



Department of Computer Science

CL1002-Programming Fundamentals – FALL 2023

LAB 02

Algorithms for Basic Problem Solving using Scratch



1 ALGORITHM

The word **Algorithm** means "a process or sequence 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 in-order to get the expected results.

2 PSEUDOCODE

Pseudocode is a way of expressing an algorithm using syntax that is independent of any particular programming language. The algorithm can then be coded in a suitable programming language.

Example:

Pseudocode for making a cup of tea:

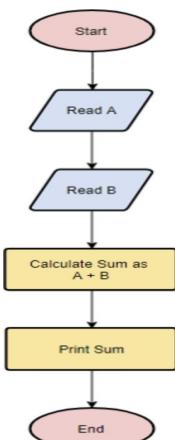
Input → Tea cup. Water. Tea bag, apparatus to boil water.

1. START
2. Fetch a tea cup
3. Boil some water
4. Place a tea bag into the cup
5. Pour on boiling water
6. Stir tea bag
7. Remove tea bag
8. END

3 FLOWCHART

Flowchart is a graphical representation of an algorithm. Programmers often use it as a program-planning tool to solve a problem. It makes use of symbols which are connected among them to indicate the flow of information and processing.

Example:

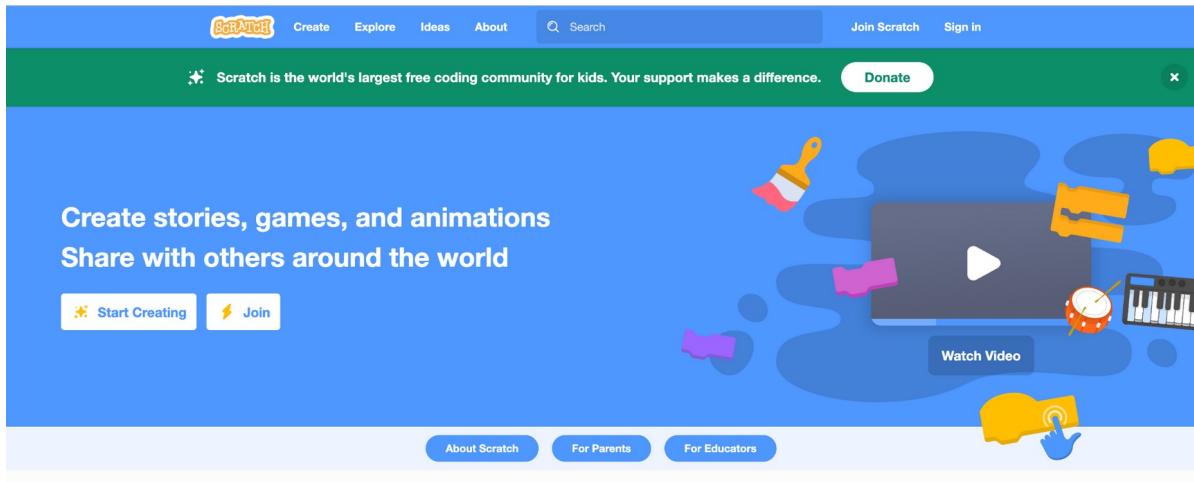


1. Write a pseudo code that calculates the average of 3 numbers. Also draw a flow chart

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/>

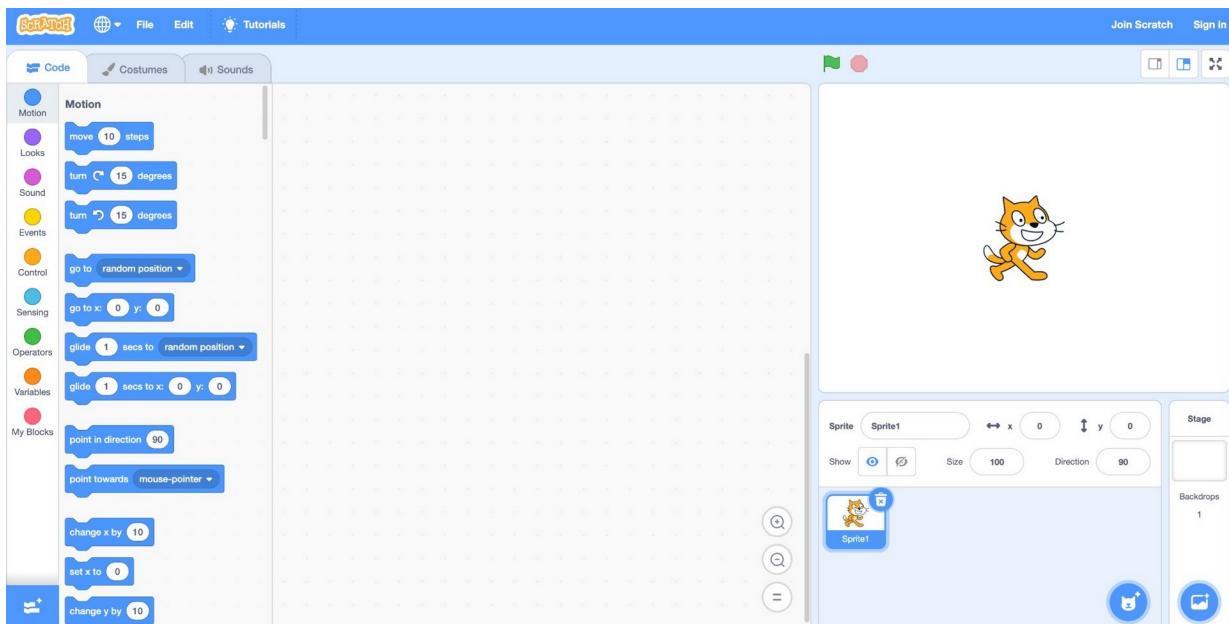


Perform the following steps

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

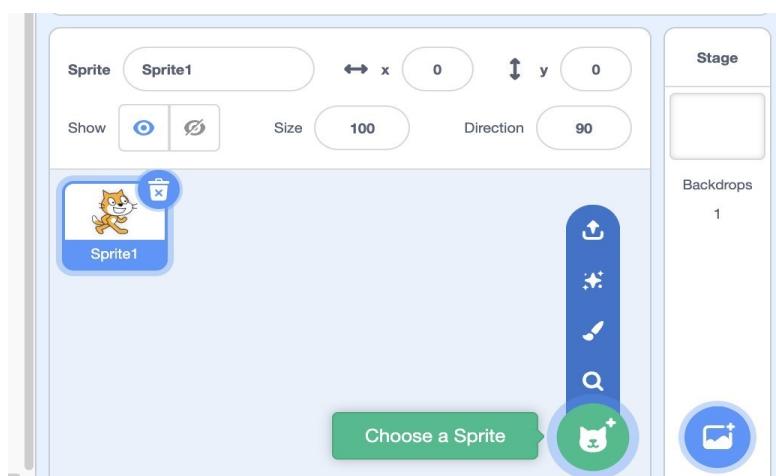
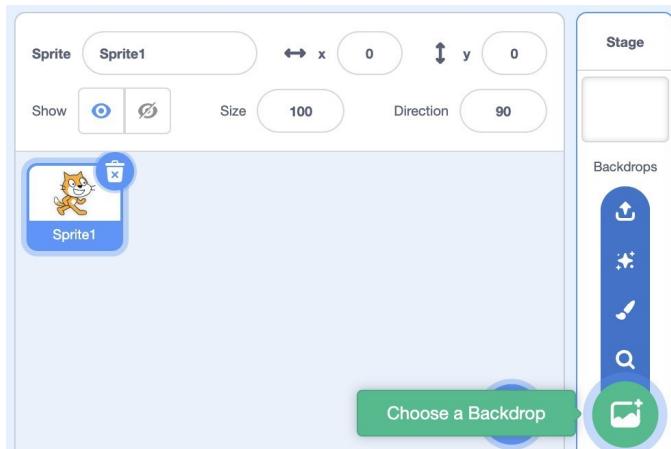


This would launch the following window

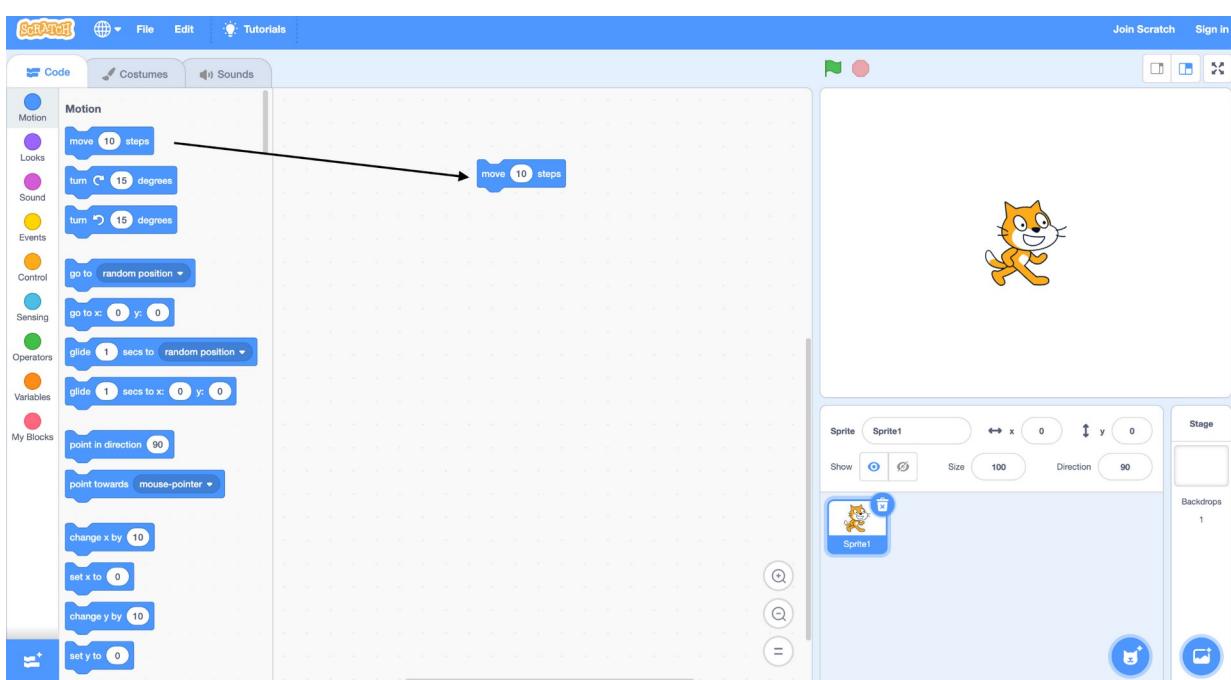


You can change the **Backdrop** from bottom right

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

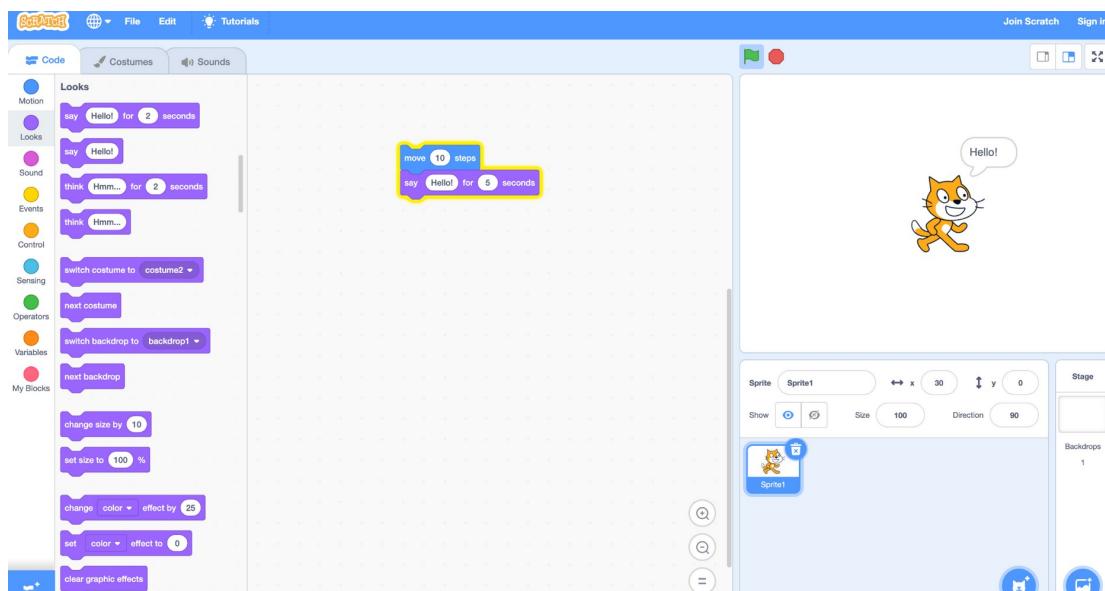


Step2: Drag the **Move** block in script area

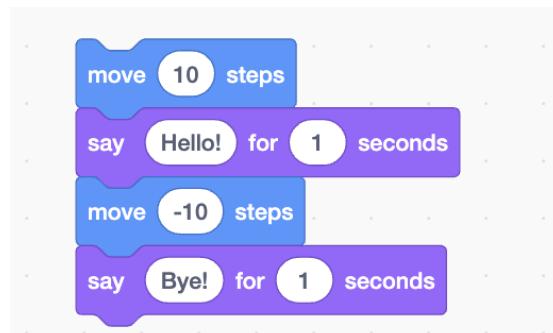


Step3: Click on the **Move** block to make the cat move.

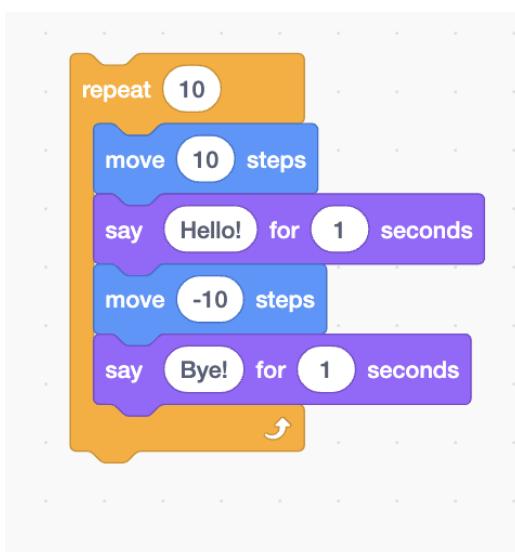
Step4: Click on the **Looks**. Drag out the **Say** block and snap it on the **Move** block.



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

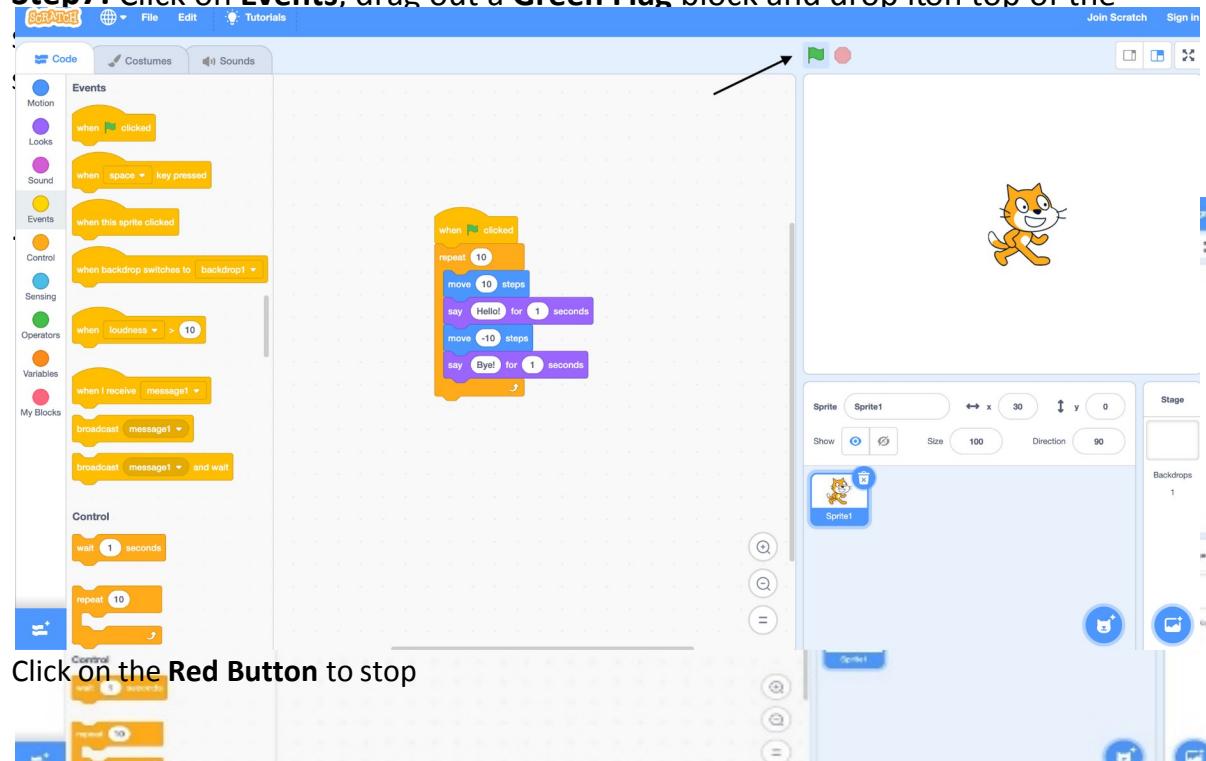


Step6: From **Controls**, drag out a **Repeat** block and drop it on top of mouth of the **Repeat** to wrap around the other blocks.

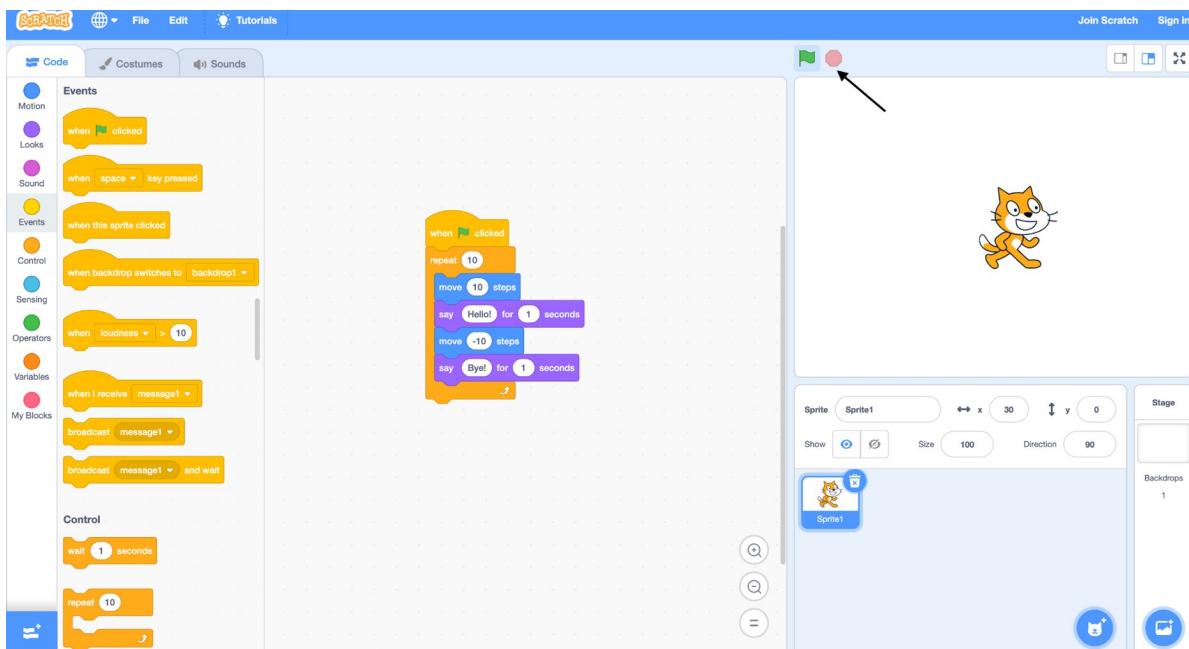


You may change the number of times it repeats.

Step7: Click on **Events**, drag out a **Green Flag** block and drop it on top of the



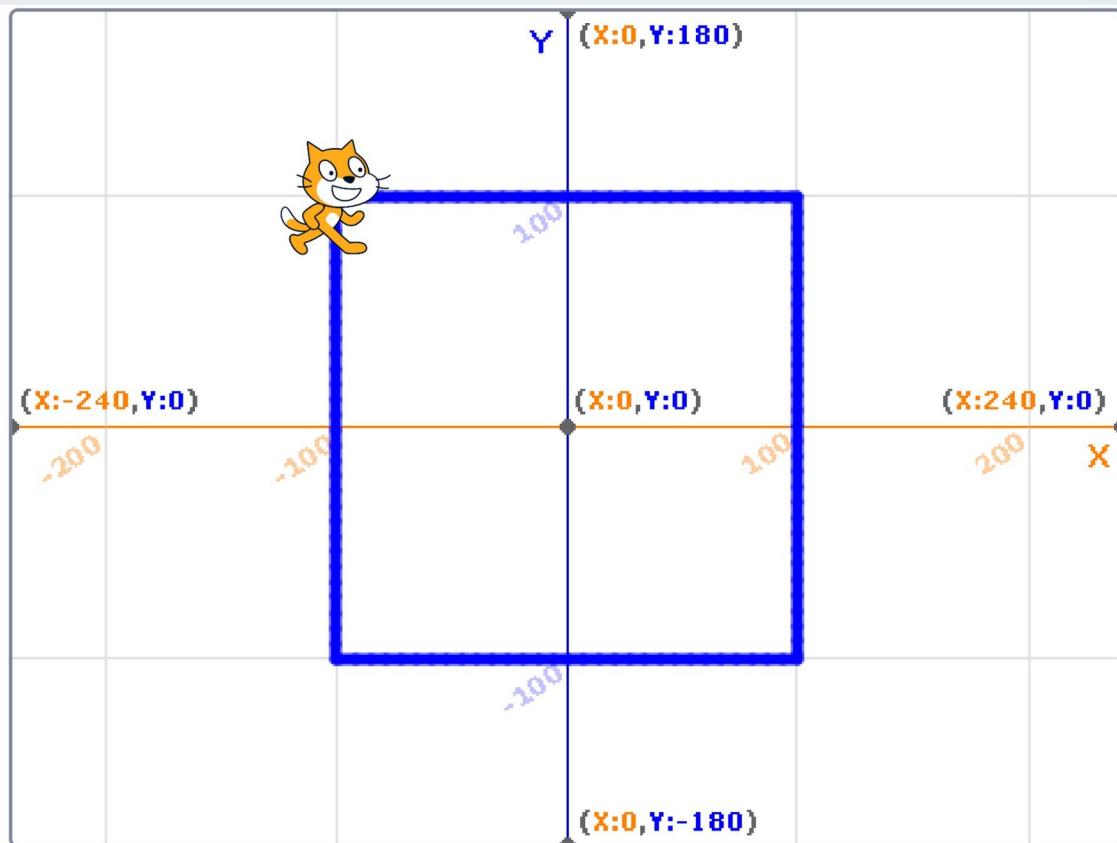
Click on the Red Button to stop



Practice

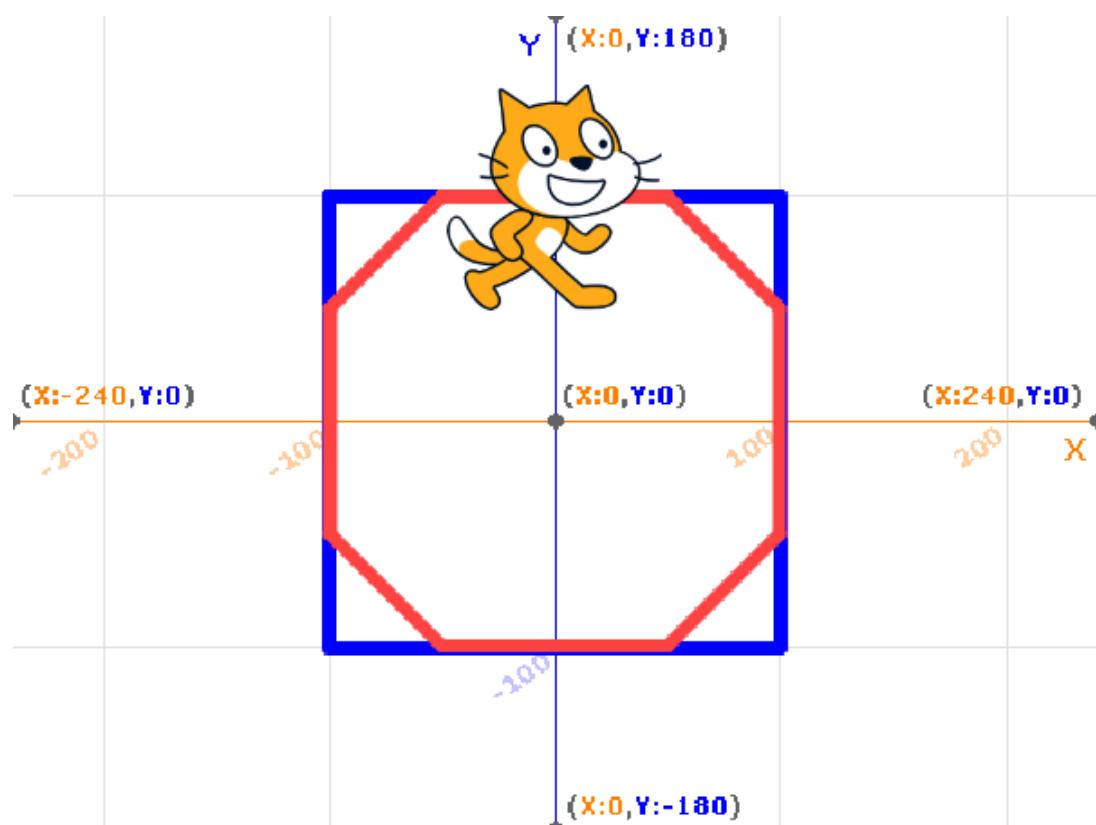
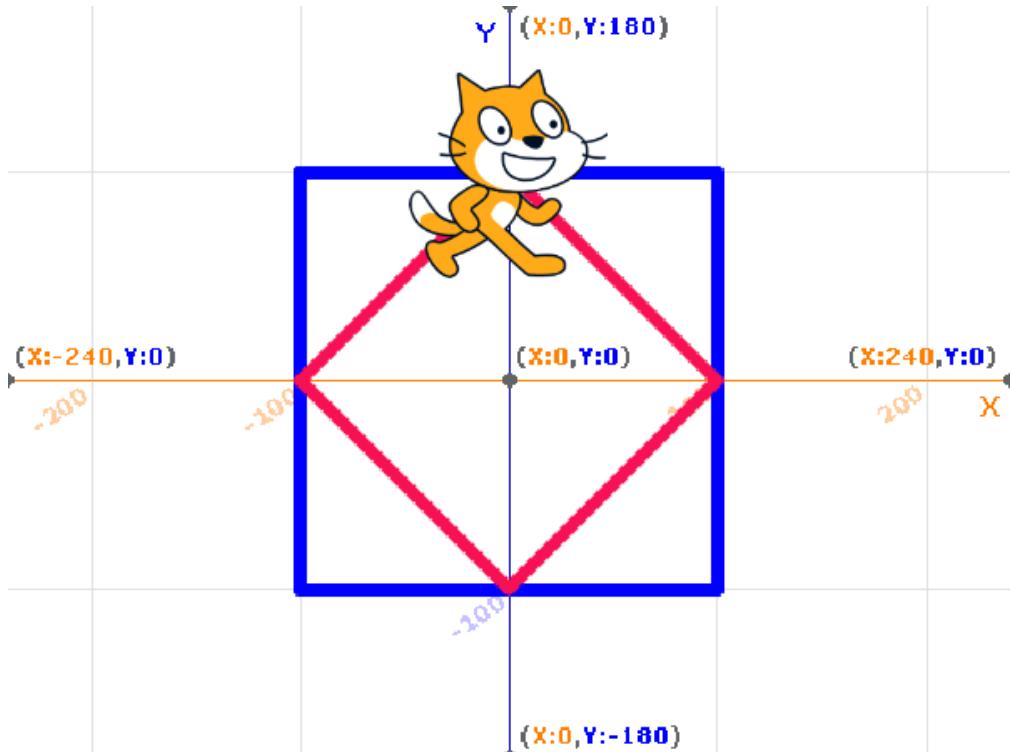
Create a program that makes your character move around and draw continuously.
You can use **pen down** block to draw something.

Reference figure is given below for your help.



Task1

Now your task is to create the following two shapes inside the **Square**. First you have to draw a square then draw the other shape, in red color, inside of it. Given below is the reference figure. (10)



Task2

Your next task is to create the reference figure given below.

(10)

