Lesson 7 – Making Games

Games of all types have a positive impact on children.

Overall they enhance a child's physical, social, cognitive and emotional well-being.

Having learnt animation and coding sprites, **making computer or video games** is the next logical step in a childe journey.

Children play with such games all the time. However, the **very idea of making & then playing** with peers can be a major motivation for any child.

In the next two lessons we shall learn the fundamentals of making computer games.

What is a Game

A game is a **system of actions** in which players
engage in an artificial conflict or dual or friendly contest
defined by **rules**
that results in a **quantifiable outcome**.

What are Computer & Video Games

Computer Games are a form of virtual gaming where players interact with objects displayed on a screen, for the sake of entertainment.

They involve **interaction with** a user interface or input device such as joystick or motion sensing device, that generate **visual feedback for a player to respond to.**

Video game is essentially the same form of entertainment, but refers not only to **games** played on personal computers or similar device, but also to games run by a console or arcade machines.

Computer games

These are programs, visualised and **written by coders** that enable one or more players to interact with a **virtual gaming environment** for entertainment and fun.

There are many types of computer games available, ranging from traditional object or card games to more advanced games such as **role playing games** and adventure games.

Term "computer game" also includes games which display only text or which use other methods, such as sound or vibration, as their primary feedback device, or a controller (console games), or a combination of any of the above.

Advantages of Computer Games

For the creator, learning to make computer games improves:

- Visualisation & converting it to a story with seamless execution.
- Sense of sharing, accepting feedback and improving.

For the players, they provide:

- Entertainment & fun.
- Planning ones strategy.
- Improving problem-solving skills.
- Improving hand and eye co-ordination.
- Accepting the result with a desire to improve.

Types of Computer Games

Generally, we can classify computer games into card games, board games, puzzles, maze, fighting, action, adventure, role playing, strategy, sports and simulation games.

However, the classification is a fuzzy concept, as **many games are hybrids** that fall into more than one class.

In this lesson, we shall learn the **basics on making simple computer games.** Once the basics are understood, game complexities can always be enhanced to cover the above types.

Computer Game Architecture

A typical computer game architecture consists of:

- Input.
- Game Logic.
- Graphics/Sound Support.
- Game Output.
- Networking.

We shall focus on the first four.

Most games are designed as a C/C++ application program.

However, we will initially design games using Scratch & later using Python.

The architecture for its designing will remain the same as for C/C++.

Networking in Games

It provides networking protocol support that allows **several users in remote locations** to play and interact in the same game environment.

In a networked game environment, a server is needed to **maintain information flow** with the players.

We shall **nor get into** this aspect of gaming.

Let us make some Simple Games

Project 1 - Making a Simple Computer Game

While explaining we shall go over the **fundamentals behind** the four pillars of any games architecture:

- Input.
- Game Logic.
- Graphics/Sound Support.
- Game Output.

Once understood, making games **as per imagination** will become easy.

The Story Line

The story line of this game called Hungry Rabbit is:

- Carrots are falling from the sky.
- The Rabbit must catch these Carrots.
- Score will increase with each Carrot caught.
- Let’s see how many carrots the rabbit can catch?

Method of Coding

In this game, the Rabbit must catch the carrots falling from the sky.

To gamify it, he must be controlled by us.

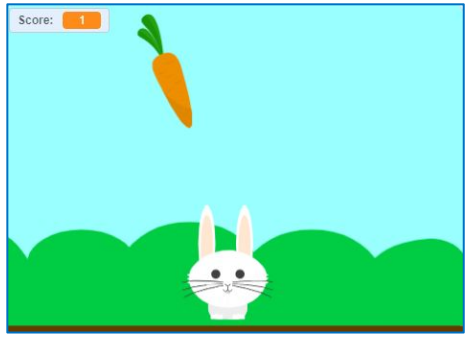
For this, we need to give it some **control conditions**:

- If ← key is pressed, the Rabbit moves left.
- If → key is pressed, the Rabbit moves right.

More the conditions we give, more complex it becomes.

When the Rabbit catches a Carrot:

- The Score should be increased.
- It should also be displayed on the screen.

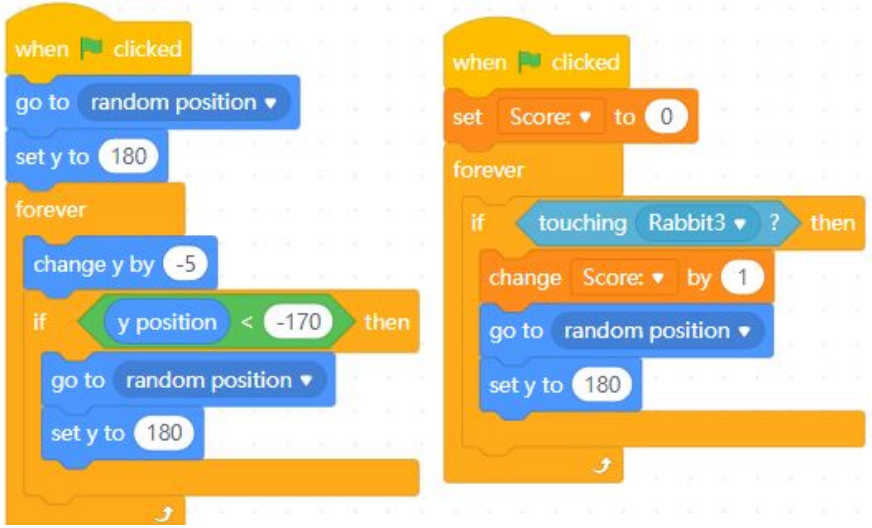


Carrot fall randomly on their own. Thus, they **require no conditions.**

The trigger to start the game is **When Green Flag Clicked.**

Final Code

Code for Carrot



Code for Rabbit

Project 2 - Making a Simple Game with Sound/Graphics

This game will be a similar to the earlier game.

However, in this game we will **include sound.**

At this level, we will not get into graphic support.

Story Line. The story of this game called Bat and Bug is:

- There are two flying creatures.
- One is big and powerful – Bat.
- The other is small & vulnerable – Bug.

- The game involves keeping the smatter one from touching the bigger.
- In case the smaller touches the bigger, he will get poisoned and fall down.

- A loosing sound will be played and the game will be over.

Method of Coding.

In this game the Bat moves on its own. Thus, it requires **no control conditions.**

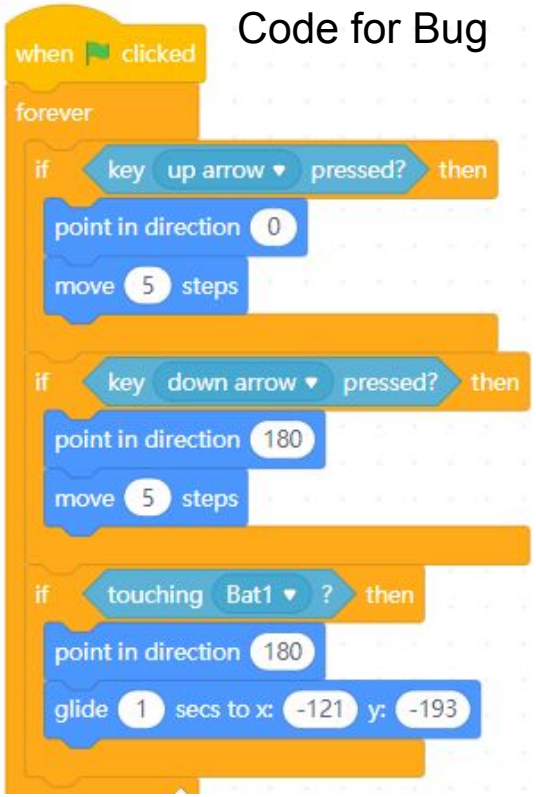
The Bug must be controlled by us. Therefore, we need to give it **some control conditions.**

These are:

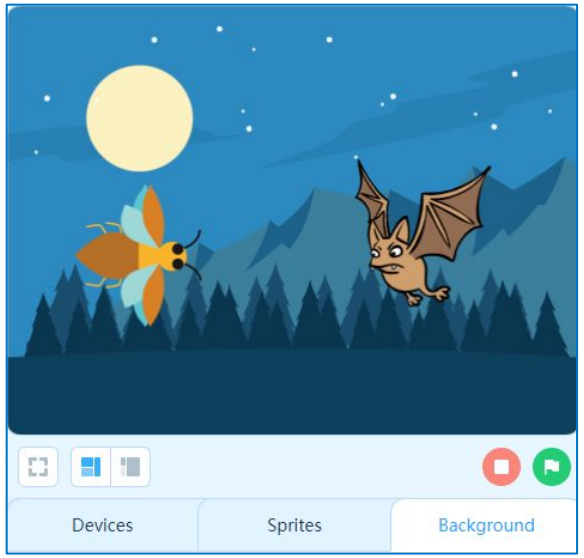
- If ↑ key is pressed, the bug moves up.
- If ↓ key is pressed, the bug moves down.
- If ← key is pressed, the bug moves left.
- If → key is pressed, the bug moves right.
- If the bug touches the poisonous bat, it falls (moves) down.

Final Code

Code for Bug



View of Stage



Code for Bat

Project 3 – Panda's Space Adventure

This game will be a similar to the earlier game.

However, in this game we will **include Background Music.**

Story Line. The story of this game is:

- Panda is travelling in Space.
- Stones and Medical Kits are coming from right side of the screen.

- If the Panda touches the stones, its size will decrease by 10%.
- If he touches the medical kits, its size will increase by 10%.

- Panda's health score will keep increasing & decreasing accordingly.
- If his Health score drops to zero or less the Game is over.

Let's see how long we can help panda survive?

Method of coding.

In this game the Panda must be controlled by us.
Therefore, we need to give it some control conditions. These are:

- If ↑ key is pressed, the panda moves up.
- If ↓ key is pressed, the panda moves down.

Stones & Medical Kits move on their own. No conditions.

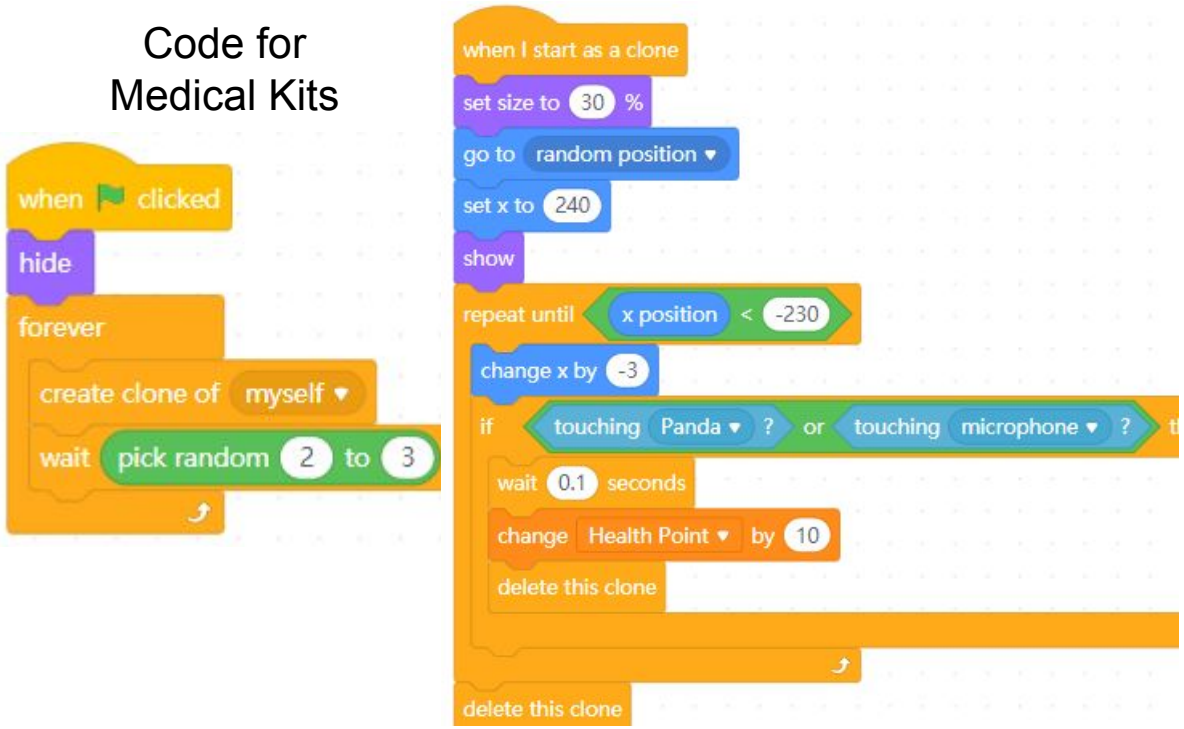
Background music with background is a separate code.

To do this go to background & add music of your choice.

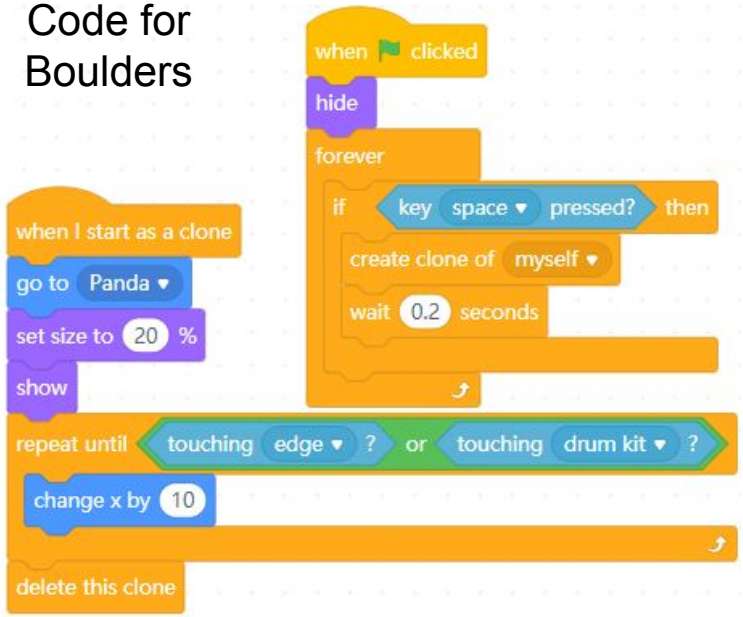
Enclose the music block in a forever loop to play it from the start to the very end.

Final Code

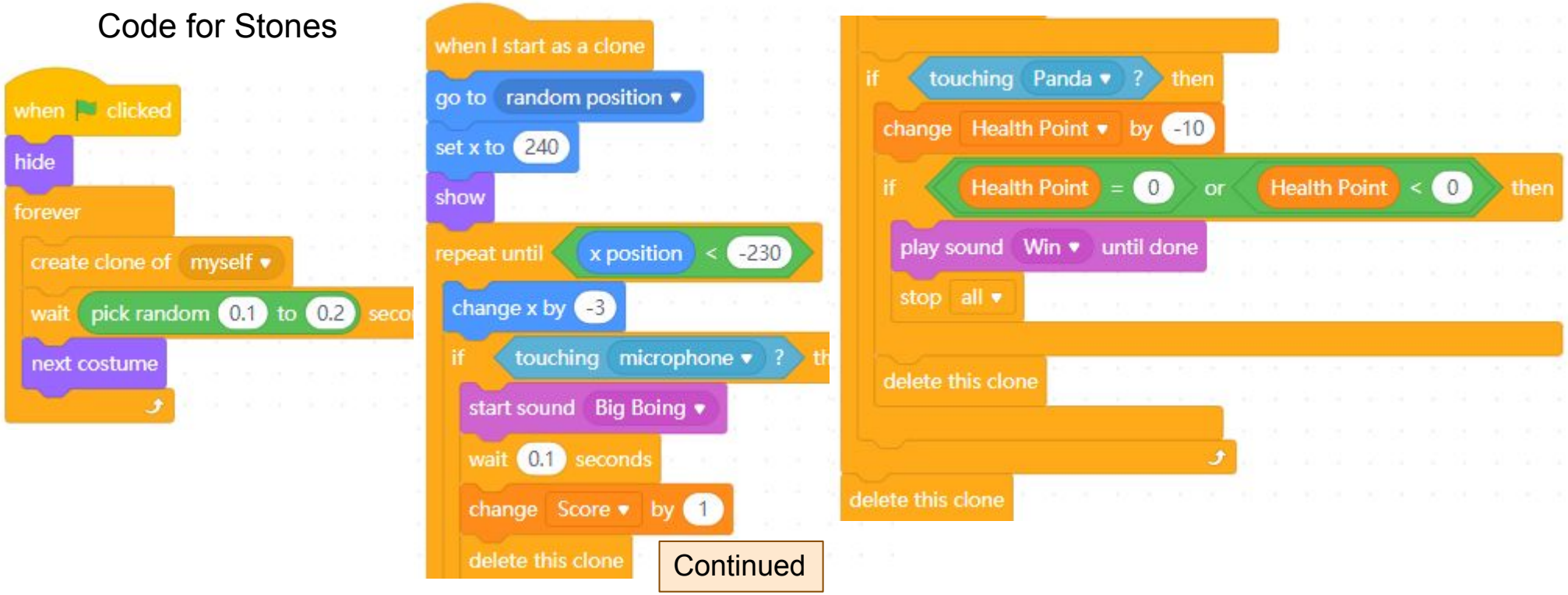
Code for Medical Kits



Code for Boulders



Code for Stones



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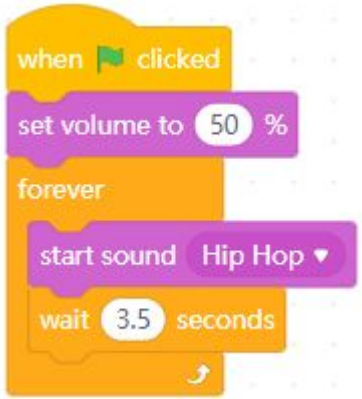
Code of Music



Code of Panda

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Code Karega India Badhega