# Introduction to Scratch

## Problem solving and Scratch

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# Topics list

- Problem Solving
- Scratch: Offline Editor and Online Editor
- Flow of Control in a Program
- SomethingFishy Examples:
  - Example1: Sequence
  - Example2: Sequence, Selection and Iteration.
  - Example3: Sequence, Selection and Iteration.

# Problem Solving

- Programming IS problem solving.
- We will learn about problem solving BEFORE learning how to write Java code!
- You should ALWAYS think about how you are going to solve the programming problem BEFORE jumping in and starting to code.
- For this reason, we are going to start the module by using Scratch.

# Scratch

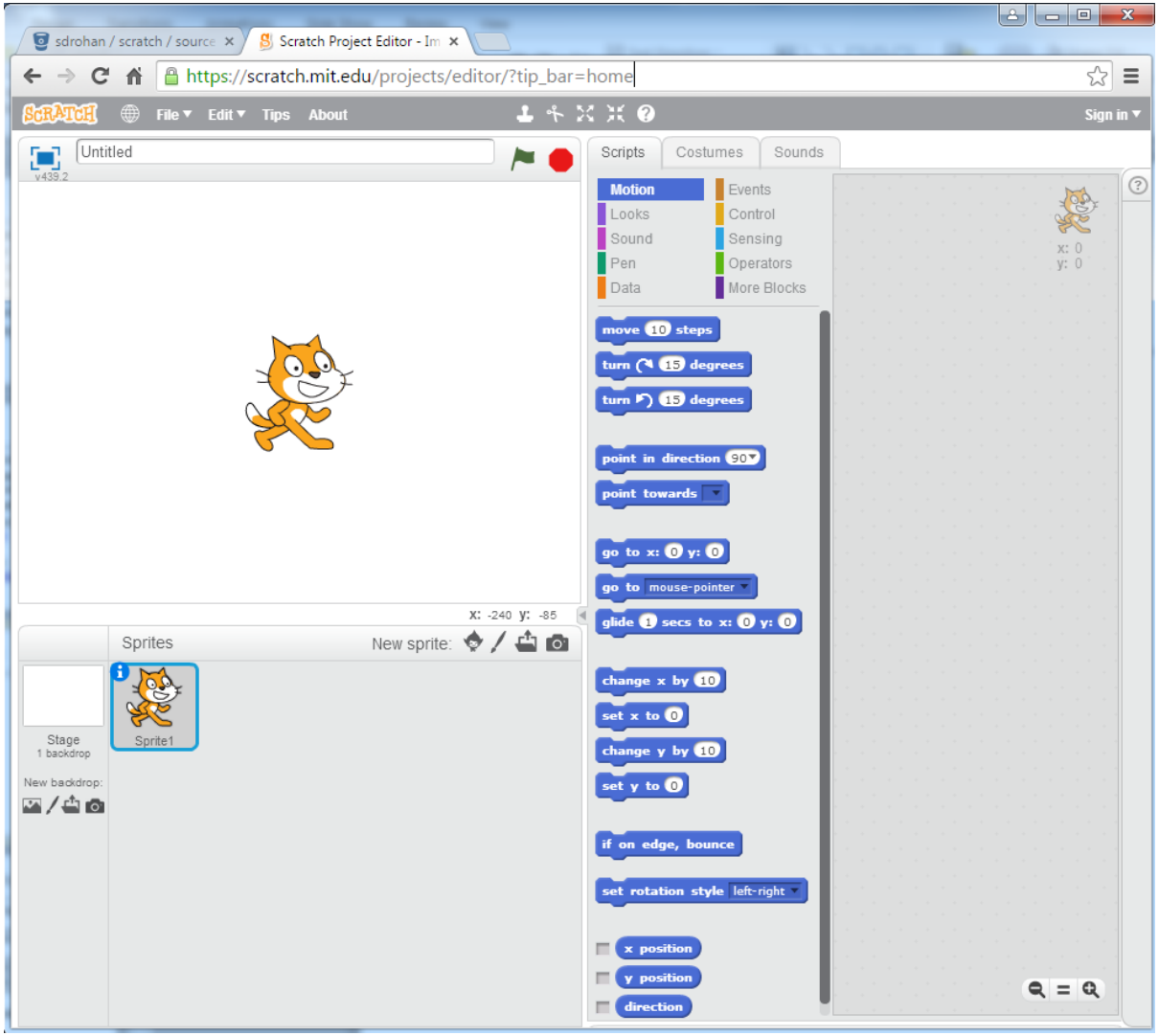
- Scratch is a graphical programming language.
- It was developed to help students to understand programming fundamentals and concepts.
- You write code in a Scratch editor.
- You can download the Offline Editor: https://scratch.mit.edu/scratch_1.4/

  Or

- You can use the online editor: https://scratch.mit.edu/projects/editor/?tip_bar=home

# Scratch Online Editor

Demo



# Flow of Control in a Program

- Each program you write will typically have:

| | |
|---|---|
| **Sequence** | Things that will be done in a particular order |
| **Selection** | Things that will be done conditionally |
| **Iteration** | Things that will be done repetitively |

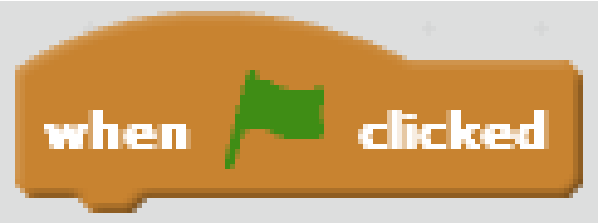
- By using examples, we will explore what each of these mean.

Vickers (2008)

# Example 1

Demonstrating SEQUENCE

# Events

| | |
|---|---|
| Runs the program when the green flag is clicked |  |

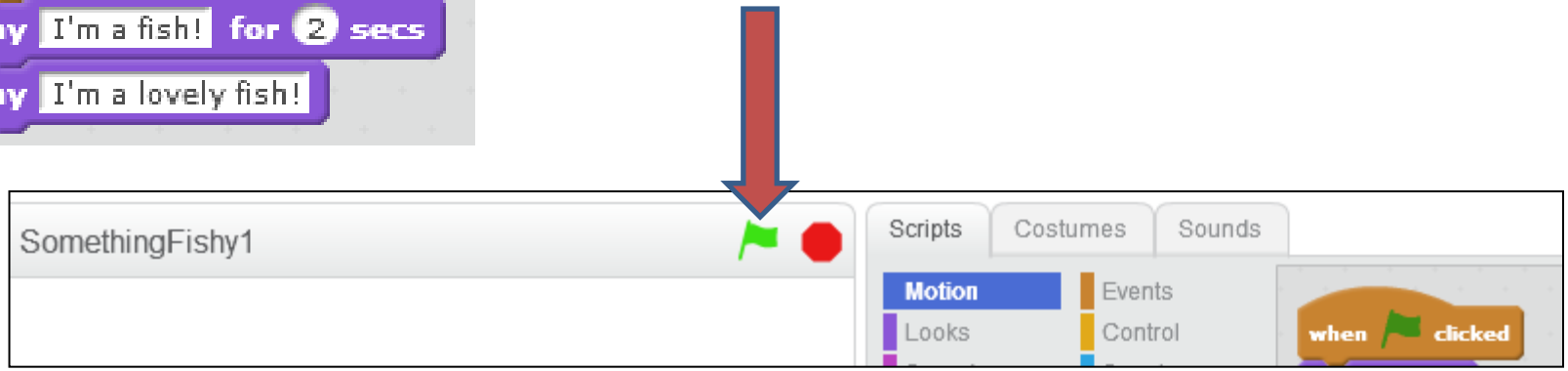
Source: Scratch help contents

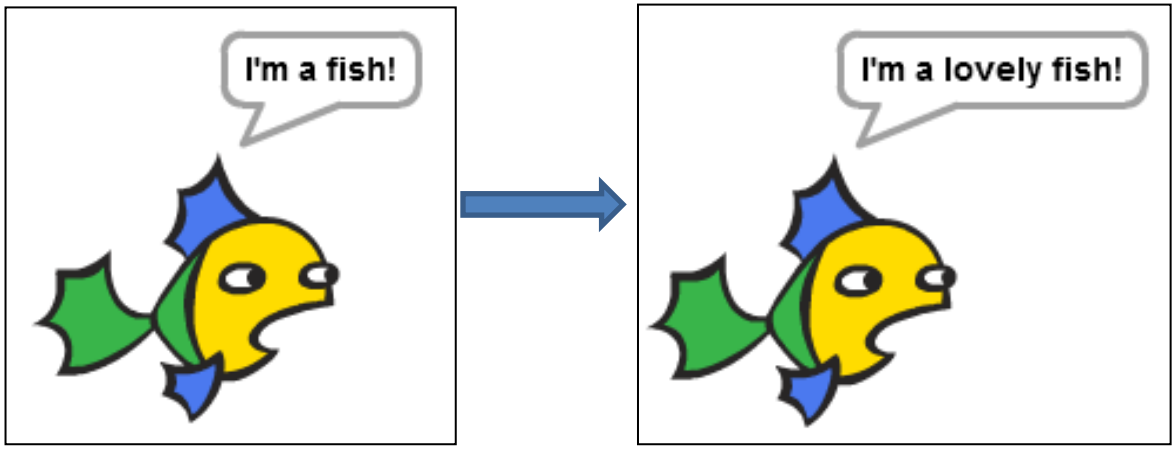
# Statements

| | |
|---|---|
| You can type in any text. The words will appear in a speech bubble for the sprite. |  |
| You can type in any words to say. The number of seconds tells the speech bubble how long to show. The program waits that long before continuing. |  |

Source: Scratch help contents

# SomethingFishy1

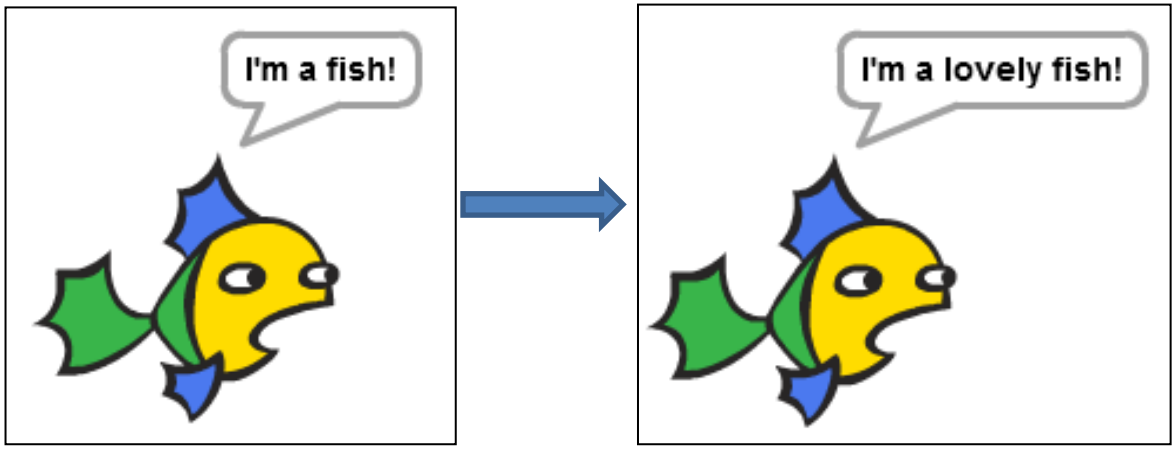
# SomethingFishy1


This example demonstrates

**SEQUENCE**

in a program.

The statements are executed in sequential order.



# Example 2

Demonstrating

SEQUENCE, SELECTION and ITERATION

# Selection / Conditions

| | |
|---|---|
| If condition is true, runs the statements inside it. |  |
| If condition is true, runs the statements inside the **if** portion; if not, runs the statements inside the **else** portion. |  |

Source: Scratch help contents

# Example of a condition

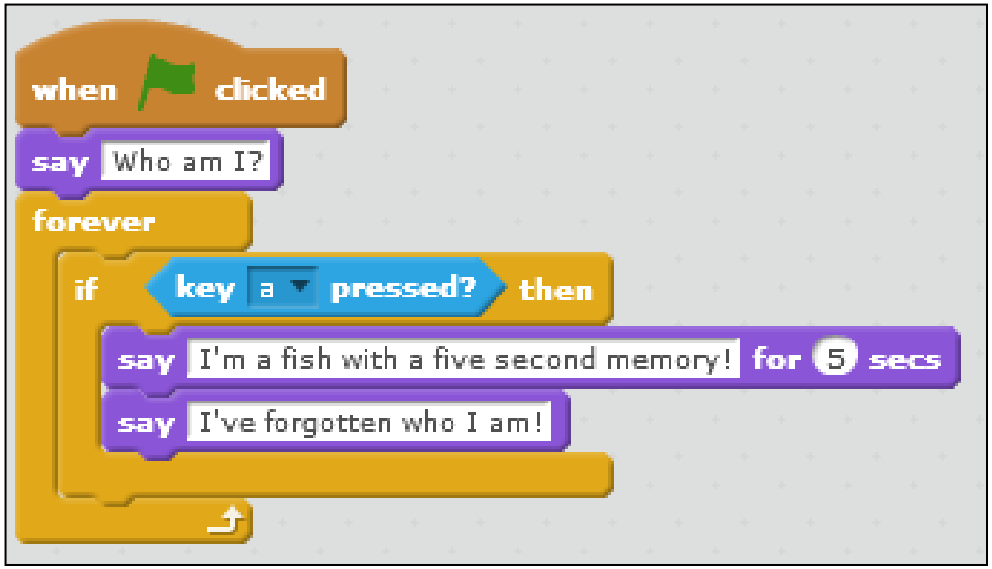
| | |
|---|---|
| Reports true if specified key is pressed. |   |

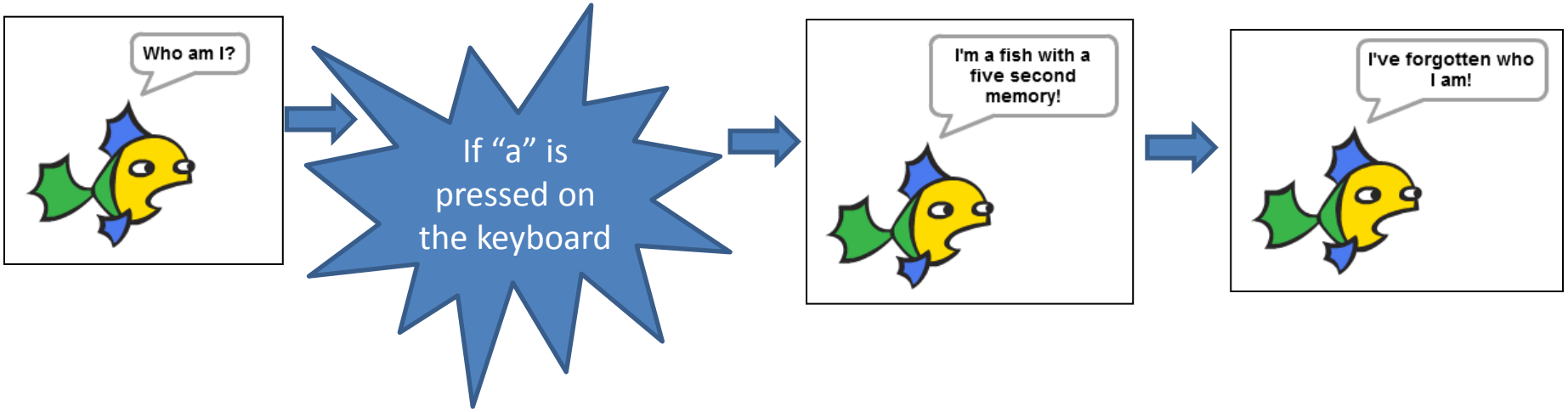
# Iteration / Loops

| | |
|---|---|
| Runs the statements inside over and over again |   |

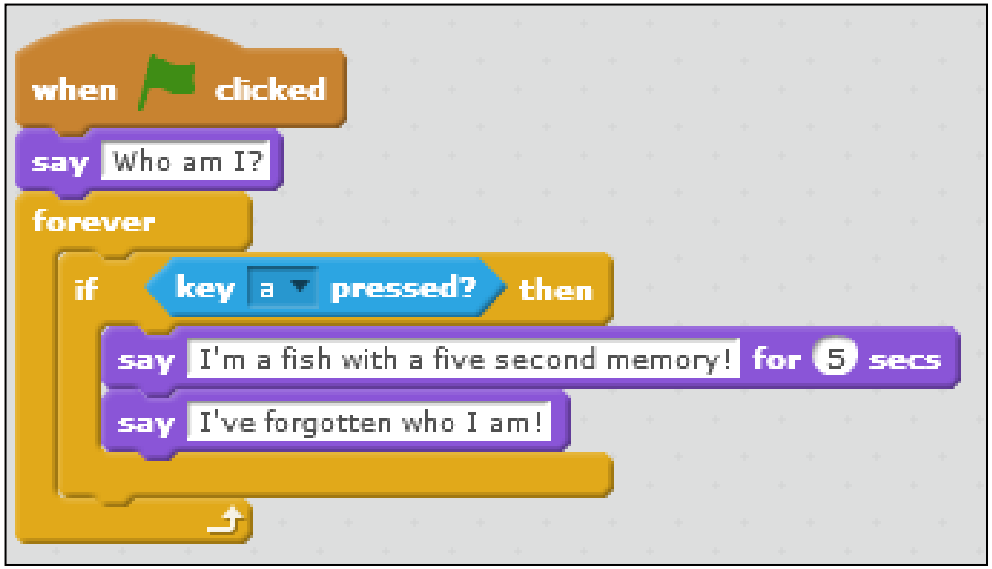
Source: Scratch help contents

# SomethingFishy2



# SomethingFishy2




<u>This example demonstrates:</u>

**SEQUENCE** (The statements are executed in sequential order)
**SELECTION** (if “a” is pressed on the keyboard, the messages are printed to the speech bubbles. If “a” is not pressed, nothing happens)
**ITERATION** (The program is continually listening/waiting for the “a” key to be pressed).

# Example 3

More on

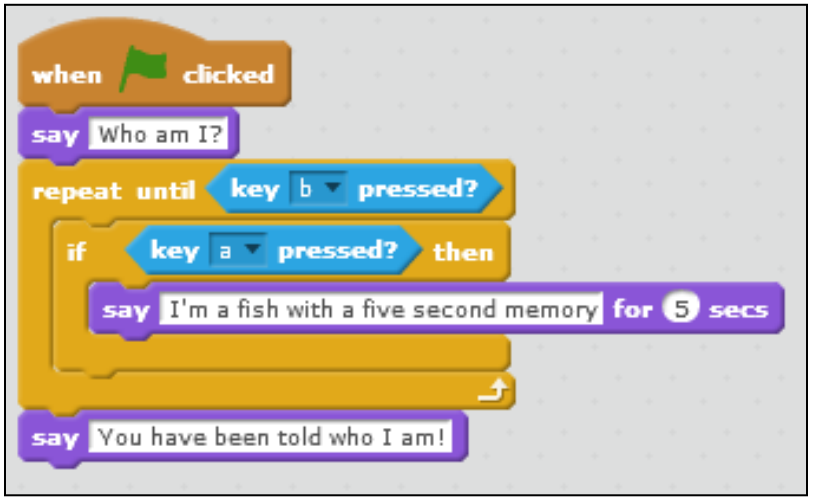
SEQUENCE, SELECTION and ITERATION

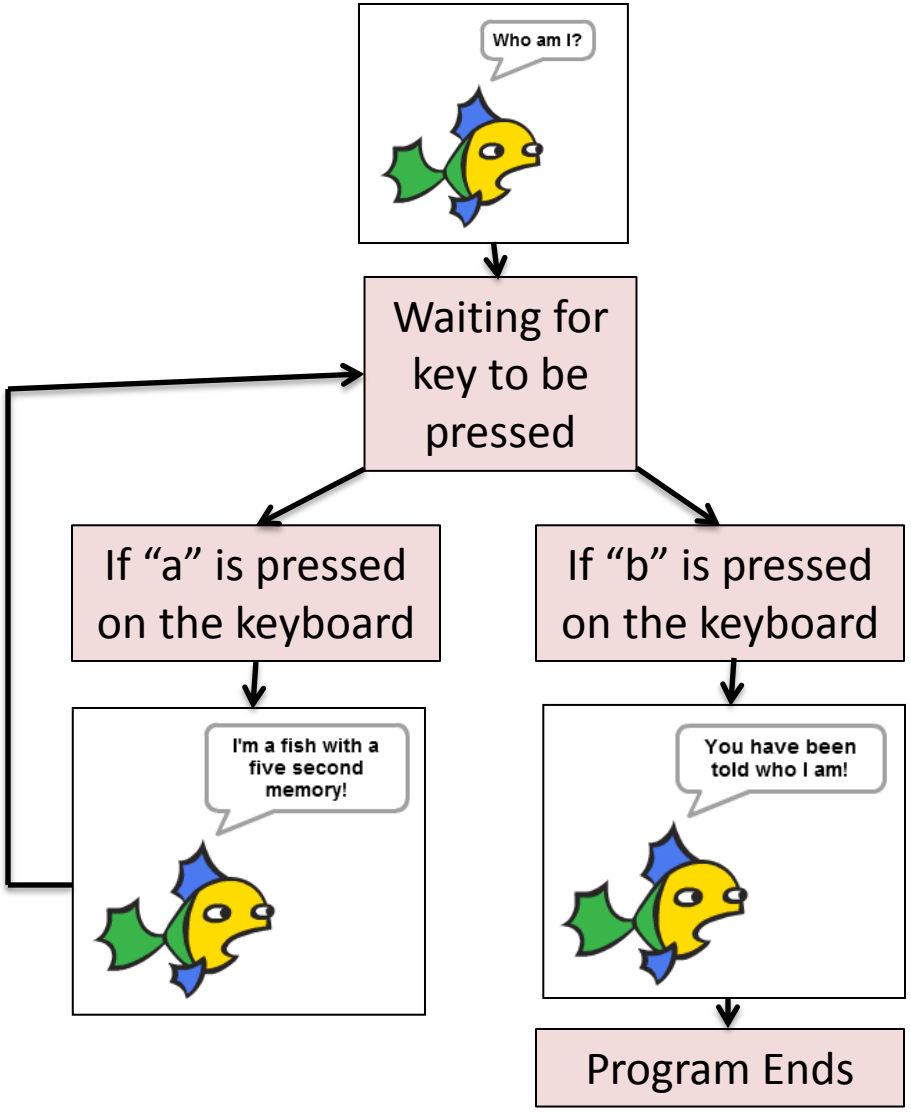
# More Control / Loops

| | |
|---|---|
| We saw this one in an earlier slide…it runs the statements inside over and over. |  |
| Repeat the statements inside until condition is true.<br><br>Checks to see if condition is false:<br>• if so, runs the statements inside and checks condition again.<br>• If condition is true, goes on to the statements that follow. |  |

Source: Scratch help contents

# SomethingFishy3



# Questions?

# References


- Vickers, P. (2008) *How to Think Like a Programmer: Problem Solving for the Bewildered*, Cengage Learning EMEA.

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