National University
of computer and emerging sciences

LAB 02

Summary

Items	Description
Course Title	Programming Fundamentals
Lab Title	Algorithms and Scratch
Duration	3 Hours
Operating System/Tool/Language	Ubuntu/ Scratch/ C++
Objective	To get familiar with Scratch

1. ALGORITHM

The word **Algorithm** means "a process or set of rules to be followed in problem-solving operations". Therefore, Algorithm refers to a set of rules or instructions that step-by-step define how a work is to be executed upon in-order to get the expected results.

PRACTICE PROBLEMS

1. Write a pseudo code that calculates the average of 3 numbers.
2. Write a pseudo code that display all the multiples of 5 between 1 and 100.
3. Write a pseudo code that takes number from user and checks whether the number is even or odd.

2. INTRODUCTION TO SCRATCH

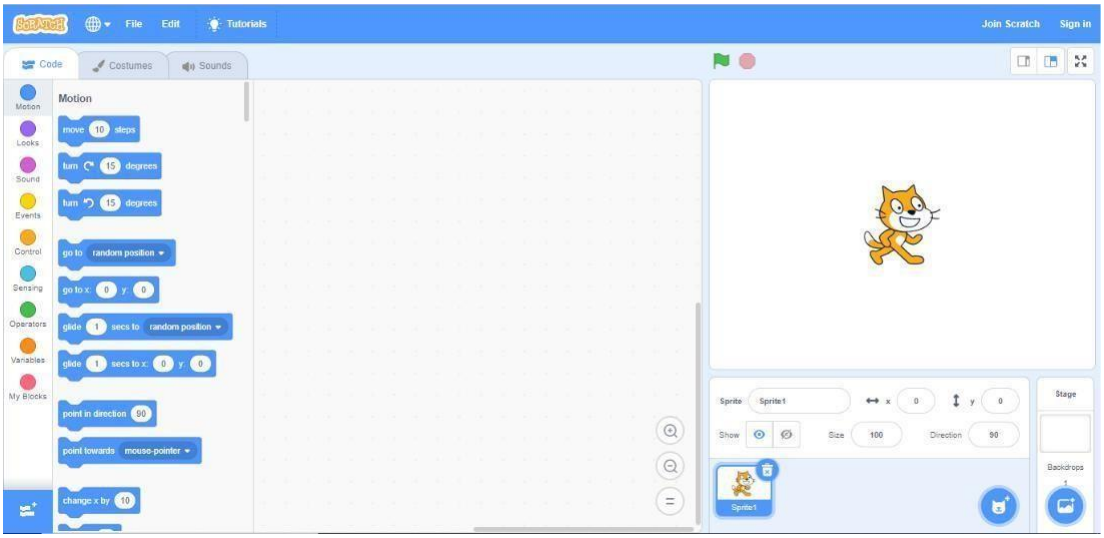
Scratch is a programming language that lets you create your stories, animations, games, music and art.

Go to the URL: **https://scratch.mit.edu/**

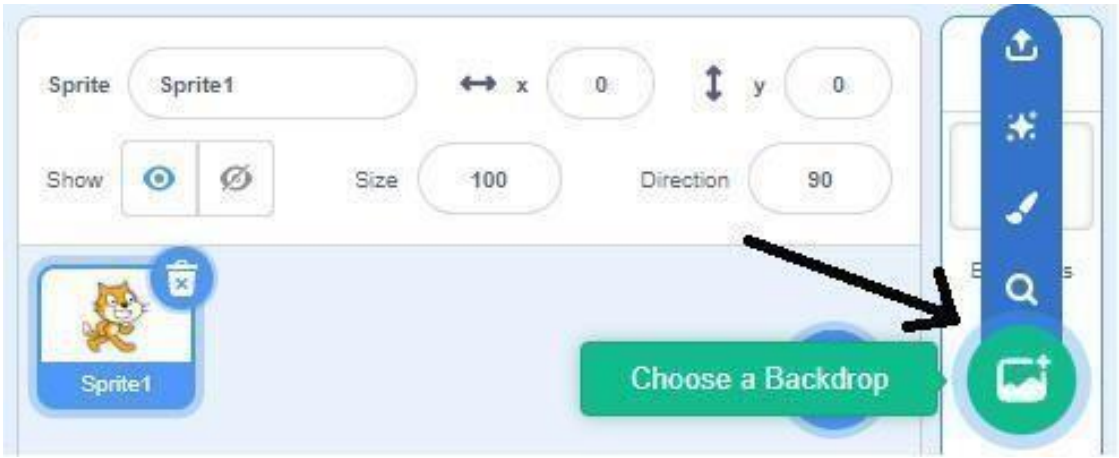
Perform the following steps

Step1: Make a new project by clicking on **Create** at top left

This would launch the following window

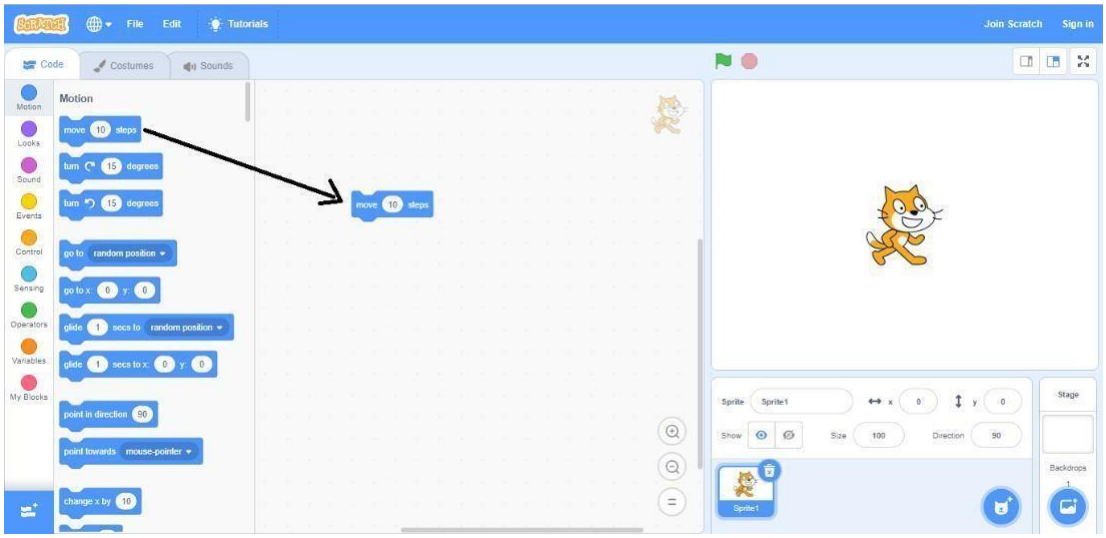


You can change the **Backdrop** from bottom right



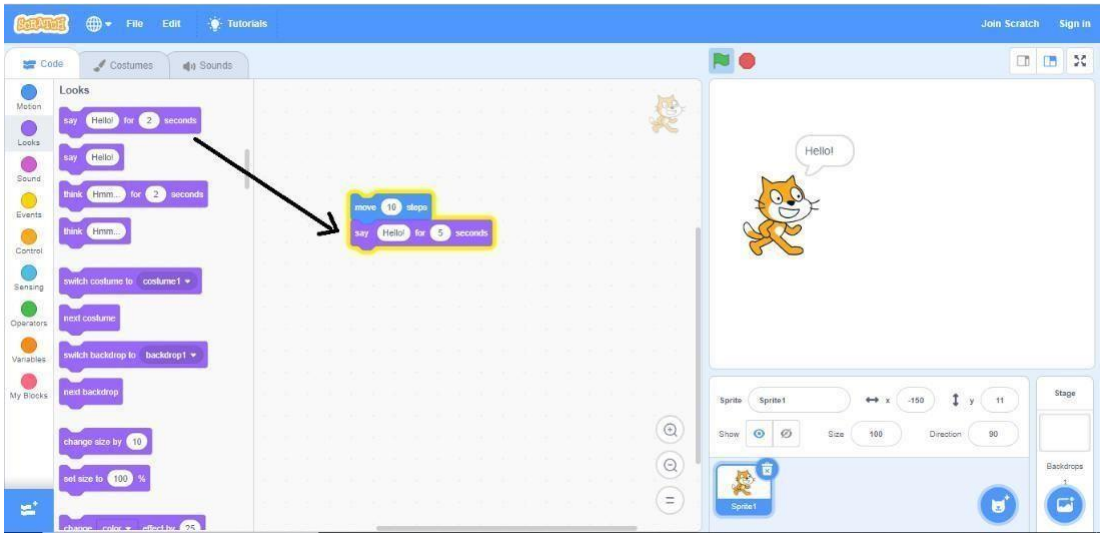
Change the character **Sprite** by clicking on cat face logo

Step2: Drag the **Move** block in script area



Step3: Click on the **Move** block to make the cat move.

Step4: Click on the **Looks**. Drag out the **Say** block and snap it on the **Move** block.

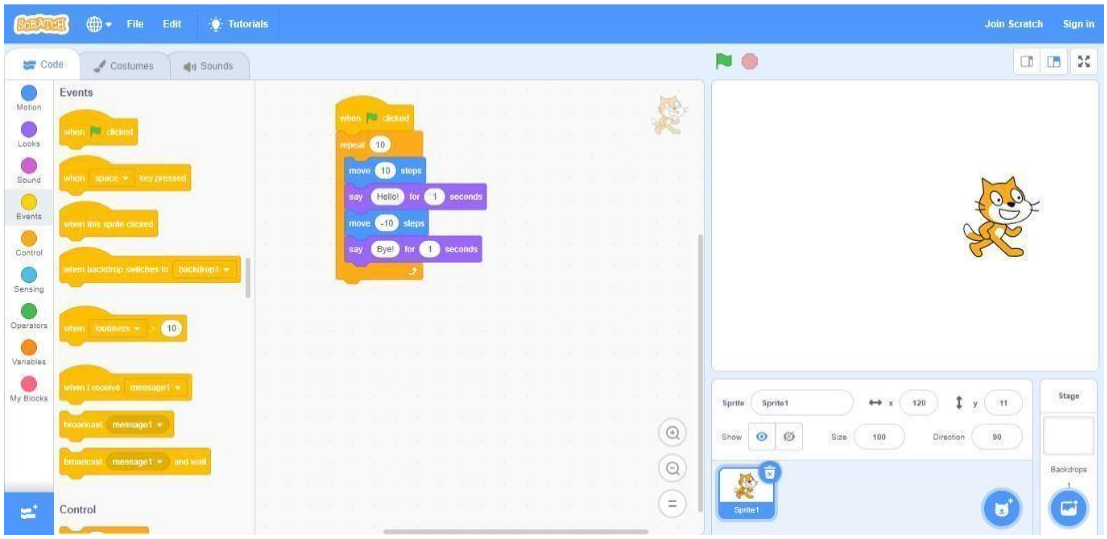


Step5: Add another **Move** block. Click inside the block and type in a **minus** sign. Add another **Say** block. Click on any of the blocks to run the stack.

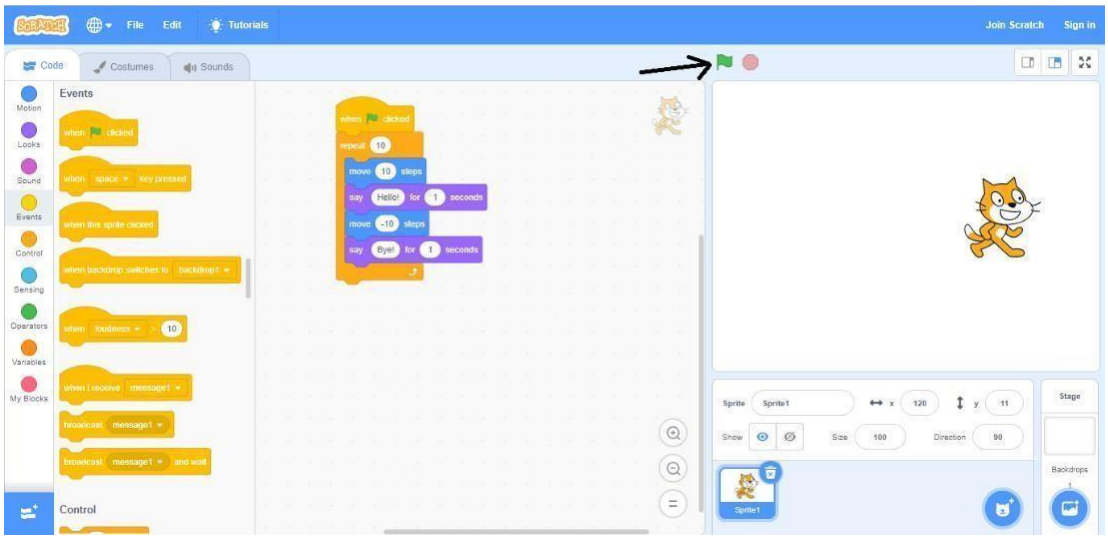
Step6: From **Controls**, drag out a **Repeat** block and drop it on top of the stack. You want the mouth of the **Repeat** to wrap around the other blocks.

You may change the number of times it repeats.

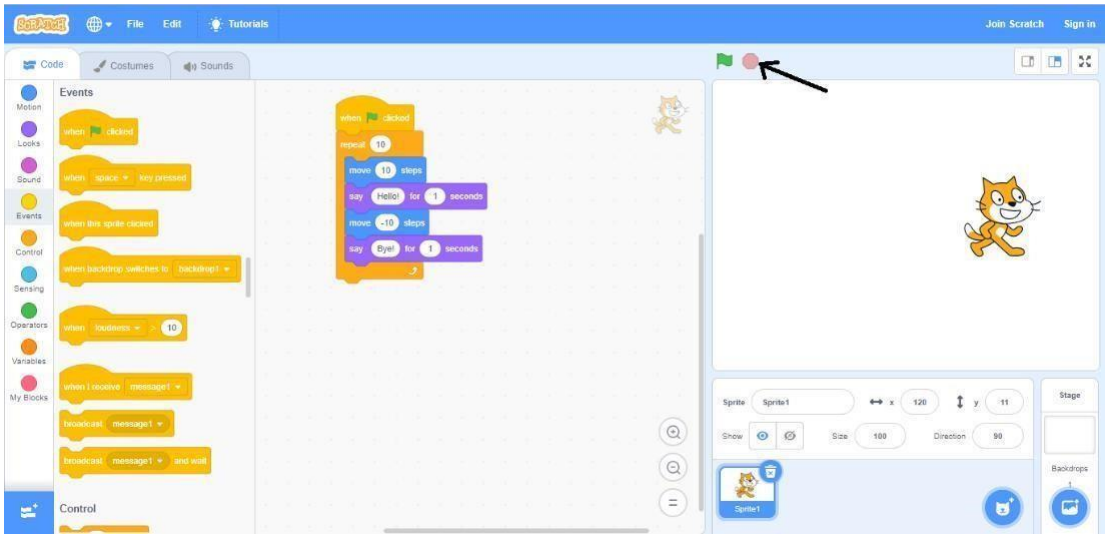
Step7: Click on **Events**, drag out a **Green Flag** block and drop it on top of the stack. Whenever you click the green flag, your script will start. To stop, click the stop button.



Click on the **Green Flag** to start the script.



Click on the **Red Button** to stop the script.



Lab Task

Create a mini game by creating a player '**sprite'** that moves with right and left keys and an '**asteroid'** sprite that clones itself every few seconds. The clone should start moving down and deletes itself when it touches the end of the screen. The game ends when the asteroid touches the player.

OR

Write a program that consists of two sprites, the first one moves randomly and the second one moves horizontally back and forth. If a collision occurs between the two sprites, the "Hit Score" value will increase by 1. If the **"Timer"** value is less than 1, the program will stop, and the second sprite will say the value of **"Hit Score**" variable.