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

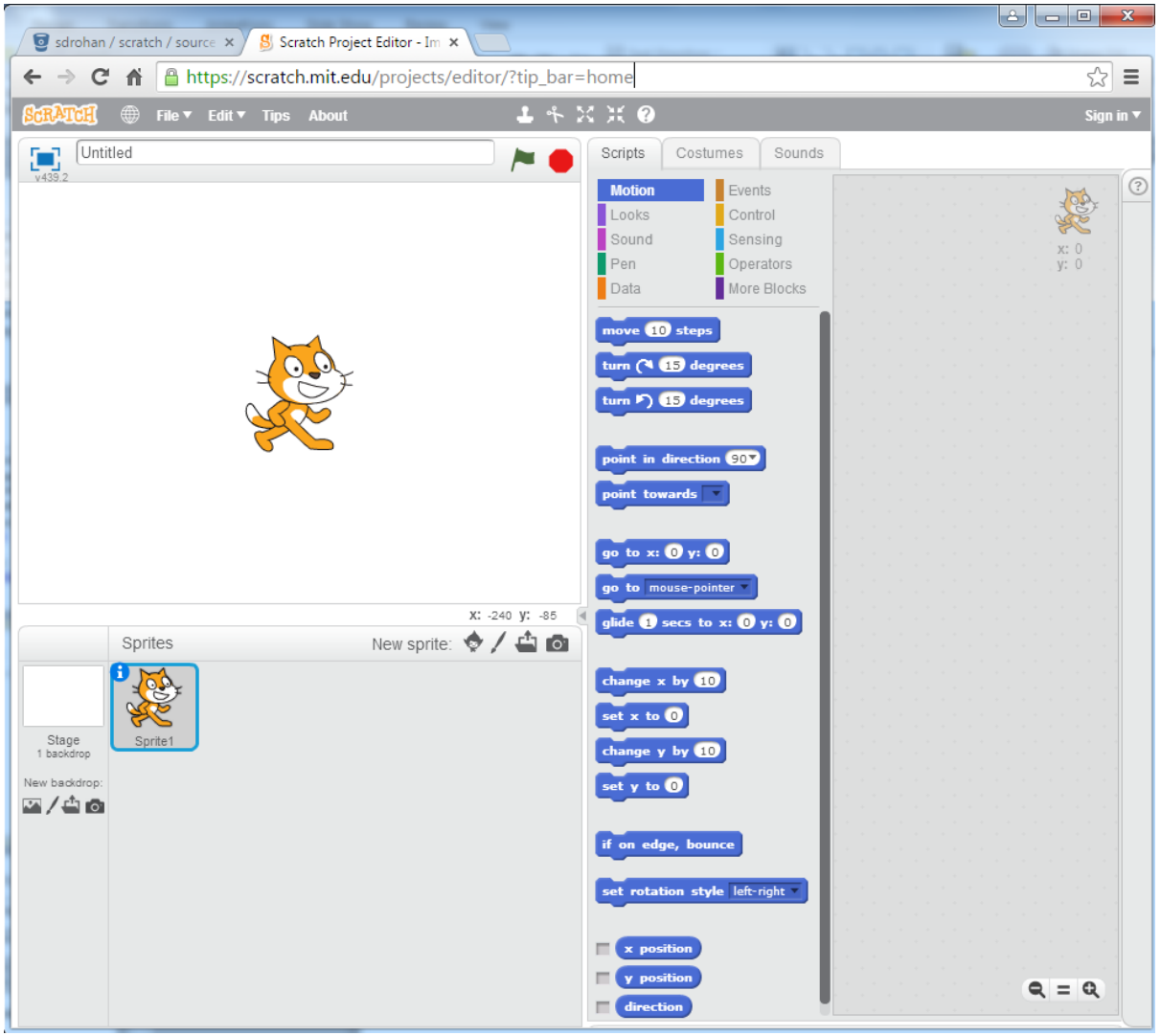
- Scratch is a graphical programming language.
- It was developed to help students to understand programming fundamentals and concepts.
- You write code in a Scratch editor.
- You can download the Offline Editor: https://scratch.mit.edu/scratch_1.4/

  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

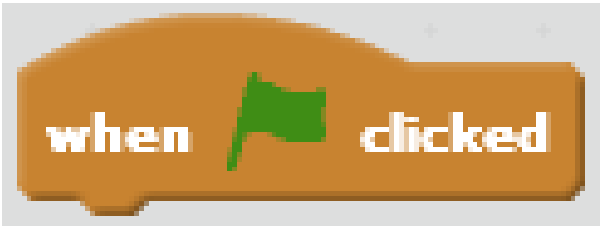
- By using examples, we will explore what each of these mean.

Vickers (2008)

Example 1

Demonstrating SEQUENCE

Events

Runs the program when the green flag is clicked	

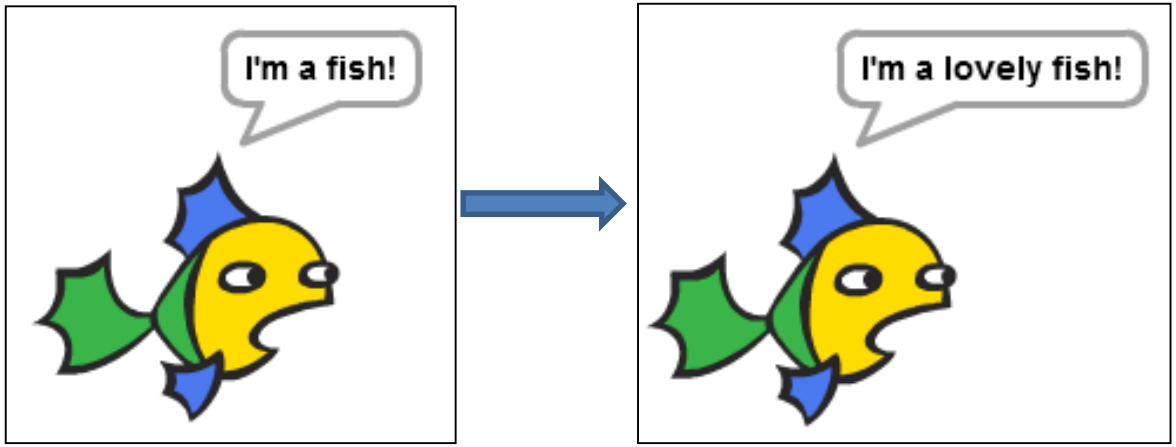
Source: Scratch help contents

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



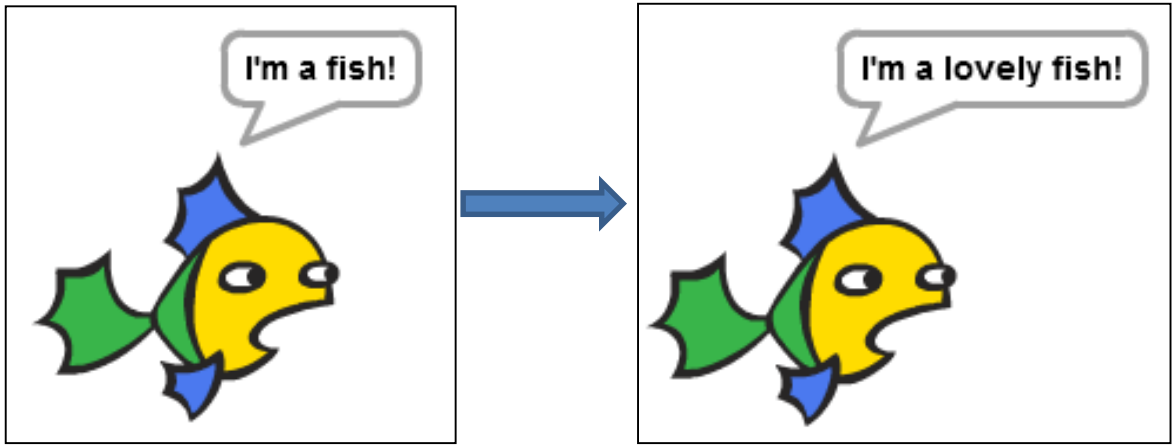
SomethingFishy1

This example demonstrates

SEQUENCE

in a program.

The statements are executed in sequential order.

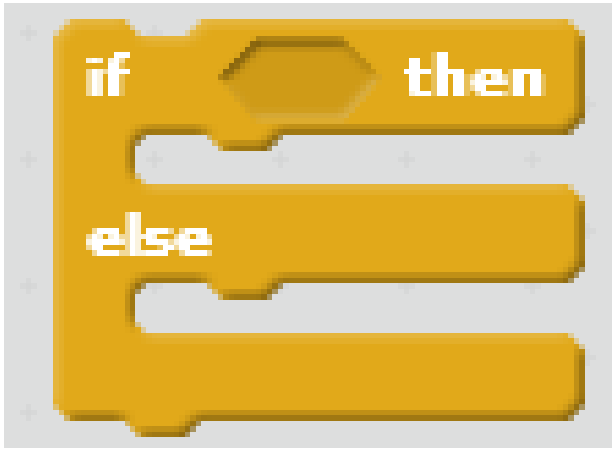


Example 2

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

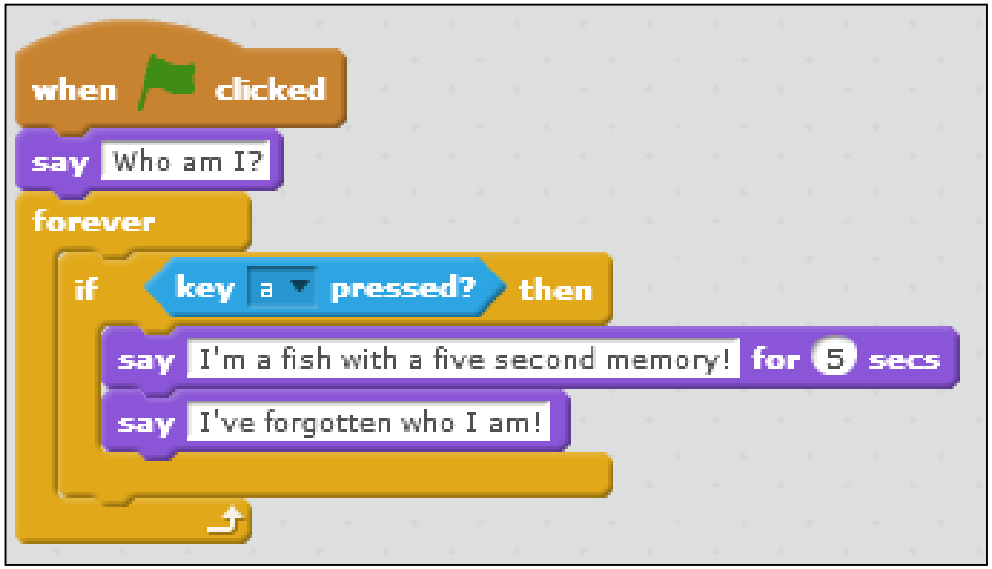
Reports true if specified key is pressed.	

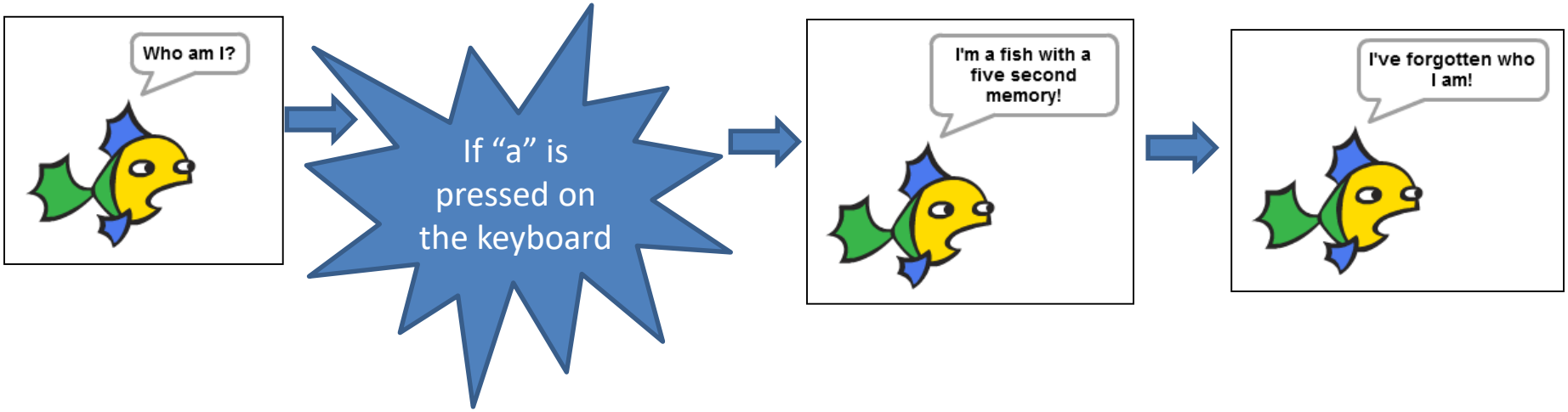
Iteration / Loops

Runs the statements inside over and over again	

Source: Scratch help contents

SomethingFishy2





SomethingFishy2

This example demonstrates:

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

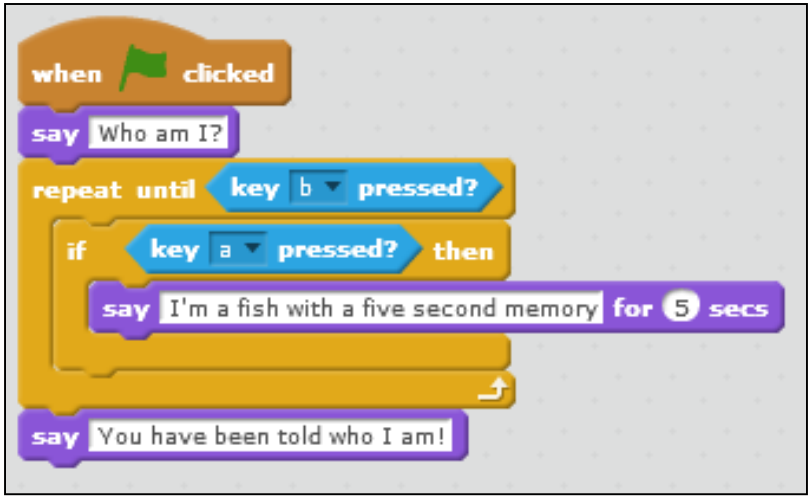
SEQUENCE, SELECTION and ITERATION

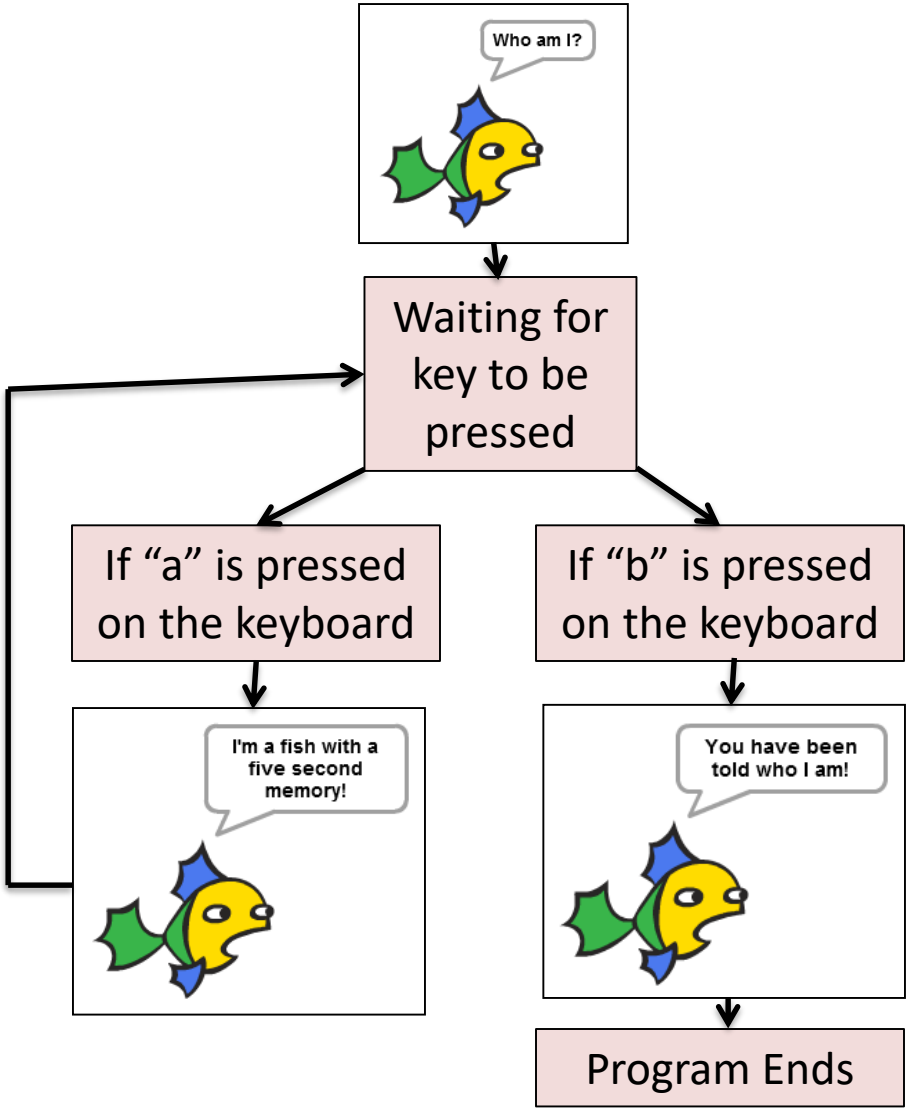
More Control / Loops

We saw this one in an earlier slide…it runs the statements inside over and over.	
Repeat the statements inside until condition is true. Checks to see if condition is false: • if so, runs the statements inside and checks condition again. • 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.