Week 1

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By the end of Week five

You should have a good understanding of

- What a program is
- Variables
- Data types
- Operators
- Conditions
- Loops
- Functions
- Arrays
- Be able to code the ‘Vigenère Cipher’

By the end of Today…

You should have a basic understanding of

- What a program is
- Input and Output
- Events in Scratch
- Actions in Scratch
- Loops in Scratch
- Conditions in Scratch
- Get a Scratch account
- Apply for a JetBrains student license

What is a Program?

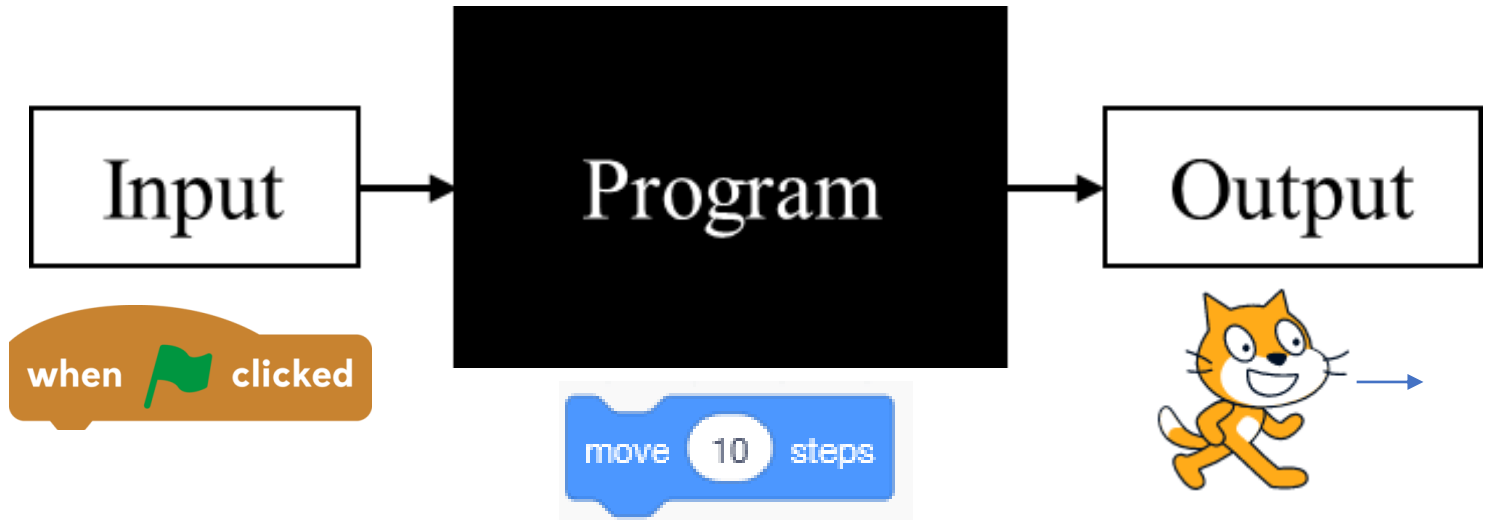
- A program is a set of steps that converts an Input to an Output.

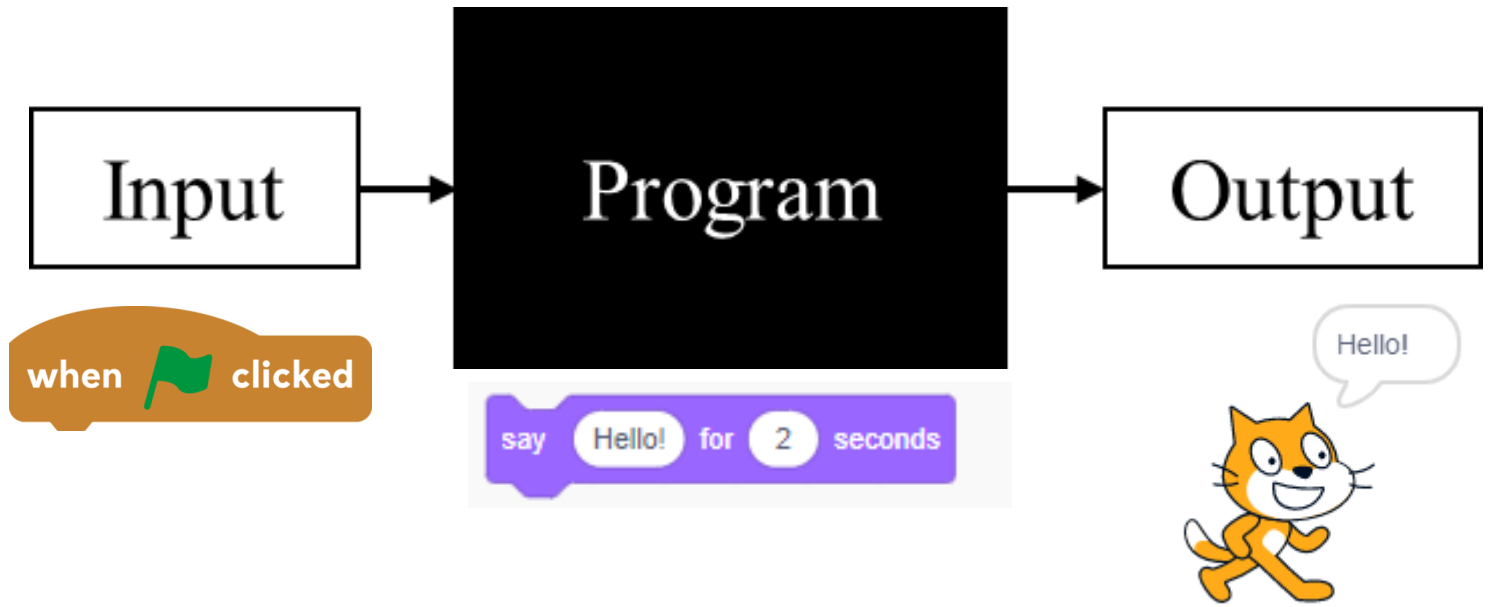
- The input is what the user passes into the program
- The output is what the user wants in return
- The black box is the program we create.

Events and Actions in Scratch

- Events = Input
- Actions = Output

- Example:
  - Every time I press the Green flag, I want the sprite to move 10 steps

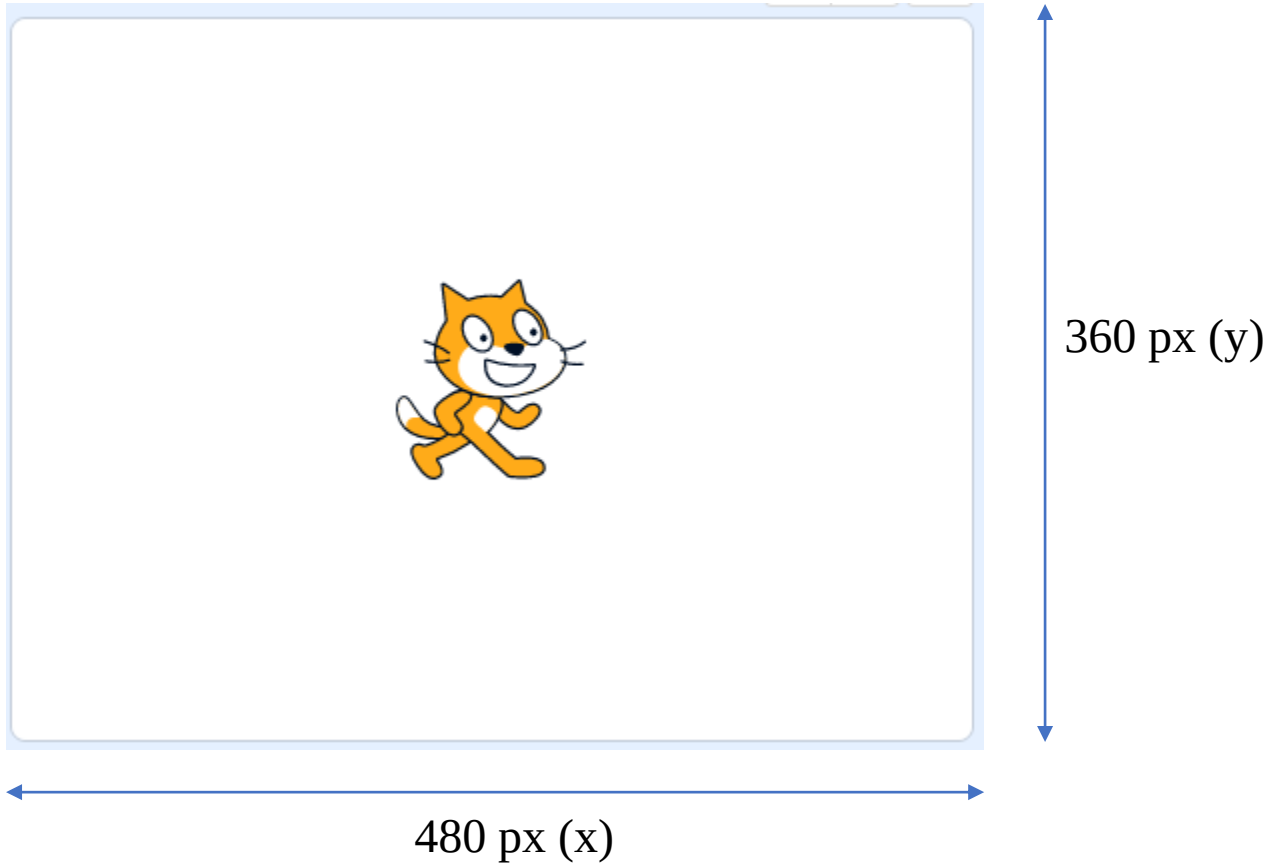

Input
Program
Output
when clicked
move 10 steps


Input
Program
Output
when clicked
say Hello! for 2 seconds
Hello!

A more complex example

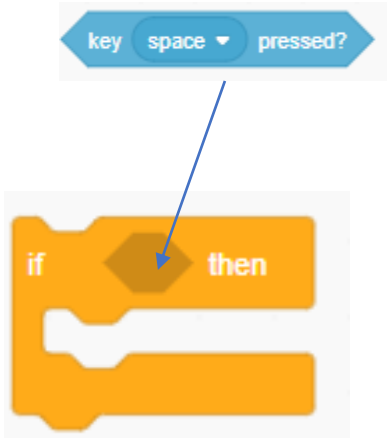
- Program’s Goal
  - Whenever I press the right arrow -> Move 10 steps to the right
  - Whenever I press the left arrow -> Move 10 steps to the left
  - Whenever I press the up arrow -> Move 10 steps up
  - Whenever I press the down arrow -> Move 10 steps down
  - Whenever I press the space bar -> play the ‘meow’ sound

The canvas



Conditions

- Bring logic into a program
- If (something happens), then do (something)
- Else: is like ‘otherwise’.

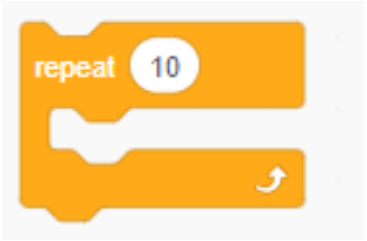


Let’s try it out

- It won’t work
  - Why? Because Programs run top to bottom only once.
  - So, the program will ignore all our requests

Loops

- To solve this, we need to use loops.
  - Loops repeat the code inside of them.
  - There are two types of loops in scratch
    - Forever Loops: Repeat forever (or until you quit the program)
    - Regular Loops: Repeat a fixed number of times or until a condition is met
    - Which one do we use here?



Continuation

- We need to use a forever loop.
  - Because we need to keep checking for the buttons to be pressed.
- We can’t use a regular loop
  - Because each run of the loop happens incredibly quickly, so there will not be any use.

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