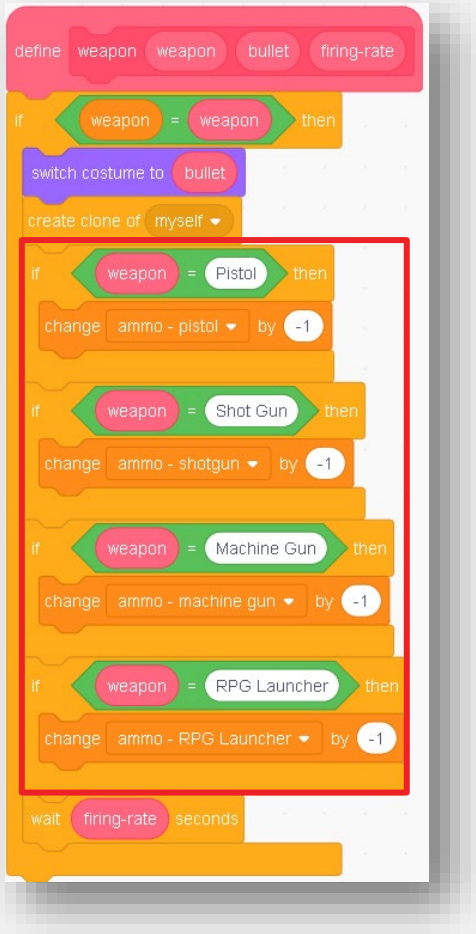
While switching to other weapon, I will hide other ammo's variables and only show the current one.

Review - Show Ammo Balance



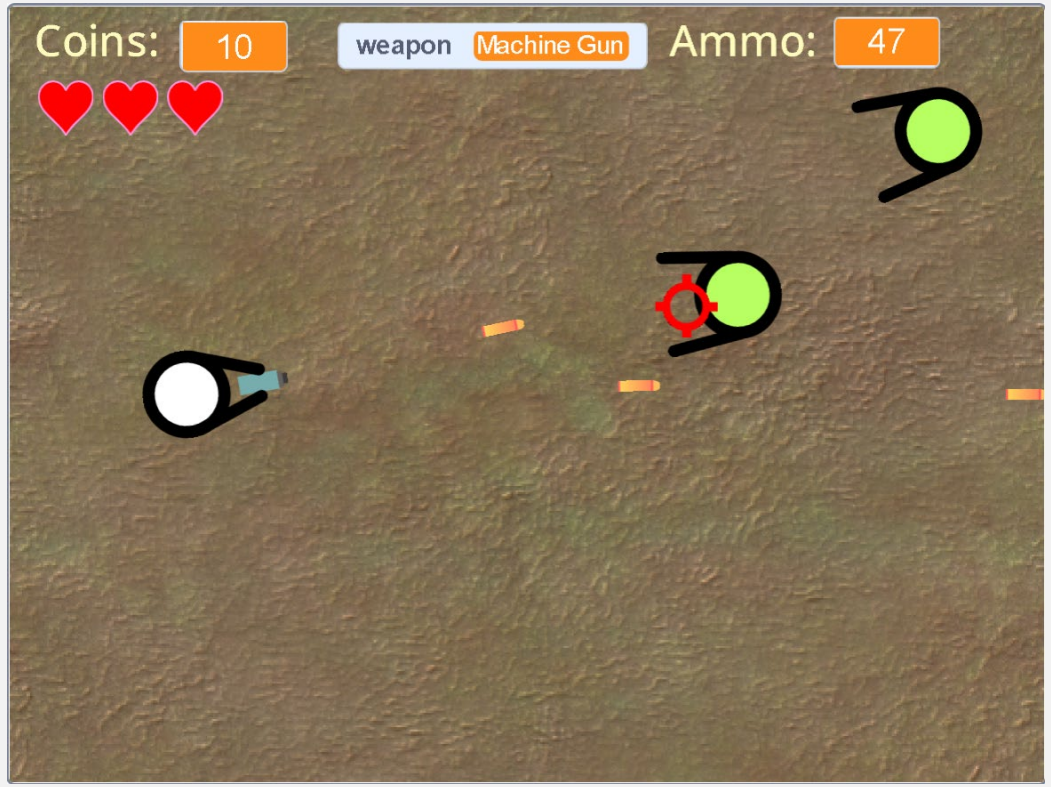
In your weapon switching keys there, you should add in "Show Ammo" blocks when doing weapon switching.

Review - Ammo Reduction After Firing



And at last, in your bullet script, the ammo to be reduced after firing shouldn't be "ammo", it should reduce the ammo with specific ammo variable such as "ammo – pistol", "ammo – Shot Gun", "ammo – Machine Gun", "ammo – RPG Launcher".

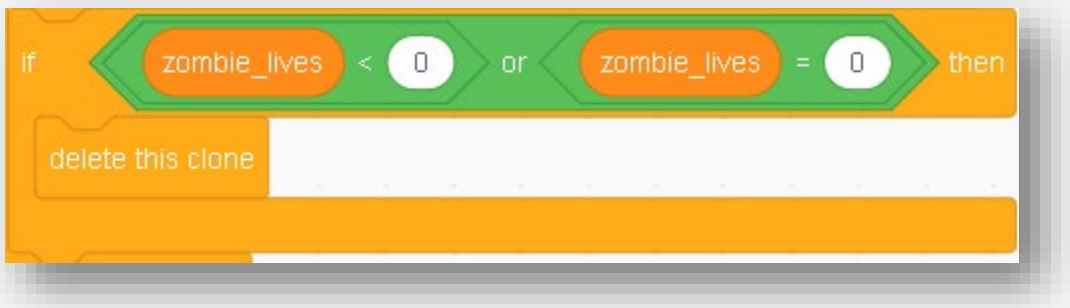
Add upgradable options



Let's add the upgradable options for the players:

1. **Damage**
2. **Reload Speed**
3. **Max Ammo**
4. **Movement Speed**

Setup Coins Variable



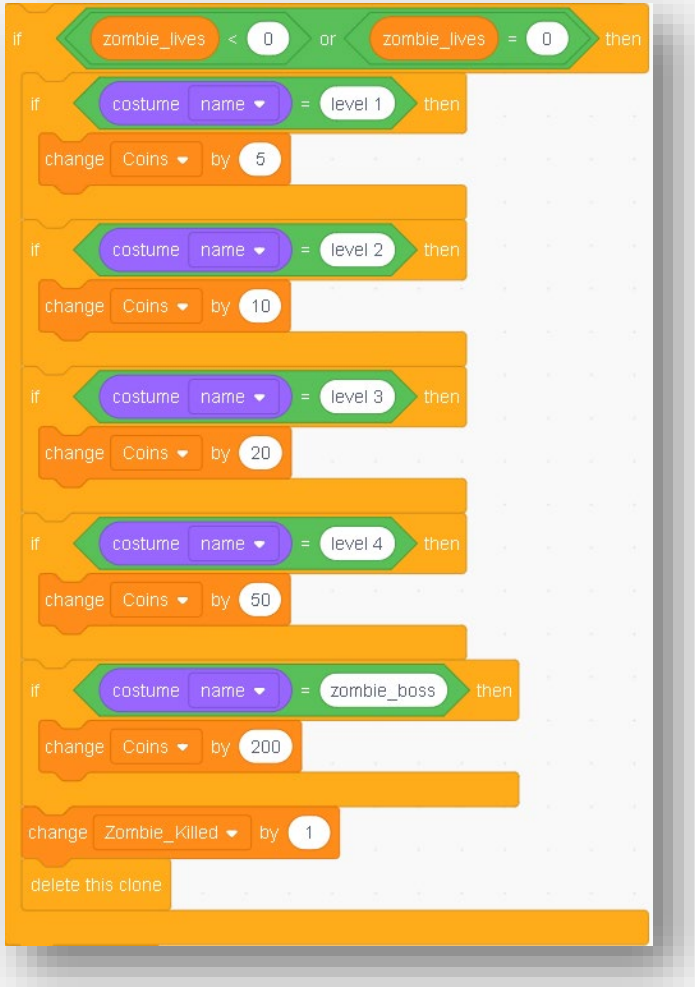
In the zombie's script, when start as clone, the zombie will have 3 or 6 lives, and when the life of zombie becomes zero, it dies (we just delete the clone of zombie).

Setup Coins Variable

In my zombie shooting game, I have 5 types of zombie ranged from level 1 to level 5 (zombie boss), and the higher the level of the zombie, the tougher it is.

So if the player kills level 1 zombie, he gets 5 coins, and level 2 = 10 coins, level 3 = 20 coins, level 4 = 50 coins and zombie boss = 200 coins.

Count every zombie killed



As I want the game to be like every 30 zombie killed, I will pop up an upgrade options for the player, and this will count as 1 wave.

The player gets to upgrade the perks for every wave.

So I added a variable called "Zombie_killed" to keep counting on zombie killed.

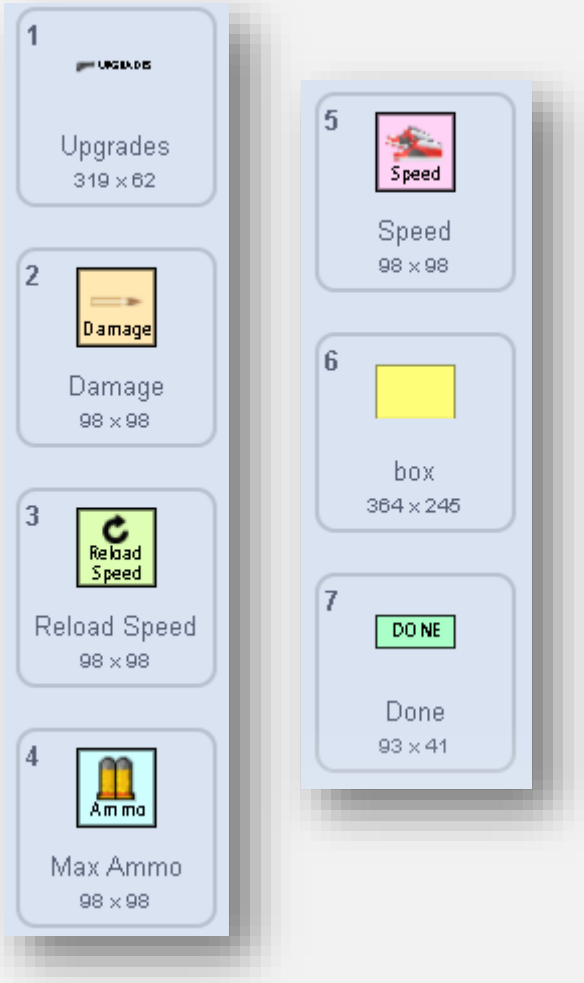
Store – For upgrades

Now let's setup a store for upgrades options.

After each wave (every 30 zombies killed), it will pop out this and let player to choose which to upgrade.

After all upgrades done, the player can select "DONE" and go back to the game.

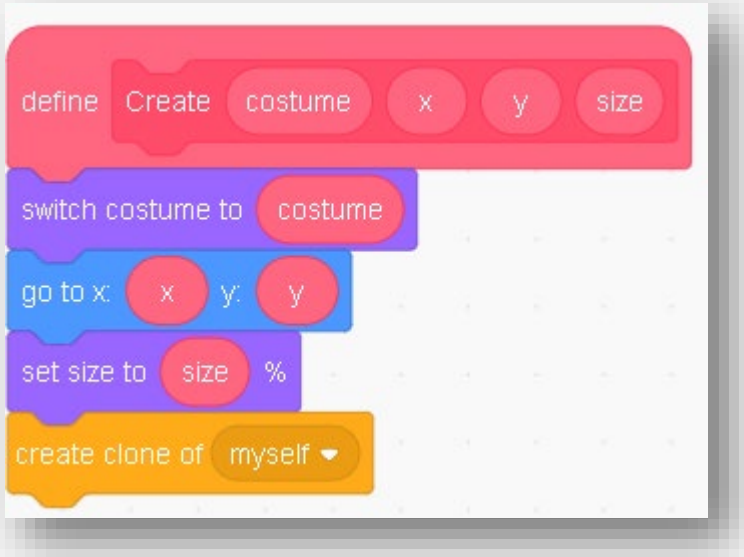
Store Costumes



What I need (costumes) for the store interface are:

1. **Title (Upgrades)**
2. **Damage (Clickable)**
3. **Reload Speed (Clickable)**
4. **Max Ammo (Clickable)**
5. **Speed (Clickable)**
6. **Box (as a board)**
7. **Done (Clickable)**

Store – Create Clones



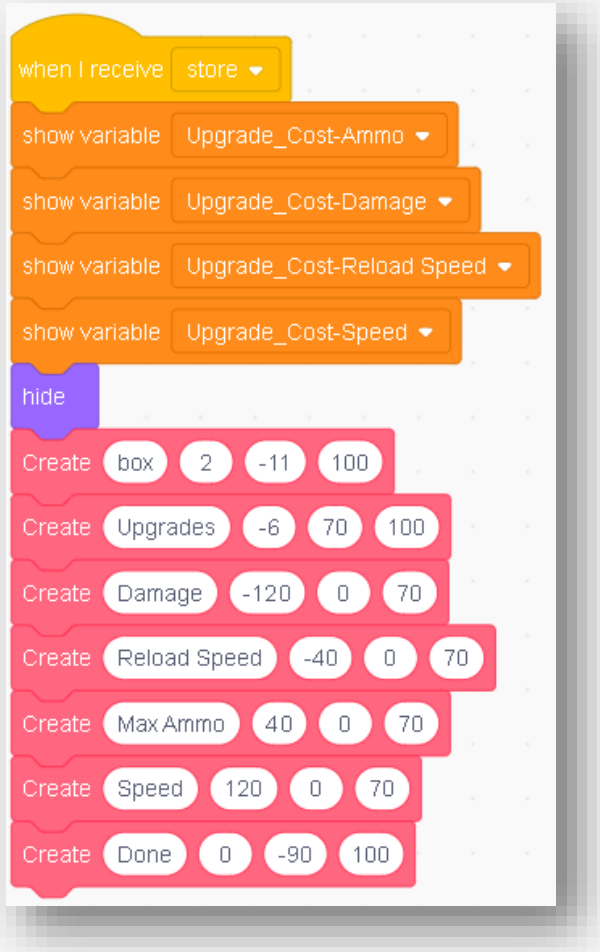
Like how we did it last time for our car race game, we make our own block and just key in the costume name, position, and size in our customized blocks.

Upgrade Costs - Variable

As each upgradable perk requires cost, and I will use variable to show how much it costs for player to buy.

My game here will set it to 50 coins at start to upgrade from level 1 to 2, then it will double up the price for next level.

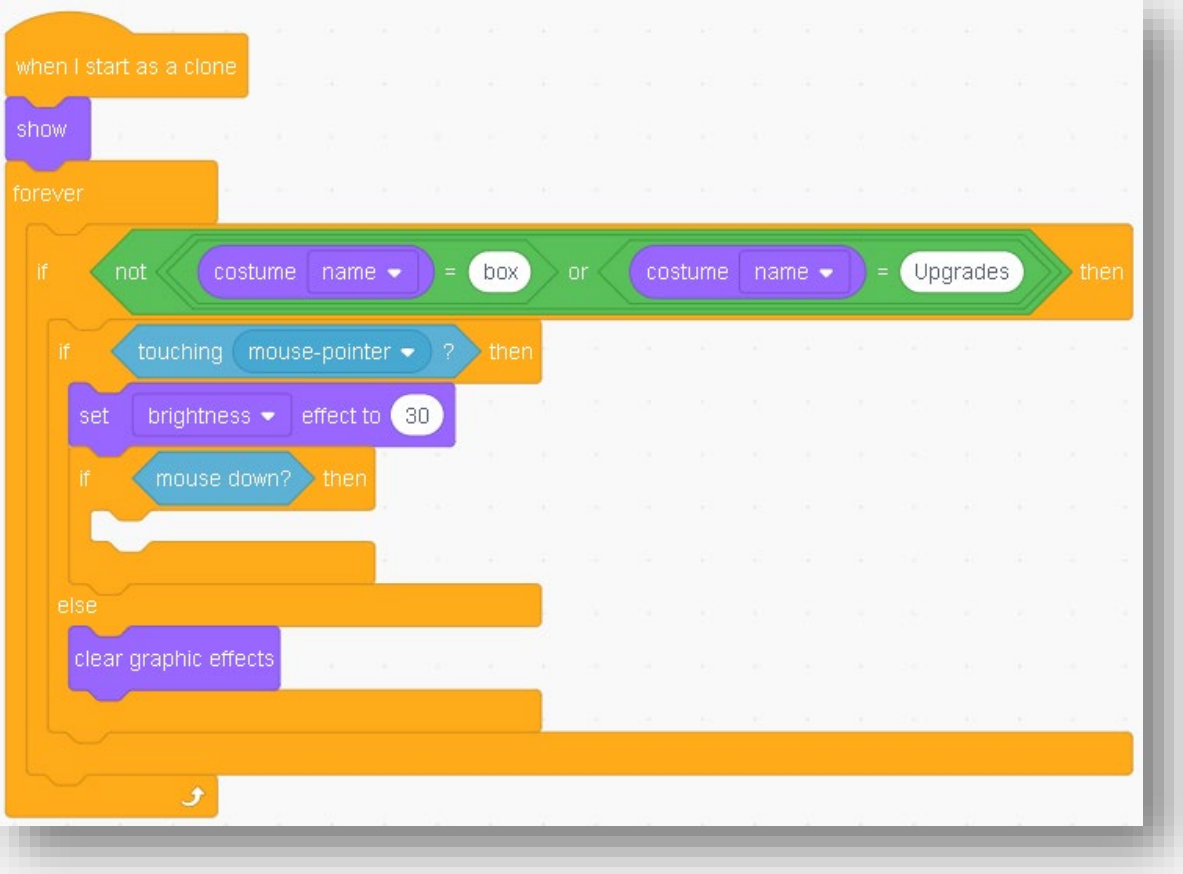
Upgrade Costs - Variable



Let's create all the variables, (I put "Upgrade_Cost-" in front of the name of every perks so it will be easy for me to program with the variable later.

I will use receive "store" message to call out the store's sprites.

Make it Clickable

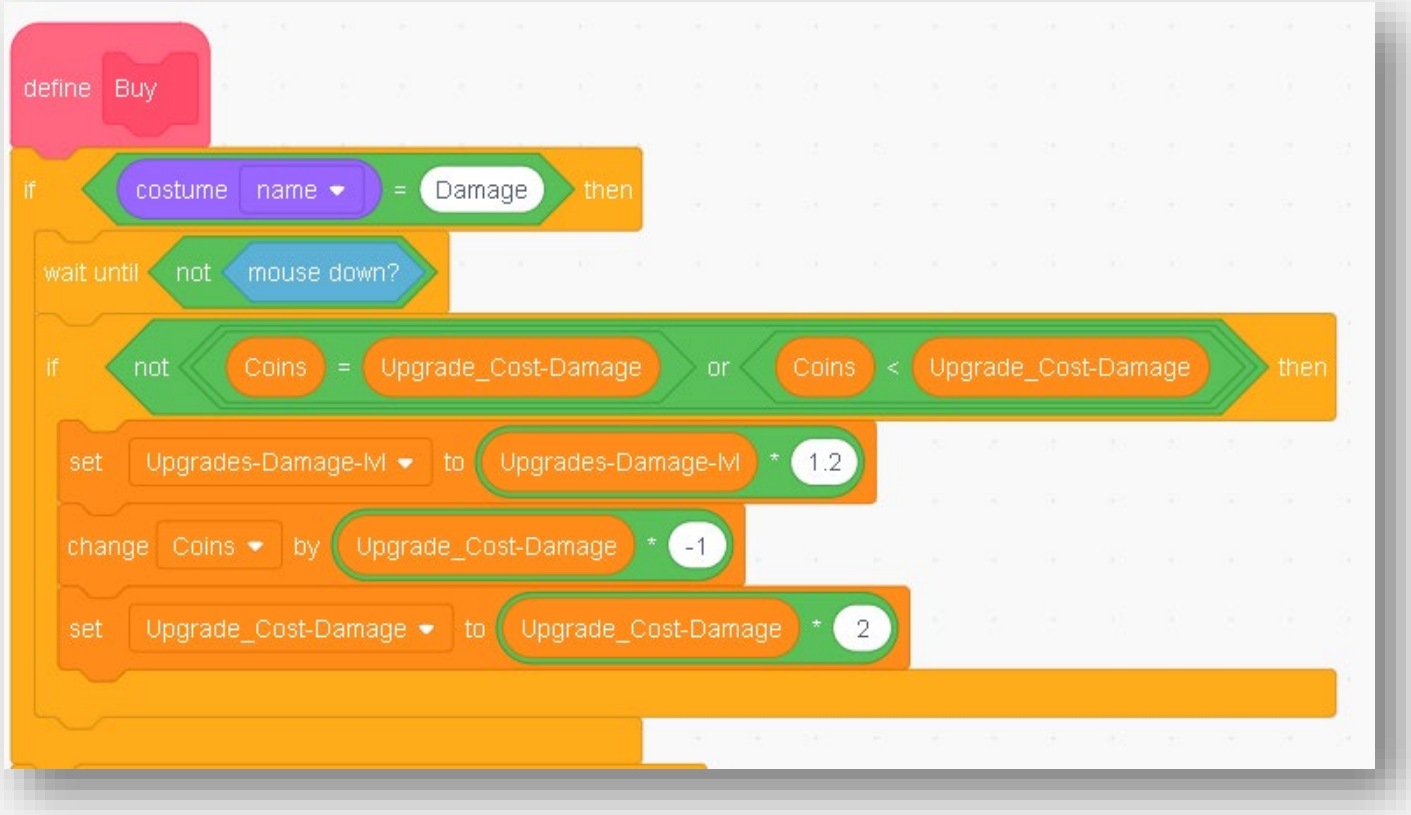


Now we want to make the clones clickable (except for "box" and "Upgrades").

This is similar to the button script.

The challenging part is what will happen after the player clicks on every button.

Make it Clickable



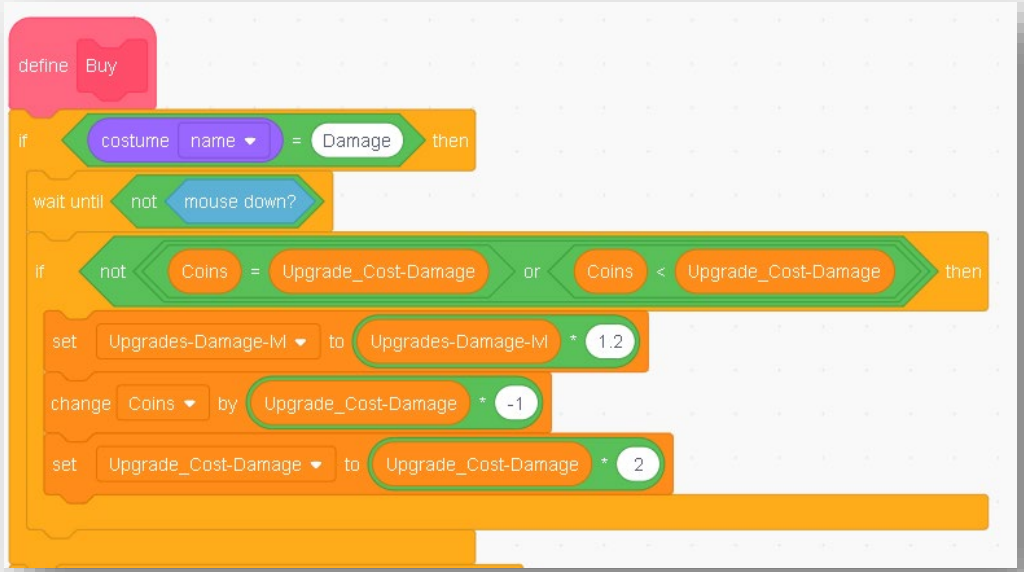
To make it easier to see how to check which perks were chosen by the player, I make a customize block for this.

Upgradable perks - Logic

This will involve in 3 variables which are “Coins”, “Upgrade_Cost-” and level of the perks).

We want to store the value of what is the level of my current perks, so I have created a variable called “Upgrades-(perks)-lvl”. This will be used to multiply with the base values of each perk.

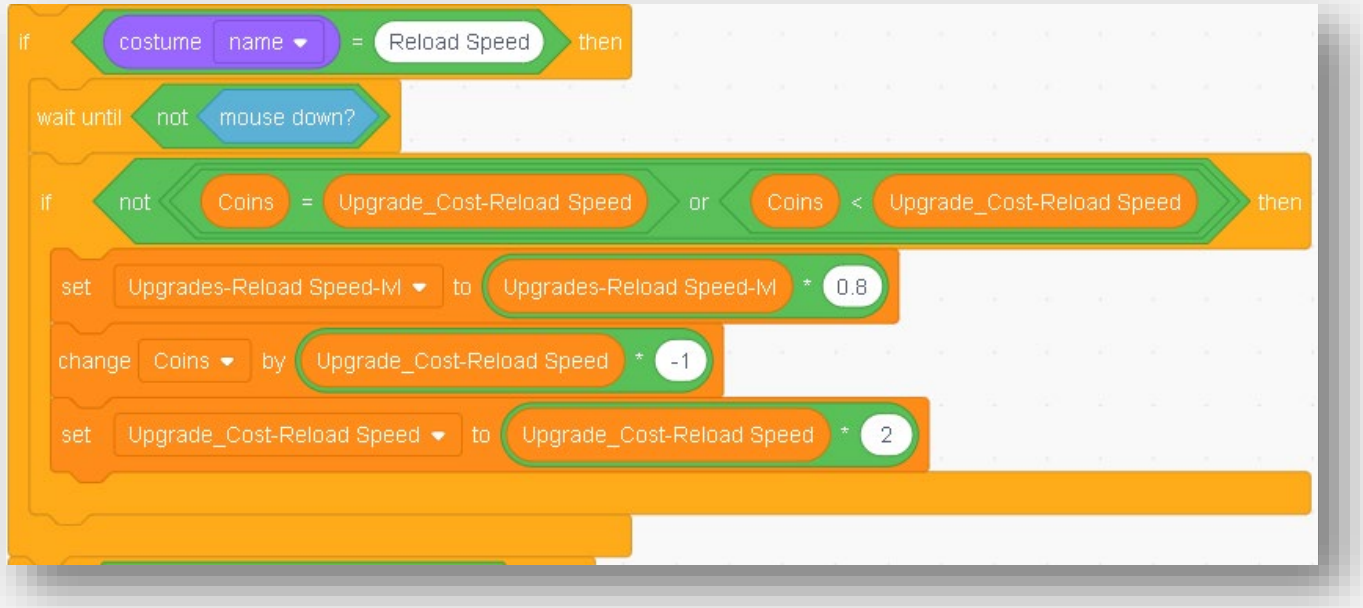
Upgradable perks - Logic



So here means I will check if player got sufficient coins to upgrade the perks or not.

If yes, then my level of perks will increase by 20% (multiply by 1.2). As player spent the coins on the perks, I will reduce the coins from player's pocket, and the costs for next upgrade is doubled.

Upgradable perks - Logic

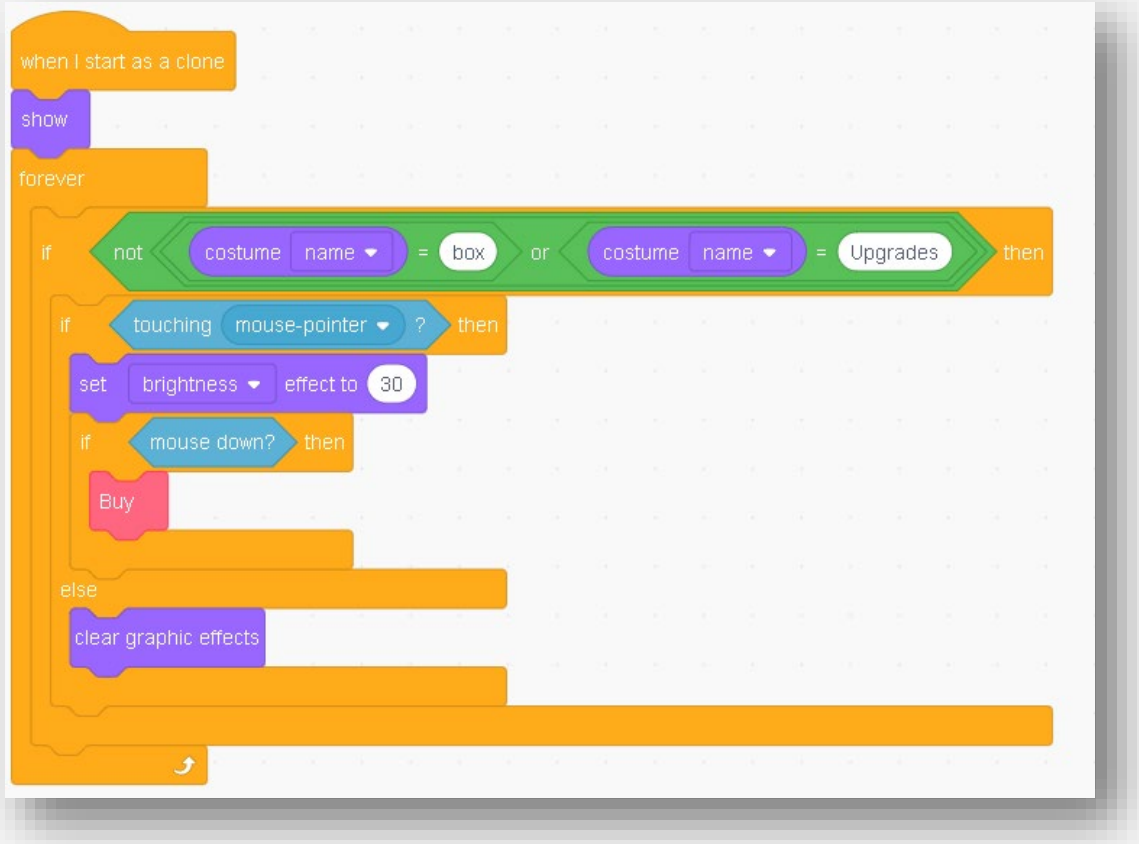


This will be same for other perks like “Reload Speed”, “Max Ammo”, “Speed”.

Done upgrades

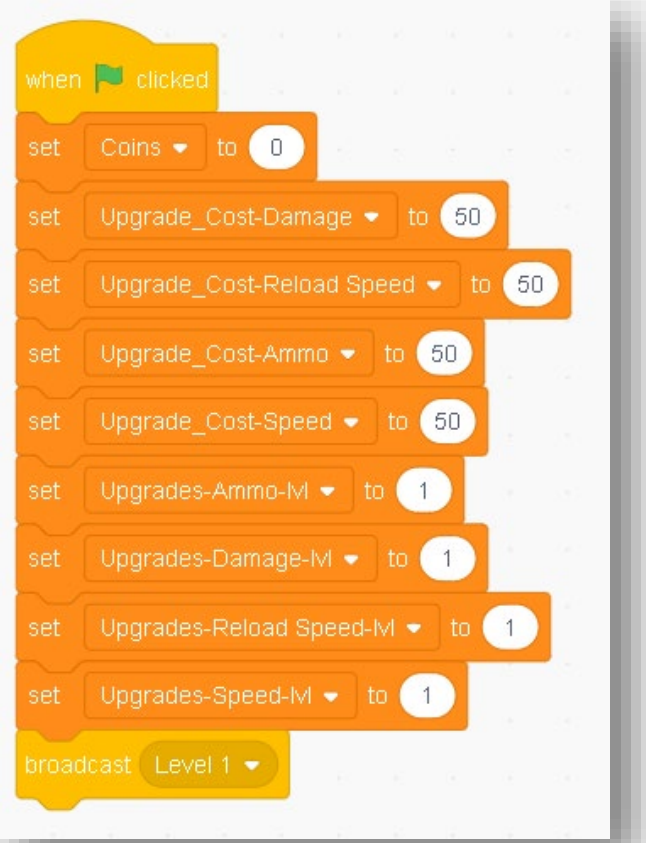
When done, I will broadcast a "Start Wave" to go back to the game again.

Done upgrades



Then we put the make block inside to “when mouse down”.

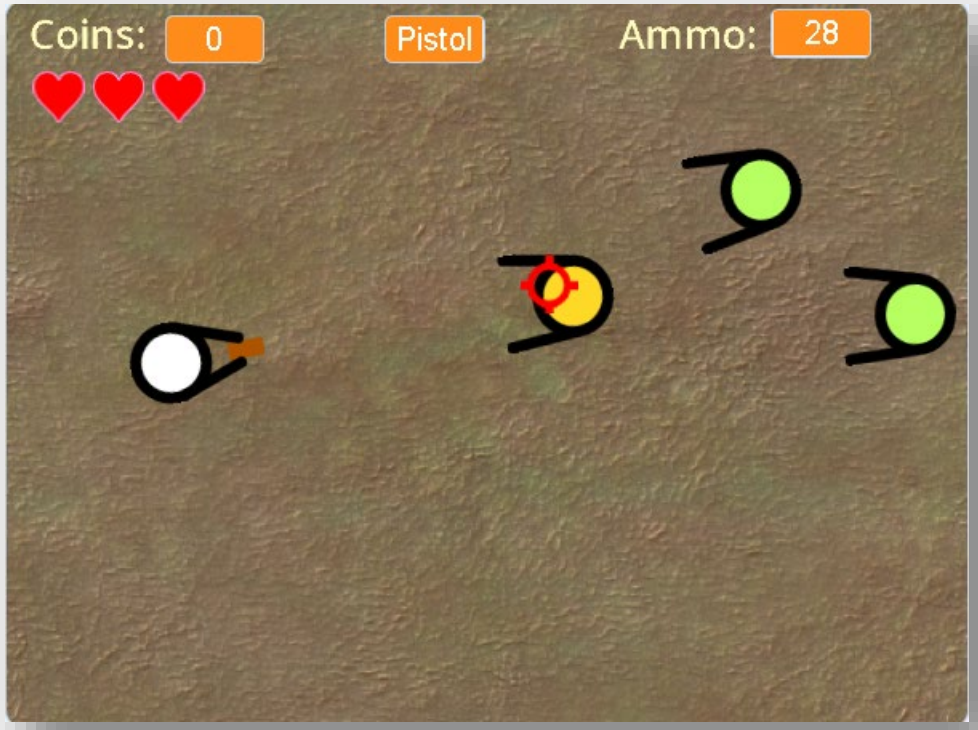
Set all costs and level at start



Now we need to set up all variables at start.

Go back to your Human sprites and add the setup to your scripts.

Upgrade is not applied to the damage



When you run your game, after upgrading the perks, you won't see any different in your skills, damage is still the same, ammo didn't increase.

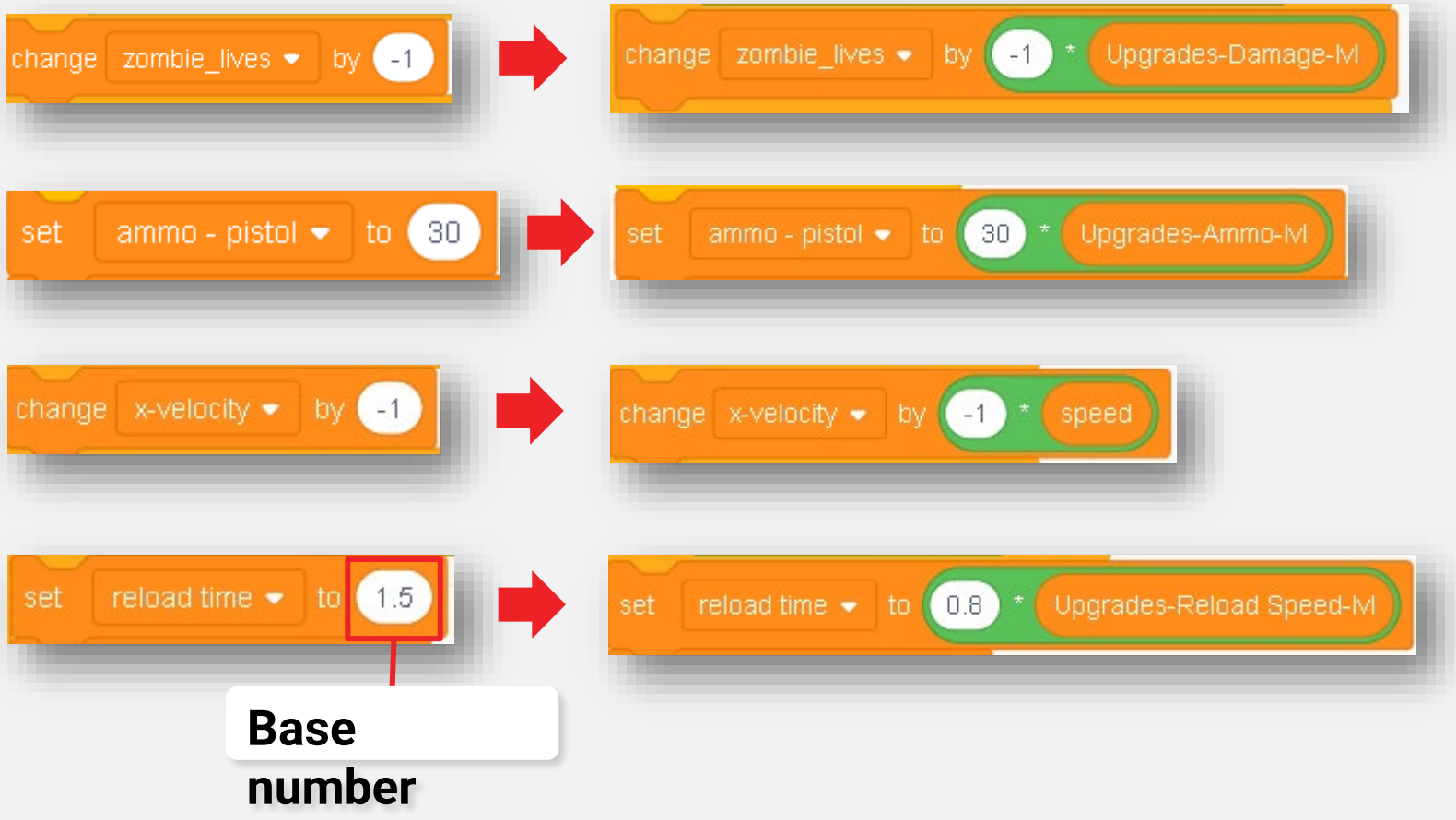
Link the upgrades to your damage

We need to go back to our zombie scripts and edit the damage dealt to the zombie.

Here, we use formula to calculate how much should we damage to the zombie.

So we will use the base damage multiply by our upgrades damage.

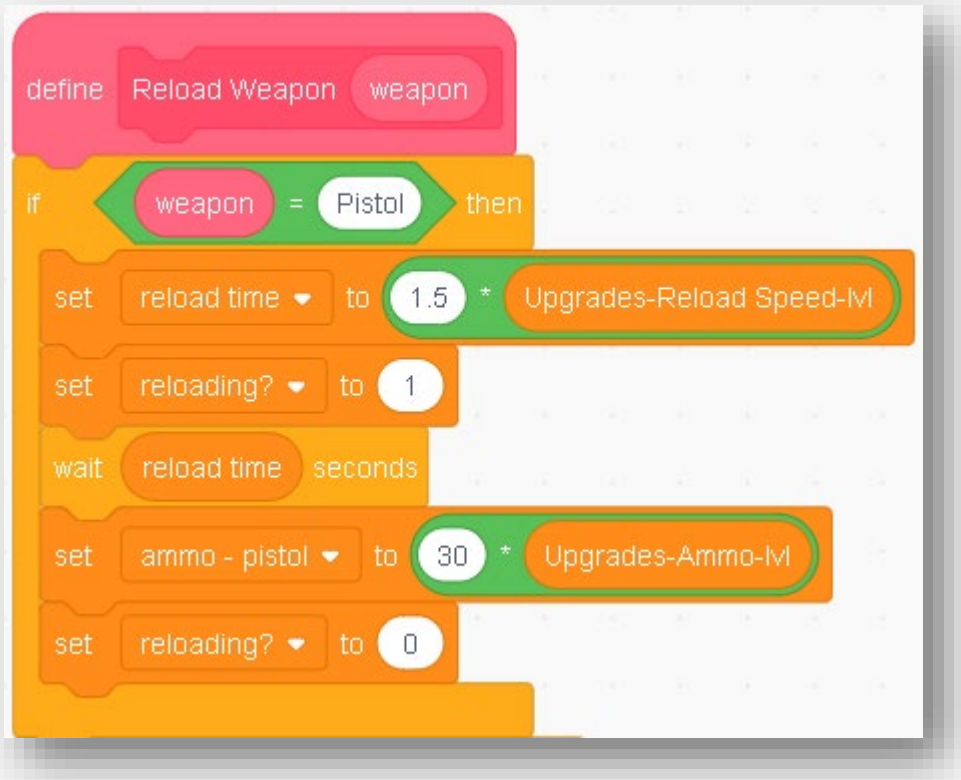
Link the upgrades to your damage



When we want something to be changed relative to a ratio, we can use the operator to do the multiplication for this.

And the starting number I will call it the base number.

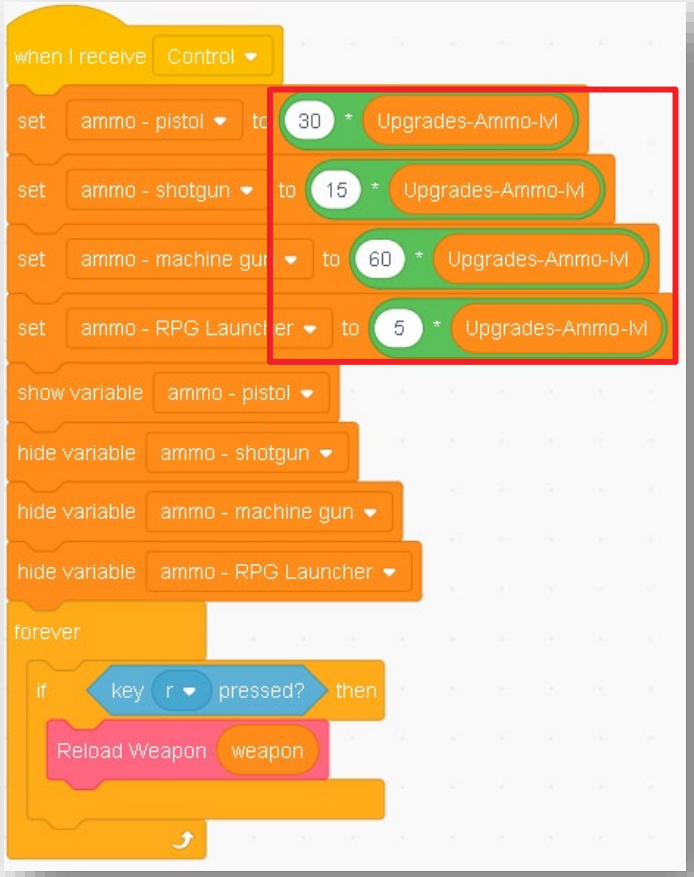
Reload Speed & Max Ammo

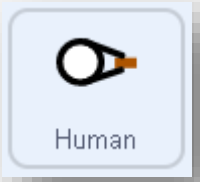


For the reload speed, I will set my reload time times the upgrades of my reload speed.

As every time I upgrade my reload speed, it decrease the value in my Upgrades-Reload Speed-lvl, so when I multiply it back to my reload time, the time should be shorter in result.

Linked to Max Ammo

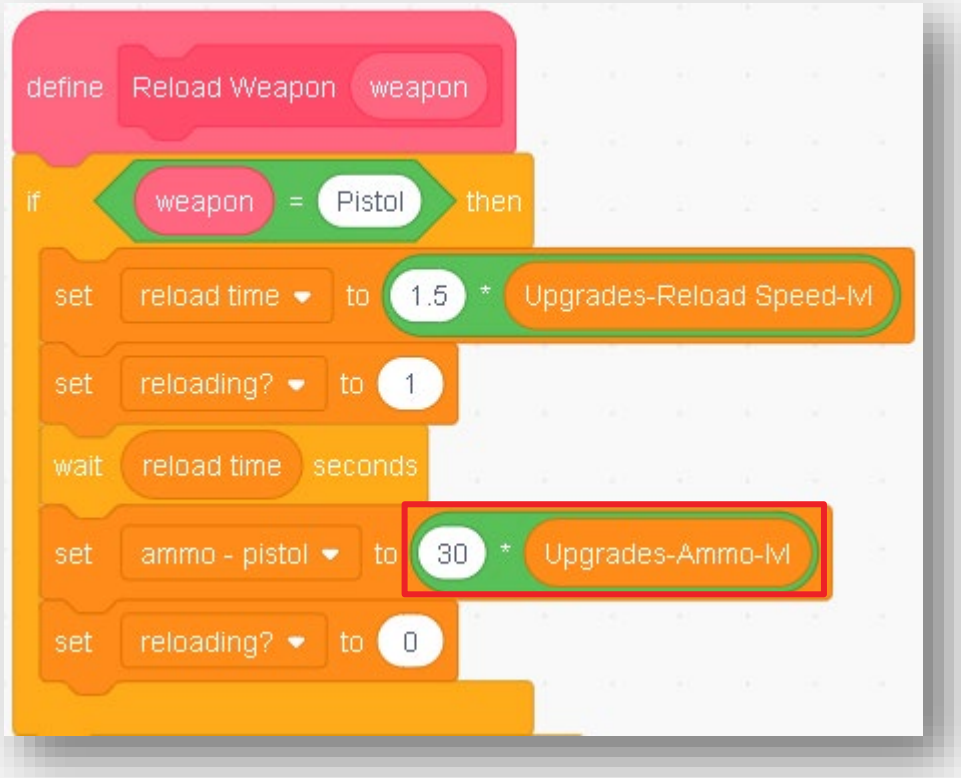




When starting my game, my ammo should base on the ratio of the upgrades of my Max-Ammo.

If I upgraded for 1 time, it should be 30 Ammos * 1.2 (Upgrades-Ammo-lvl, and your pistol now should be 36 ammos in max.

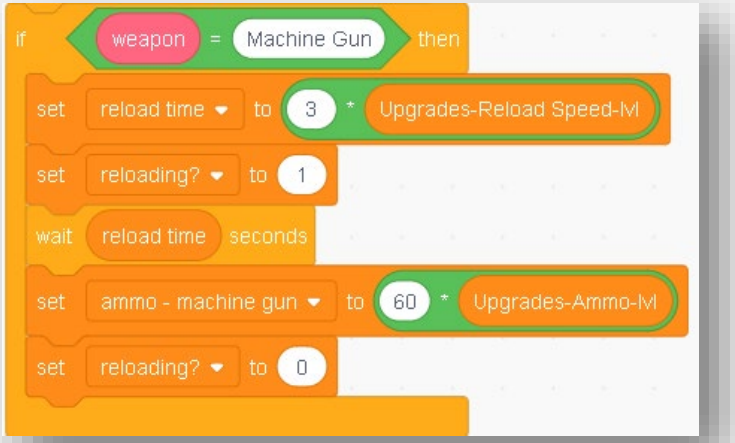
Reload to Max Ammo

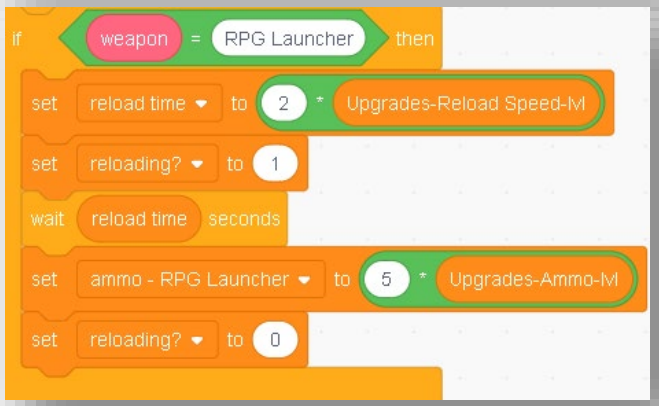


And of course when you reload your weapon, your ammo must be refilled back to max ammo.

Hence, you should do the multiplication to your base ammo in your reload weapon block.

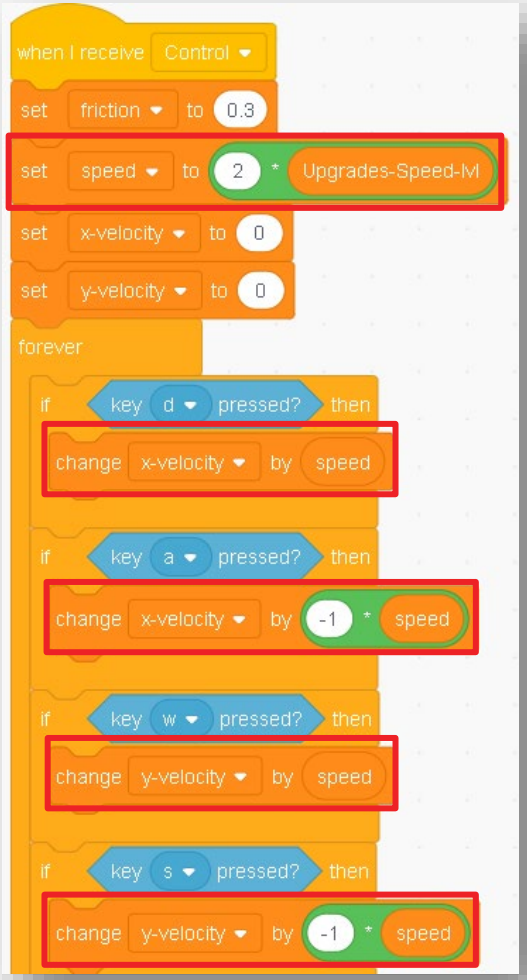
Apply to all weapons





Remember to apply it to all of your weapons.

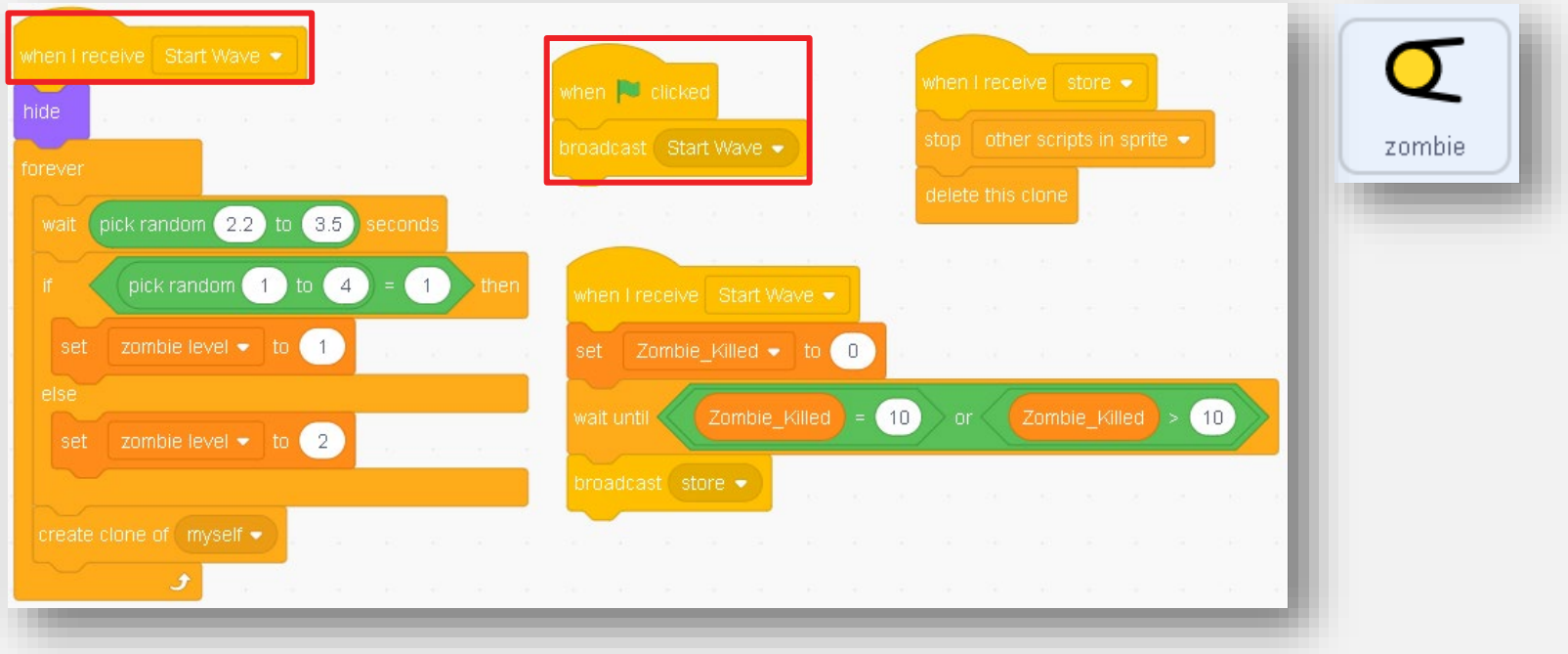
Link to Movement Speed



For the speed part, as we already set the speed variable for our movement speed, so it's very convenient for us to straight change the speed to base * Upgrades-Speed-lvl.

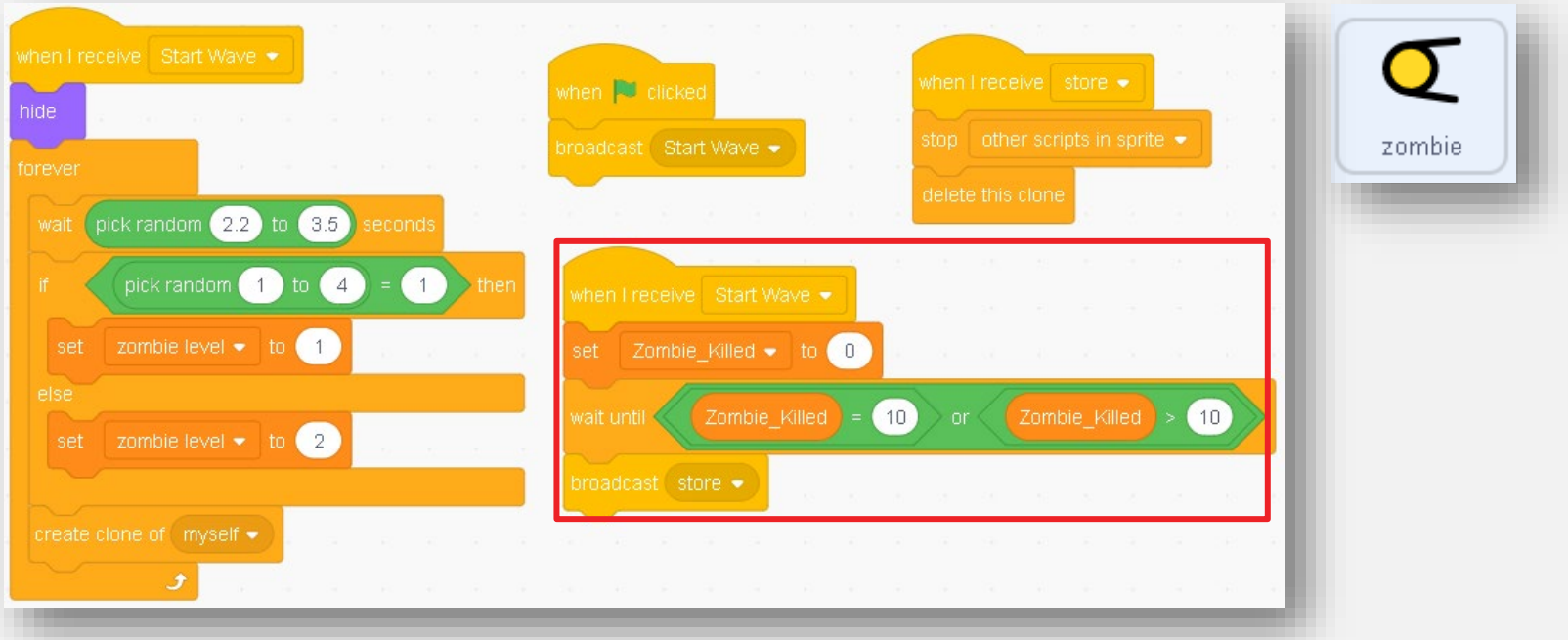
If you didn't set your speed at the top for changing x- & y- position, you may need to do for all controls in <w> <s> <a> <d>.

Zombie Script – Call for Start Wave



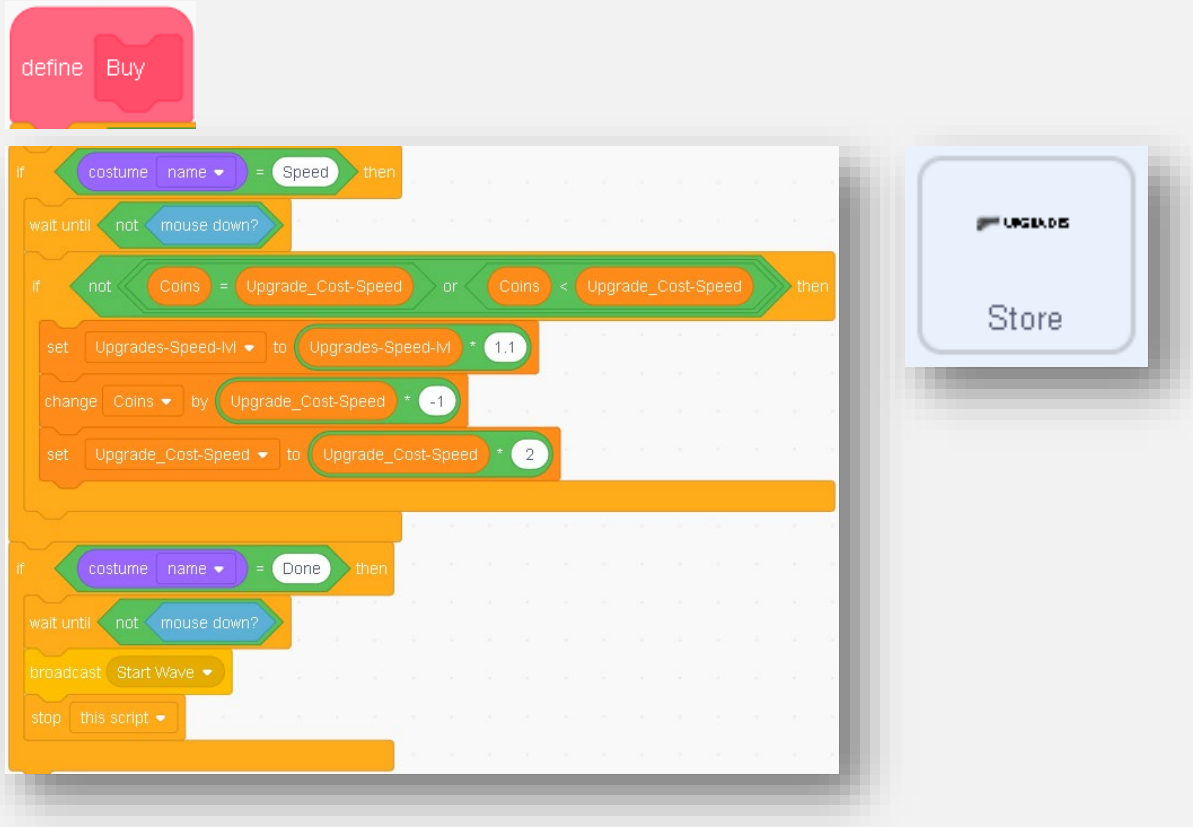
As I have different waves for my zombie, I will set that each time when zombie starts to spawn at the right side as “Start wave”. The zombie will be spawned only when I call up (broadcast) the “Start Wave” message.

Wave by Wave



And after I call up the "Start Wave", it will set the Zombie_Killed back to zero and start counting on number of zombies killed.
Once it reached 10 zombies, I will broadcast "store" and ask player to upgrade perks and stop the zombie from spawning and delete all clones for zombies.

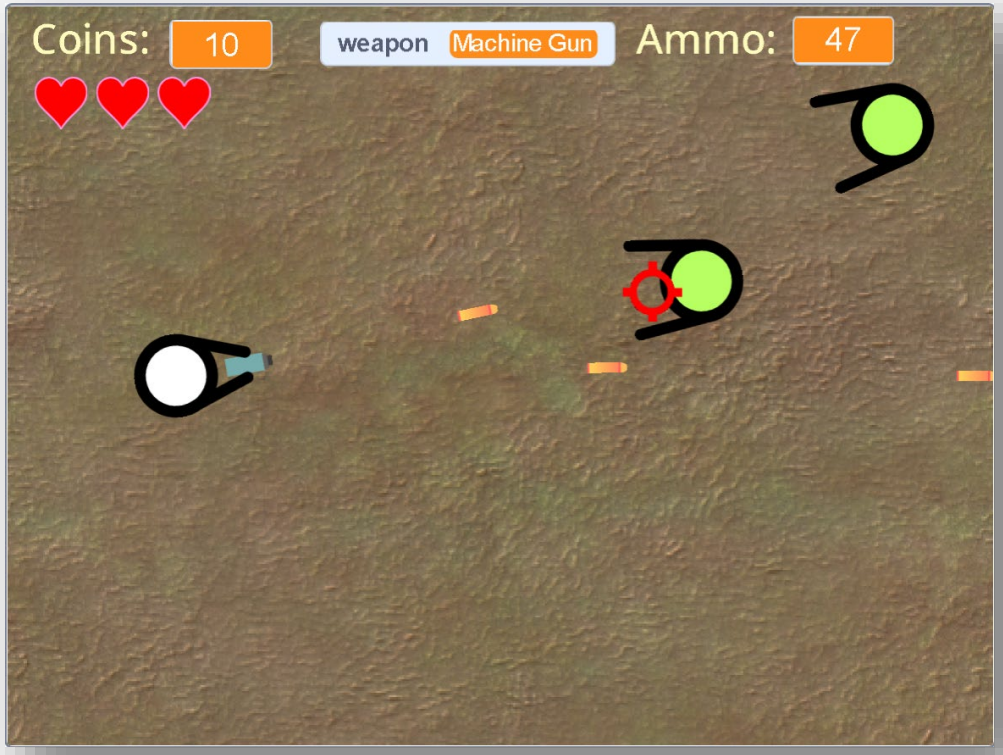
Done upgrades & Start Wave



Go back to your store sprite, you can see under your "Buy" block, there's one checking if player done the upgrades.

Once the player clicked "Done", it should broadcast Start Wave and the next wave will start again.

Done the Upgradable Perks



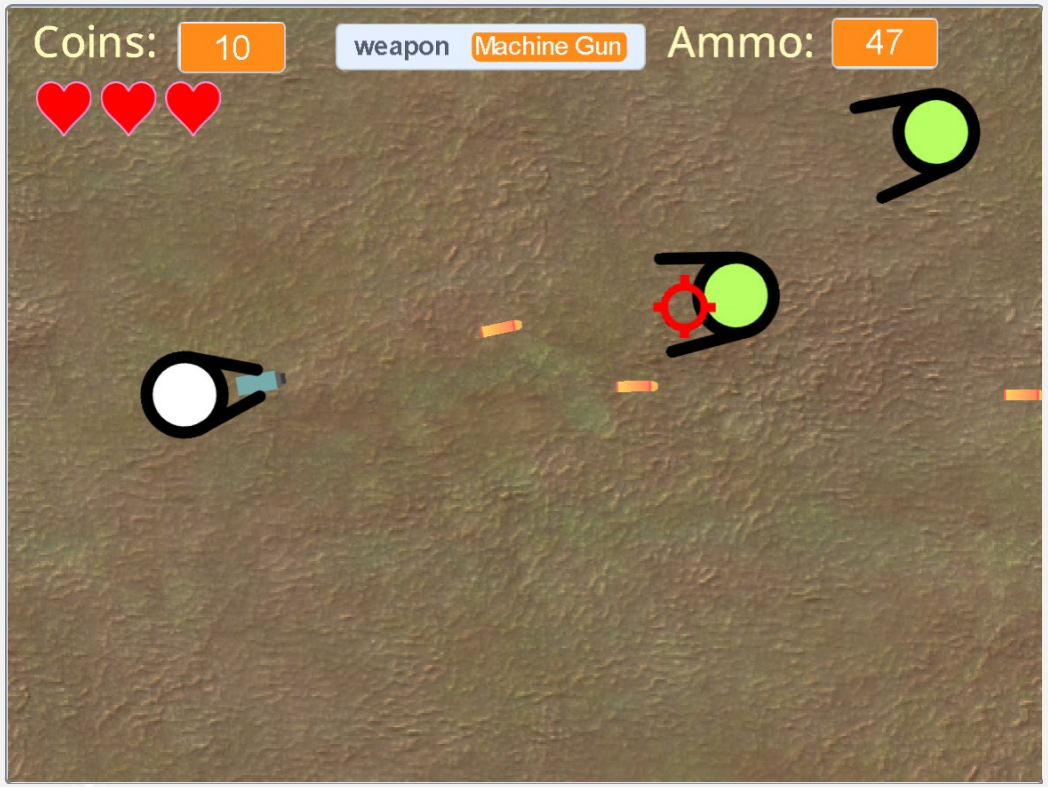
And this is how we program the upgradable perks for our games.

If you have more upgrades, you will need to put more times in designing the rules and program it.

But it will make the enhance the game experience for the players. And the better the experience, the better profit a game developer can make.

ASSIGNMENT *for*

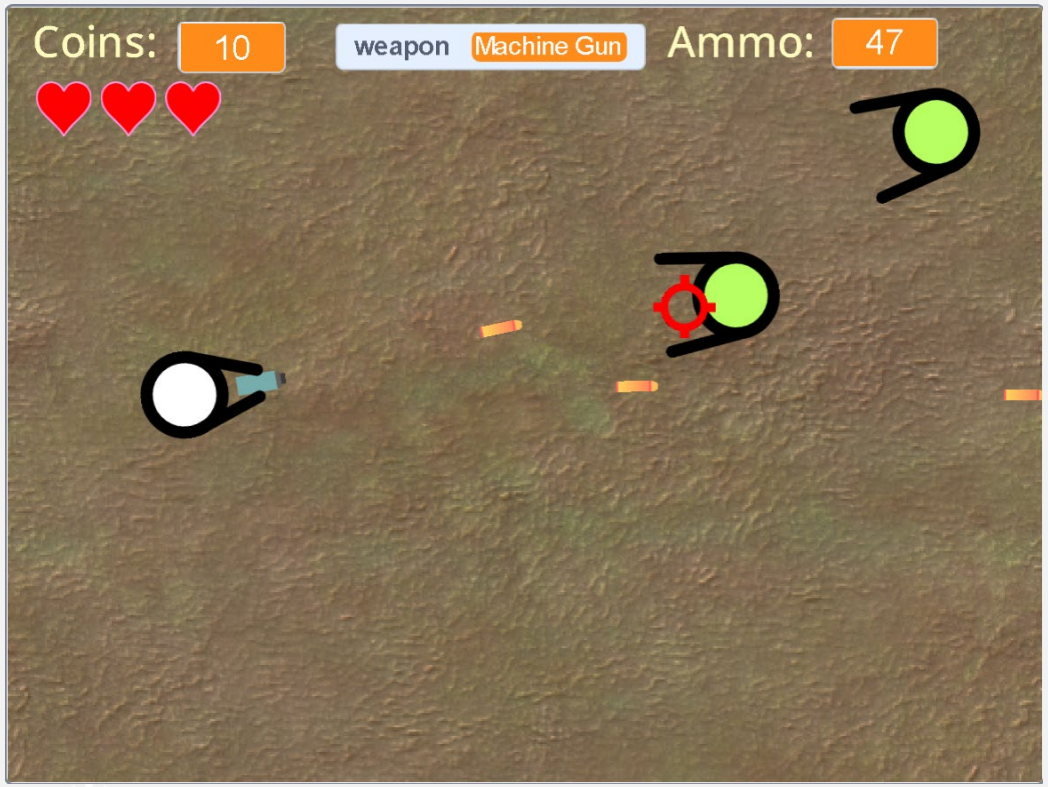
Lesson 2-12



L2-12 – Mission

Add the upgradable skills into the games so that player can choose either to upgrade:

1. **Damage**
2. **Reload Speed**
3. **Max Ammo**
4. **Movement Speed**

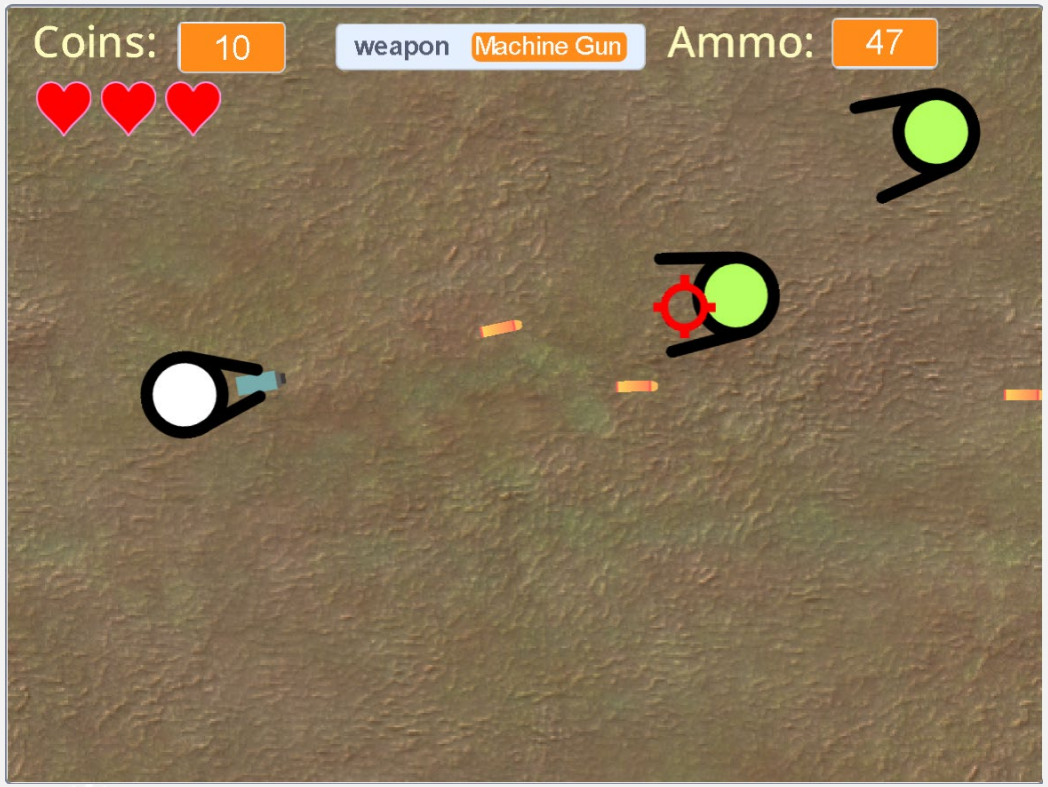


Extra Challenge

Can you try to do different waves of zombies in the game?

Each 30 zombies killed, will come out a zombie boss, then if the zombie boss is dead, then it will start another wave.

The higher wave (higher level), the zombie will become tougher and tougher.



Adcoins Rewards

Adcoins Rewards:
1500 ~ 3000 Adocoins

The reward is based on:

1. **Gaming experience for player**
2. **User interface**
3. **Challenging for player but manageable to complete**
4. **Upgradable perks (guns, skills)**
5. **User Interface**
6. **Graphic of the game.**

You can direct message your teacher and ask your question through Slack Robotene Community or arrange a One-to-One Consultation with your teacher.

Any Questions?

Thank you :)