953103 Programming Logic Thinking

AppInventor

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App Inventor: Introduction

- Tool to develop android application without understand source code
- Develop by MIT
- Web-Based Application
  - Use the Web Browser to develop the application
  - Just need the proper environment
- Drag-and-drop
  - Block style

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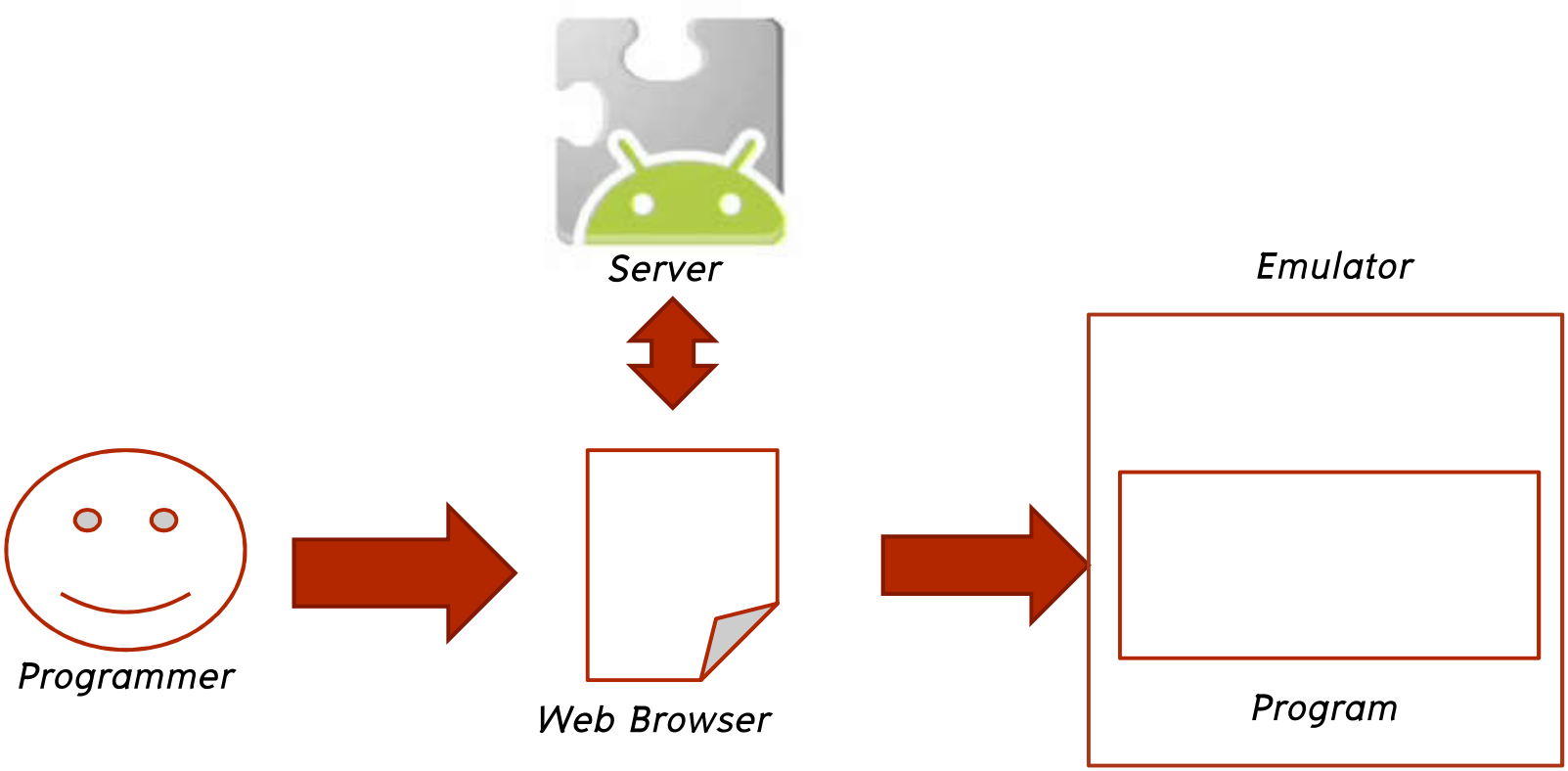
App Inventor: architecture



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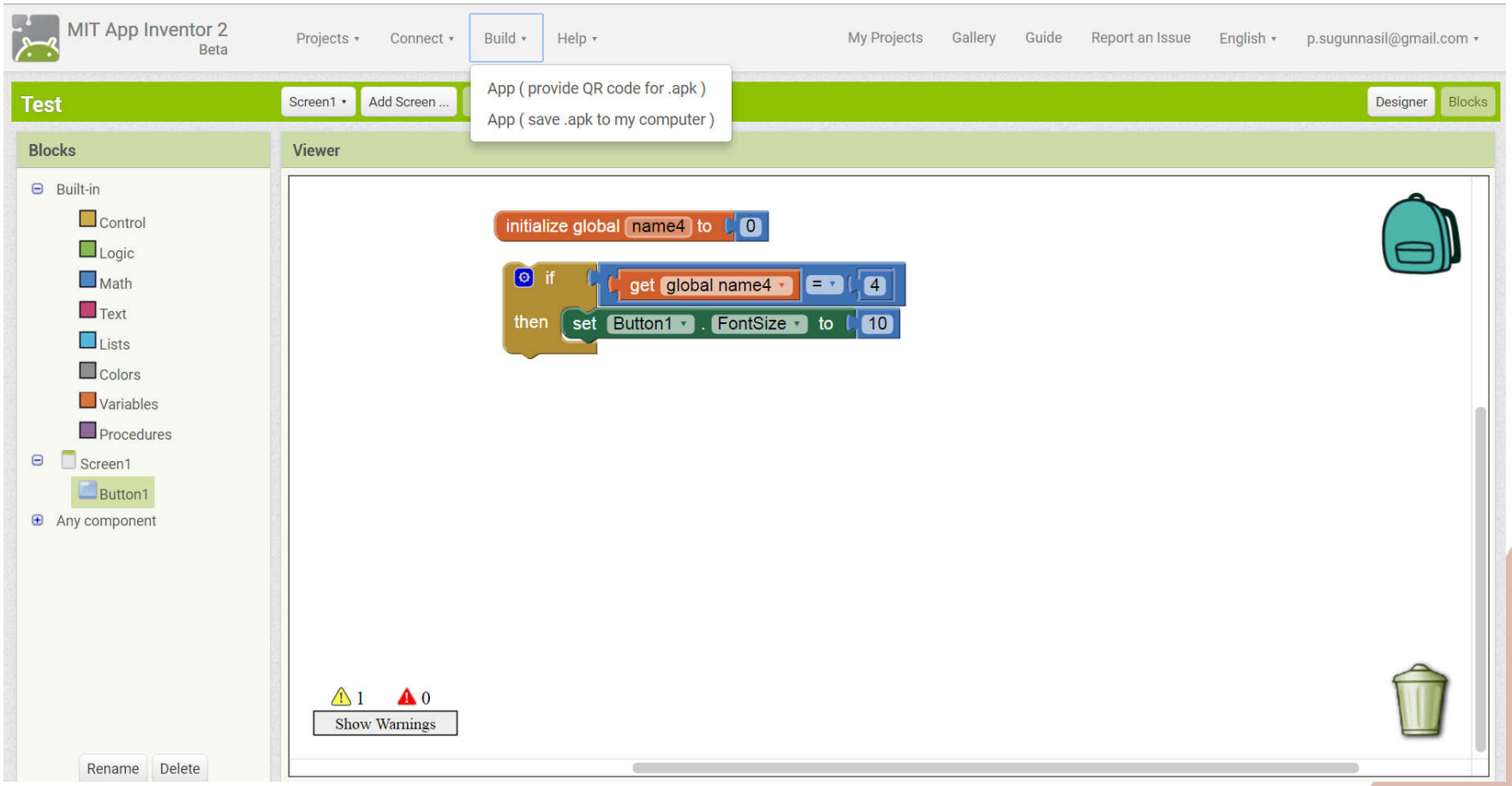
App Inventor



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App Inventor: Overall concept

EVENT–DRIVEN DEVELOPMENT

- The operation takes place when the event occurs.

- Click, Right click, roll over, etc

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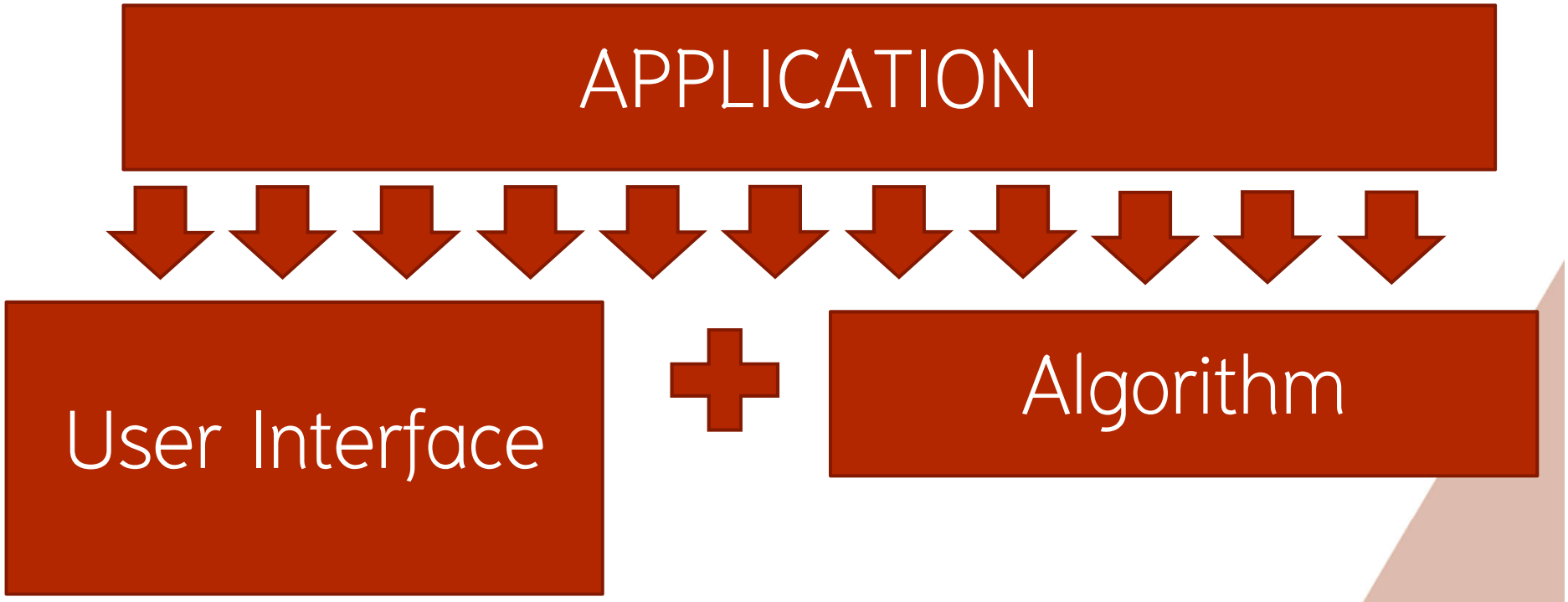
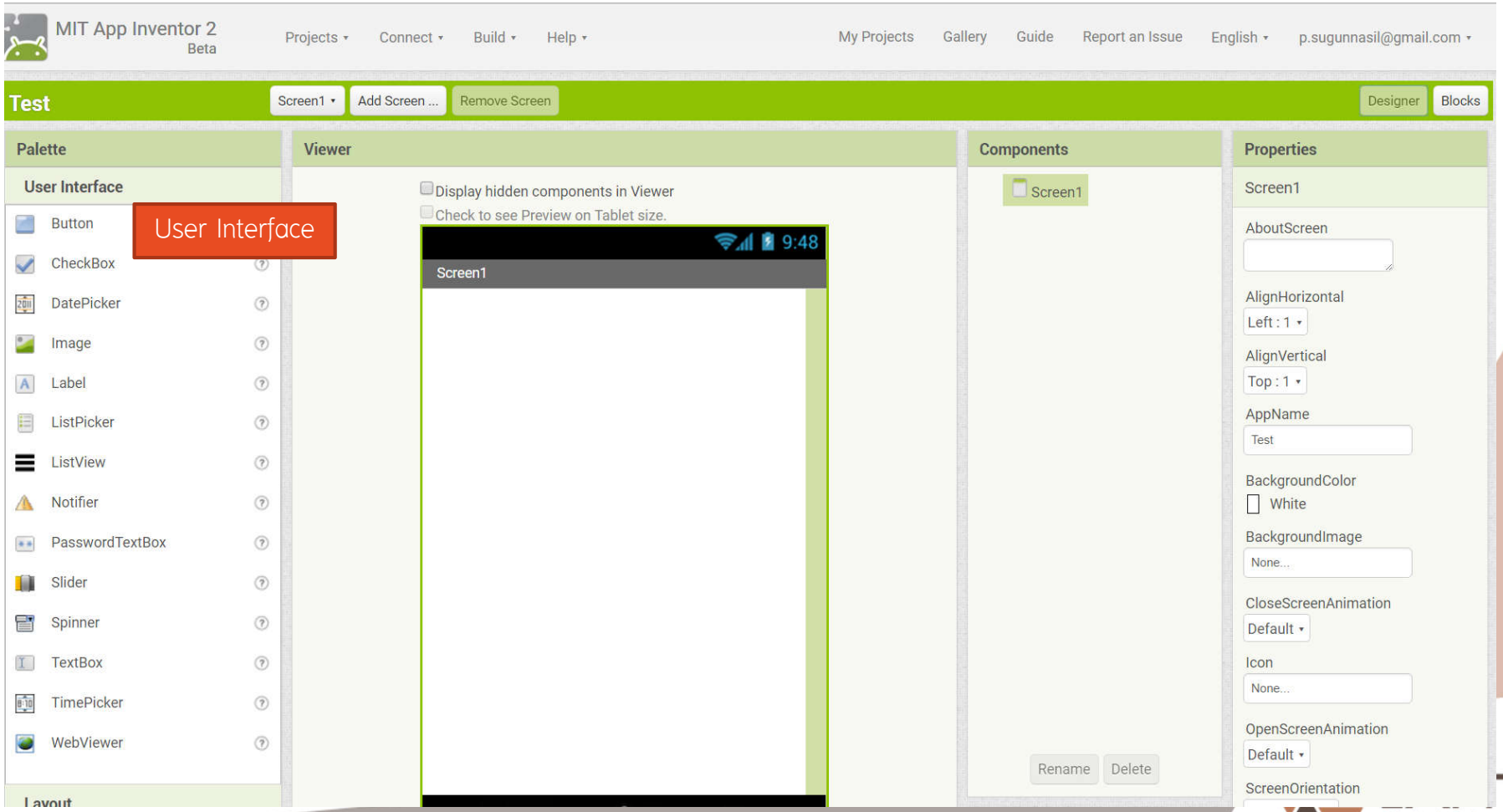
App Inventor: Overall concept



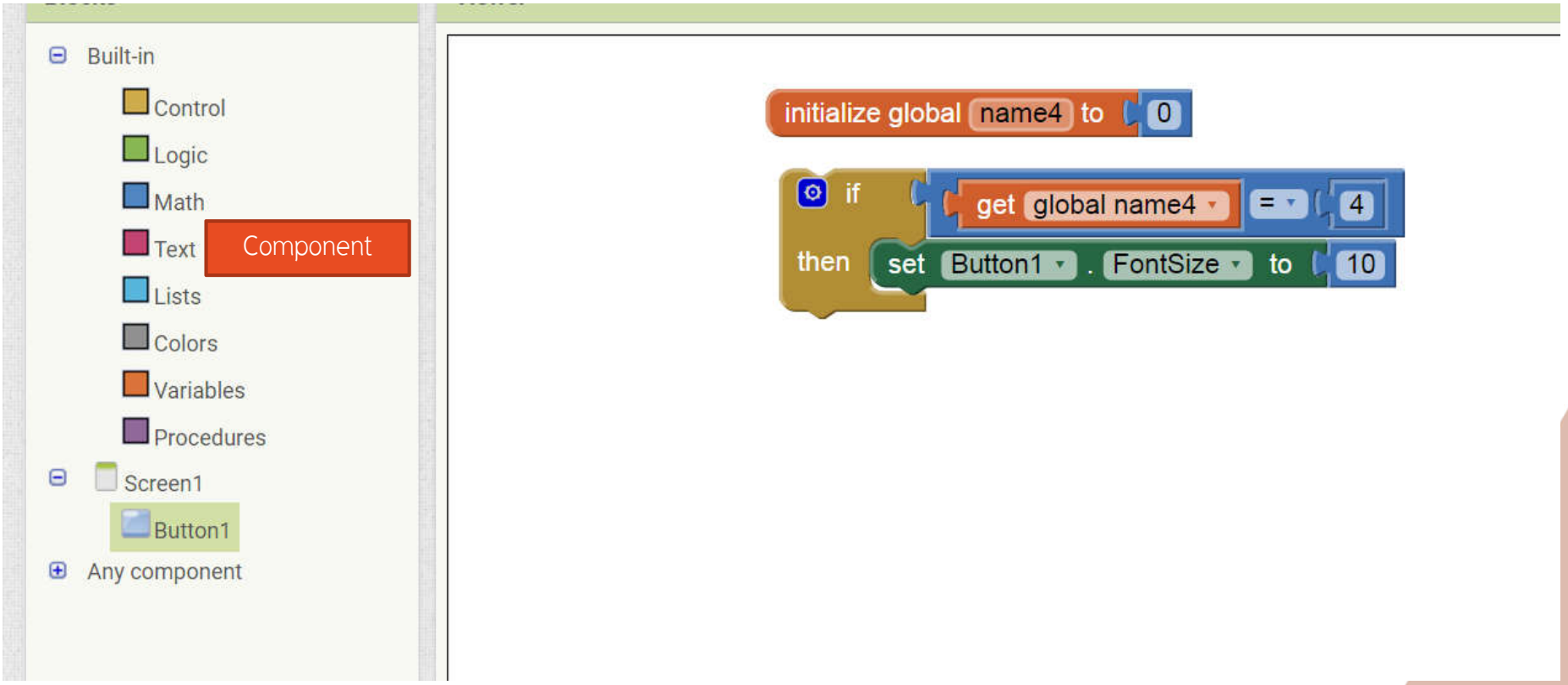
App Inventor

- User interface design



App Inventor

- Algorithm design



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Variable

Agenda

- Data
- Variable
- Expression

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Data

- Definition

"factual information (as measurements or statistics) used as a basis for reasoning, discussion, or calculation"

- *Properties*
  - *Data is changeable.*
  - *We only refer to our object of observation, not all of them.*

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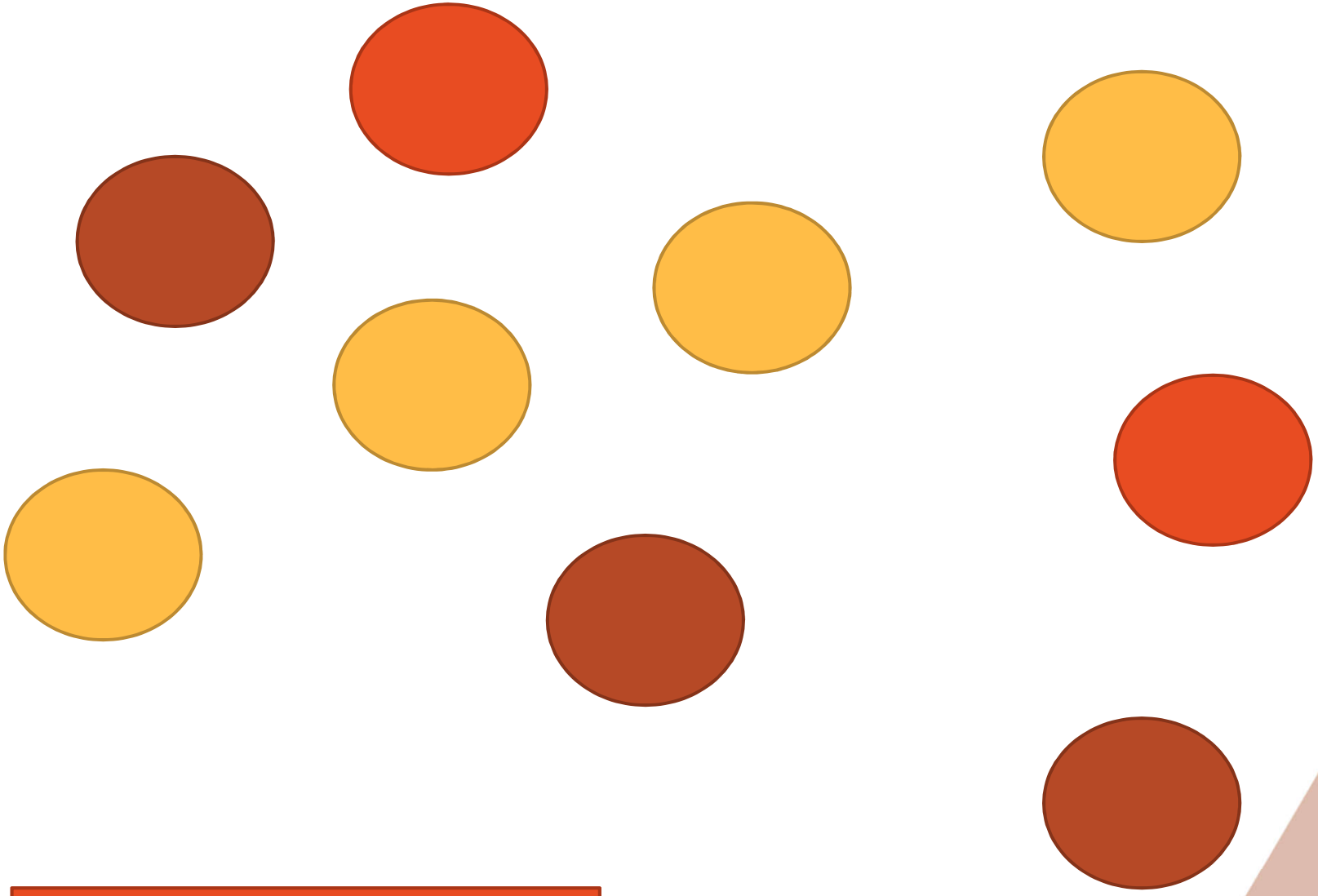

Case 1

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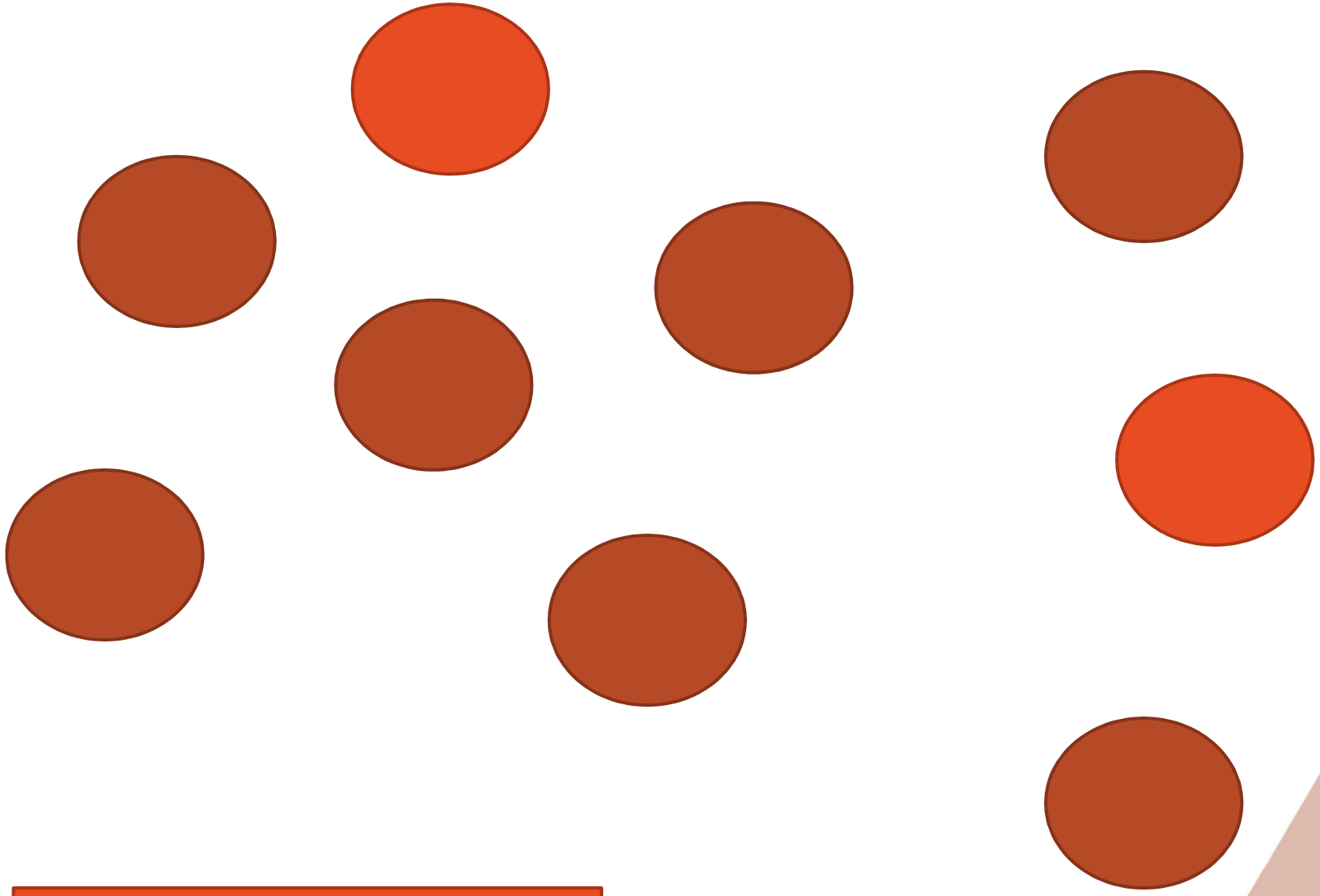
The number of yellow is “5”.



Case 2

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The number of yellow is “0”.

Data

- The same data but different value.

Data

Different scenarios require different data.

- It means the data must be changeable.
  - Depend on the user
- We call the unchangeable data as “constant”.
  - PI (π)

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Data

Think of data as water.

http://kingofwallpapers.com/water/water-027.jpg

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Data

- We need a data container.

- Similar to the cup.
  - If the water is an data.

VARIABLE

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SAME CUP, DIFFERENT AMOUNT OF COFFEE

http://thumb1.shutterstock.com/display_pic_with_logo/2742013/300104360/stock-vector-cup-of-tea-a-cup-of-coffee-and-an-empty-cup-300104360.jpg

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CUP = Variable

Water can change

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Variable

- The place in the memory.
- Store the value.
- You use the variable to access the value.
- You use the variable to change the value.

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What can we do with the Variable

- Assign
  - Assign the new value to the variable
  - The old value is replaced by the new value.

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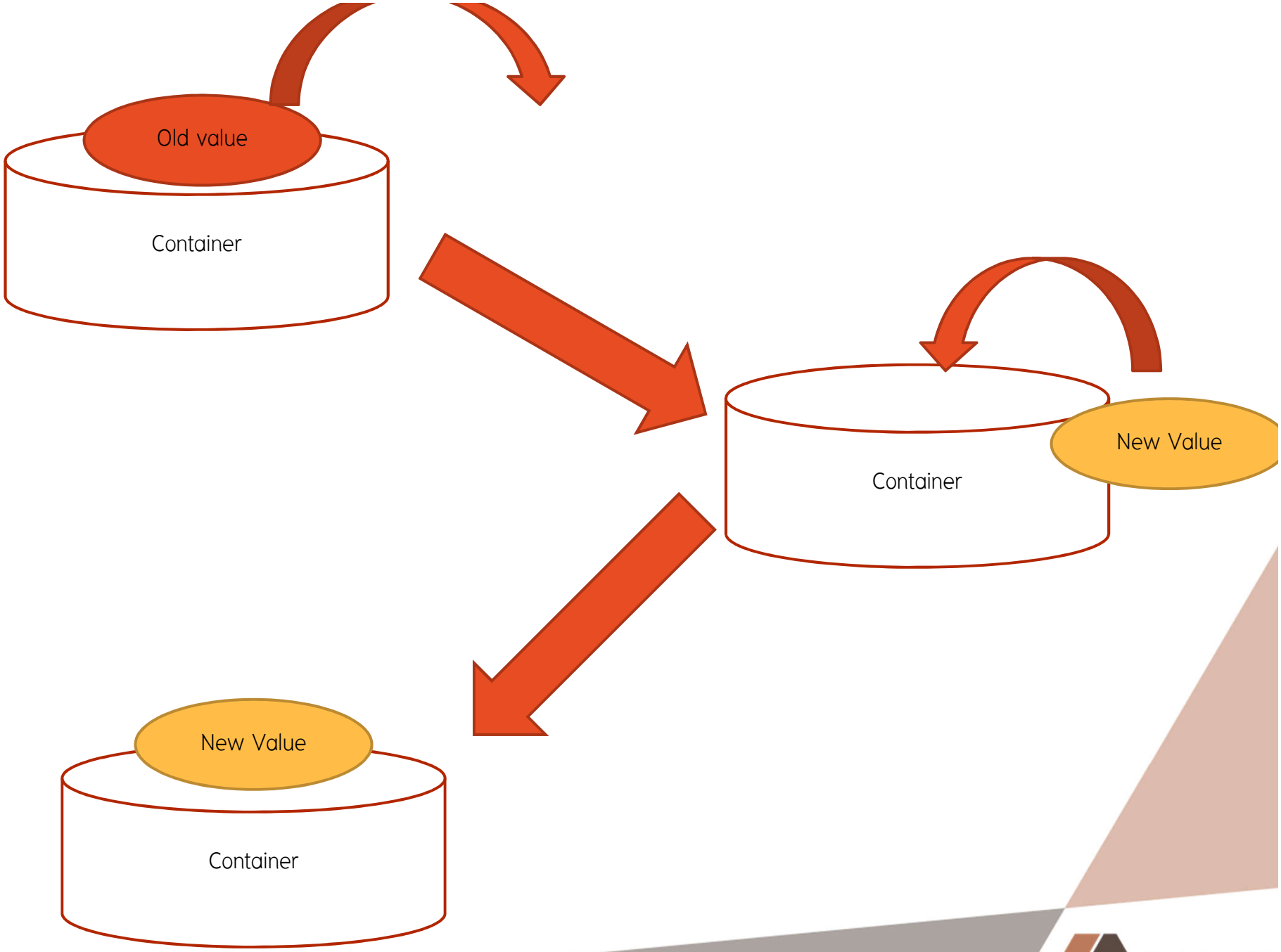
Old value
Container
Container
New Value
New Value
Container

What can we do with the Variable

- Use
  - Use to show to the users
  - Access the value in the container in the operation
    - Display the value
    - Use in the calculation

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Variable VS Properties

- Properties
  - Store the specific value of the objects.
  - The property is attached with the object.

- Variable
  - Store the value used for general purpose

- Properties and Variable
  - Requires
    - Name
    - Data type
  - Value can be changed to show

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Object of Heart

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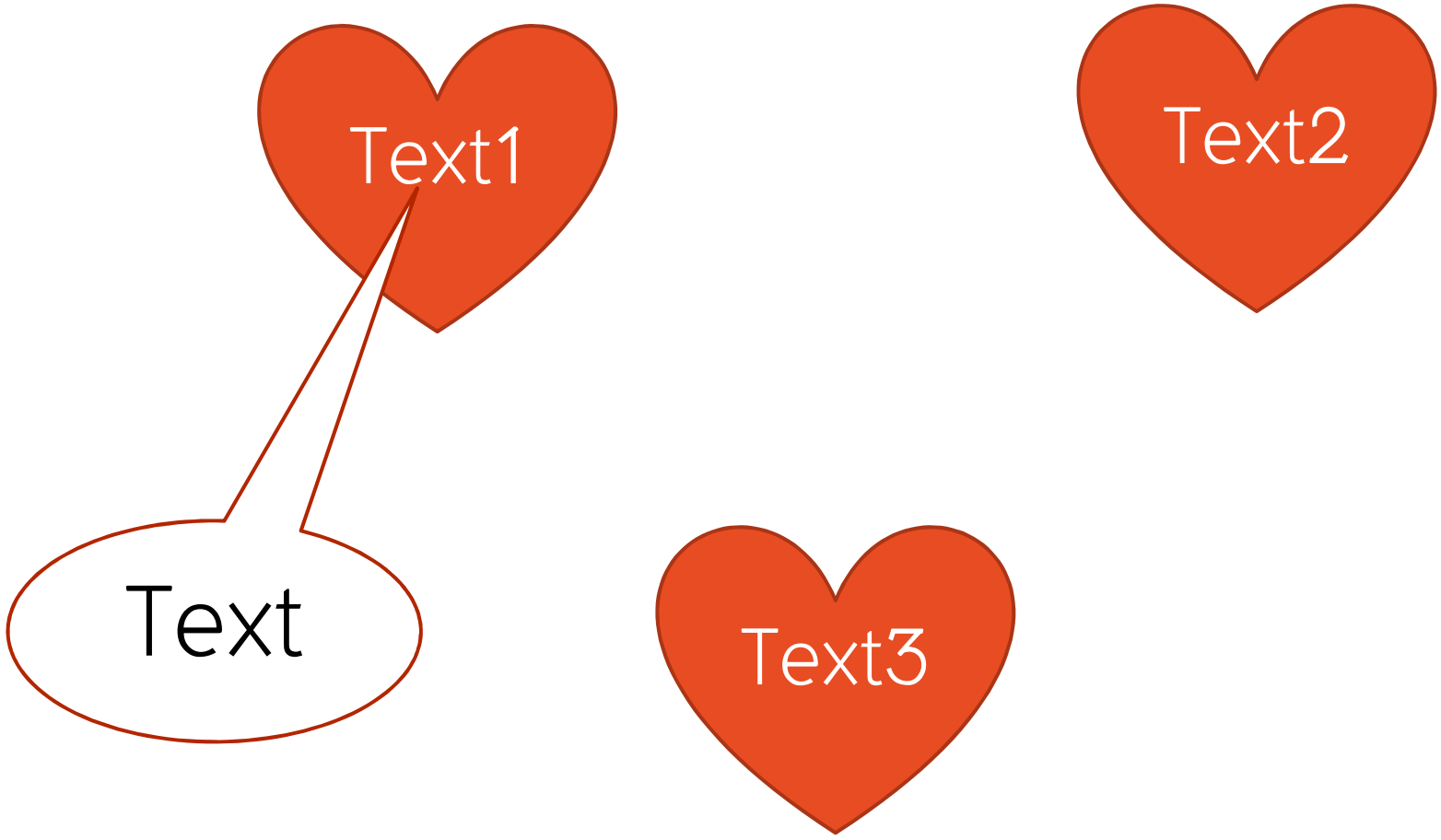
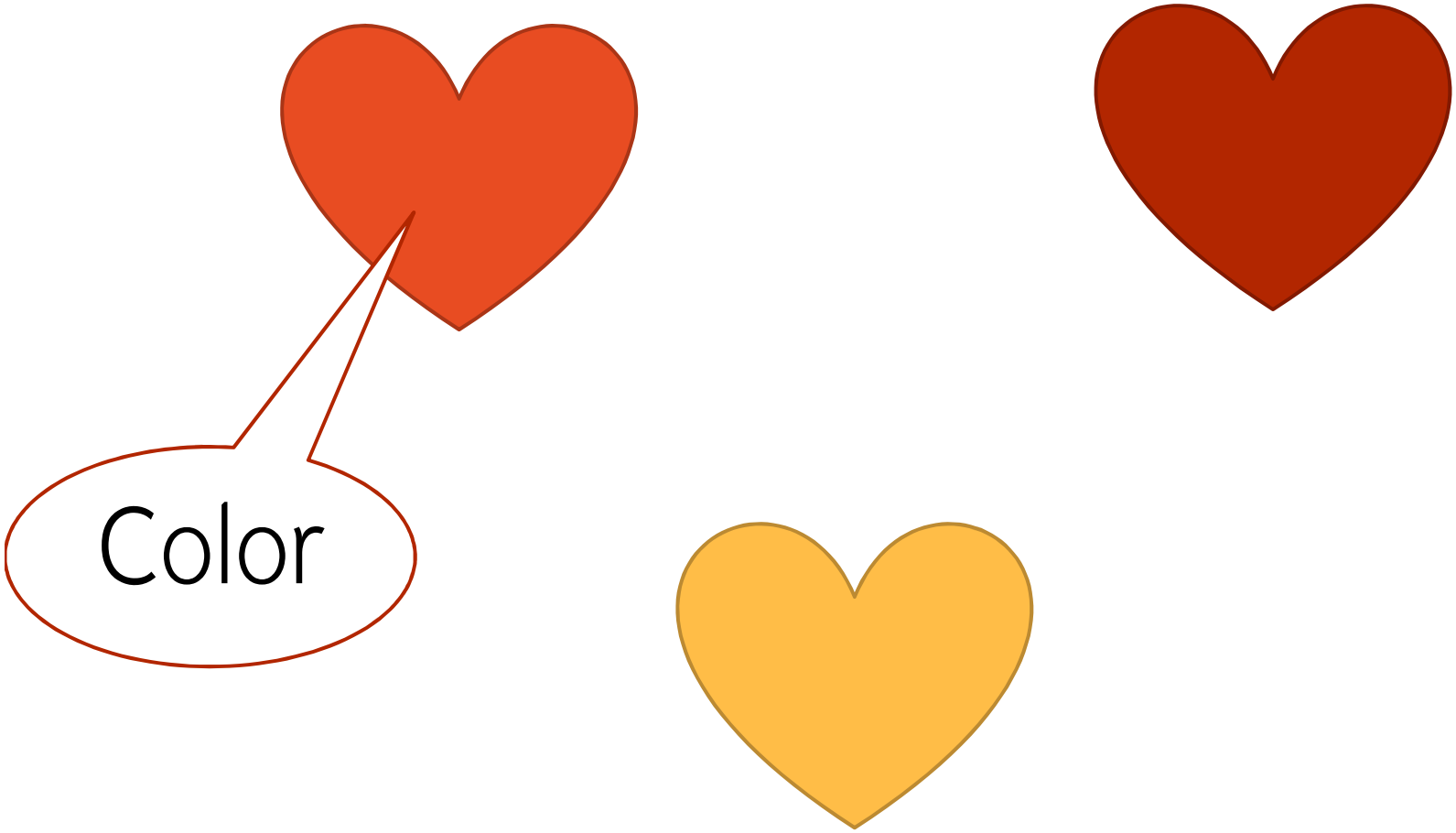

Text1
Text2
Text
Text3


Color

Data Types

- What the variable can store
- Difference programming languages
  - Different types and names
- There are 3 major types
  - String
  - Number
    - Fraction
    - Integer
  - Boolean

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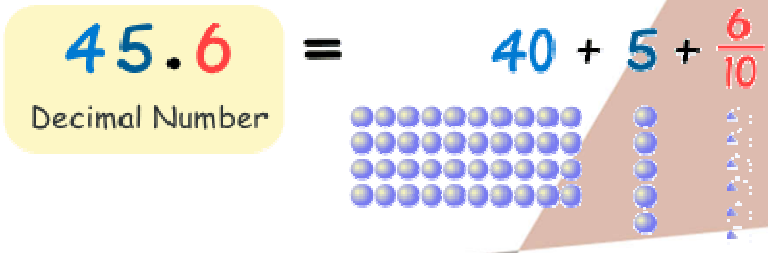
Data Types

- WholeNumber
  - int, long
  - a number without fractions; an integer
  - 1, 2, 7, - 11
- DecimalNumber
  - A decimal number is a number with one or more digits to the right of the decimal point
  - a number that uses a decimal point followed by digits that show a value smaller than one
  - Digit on the right is call fraction



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Data Types

- Boolean
  - Logical value
  - Represent the truth values of logic and Boolean algebra
  - Two values
    - True, false

- TextString
  - a sequence of characters
  - Words or sentences
  - Always surround by double quote (“)

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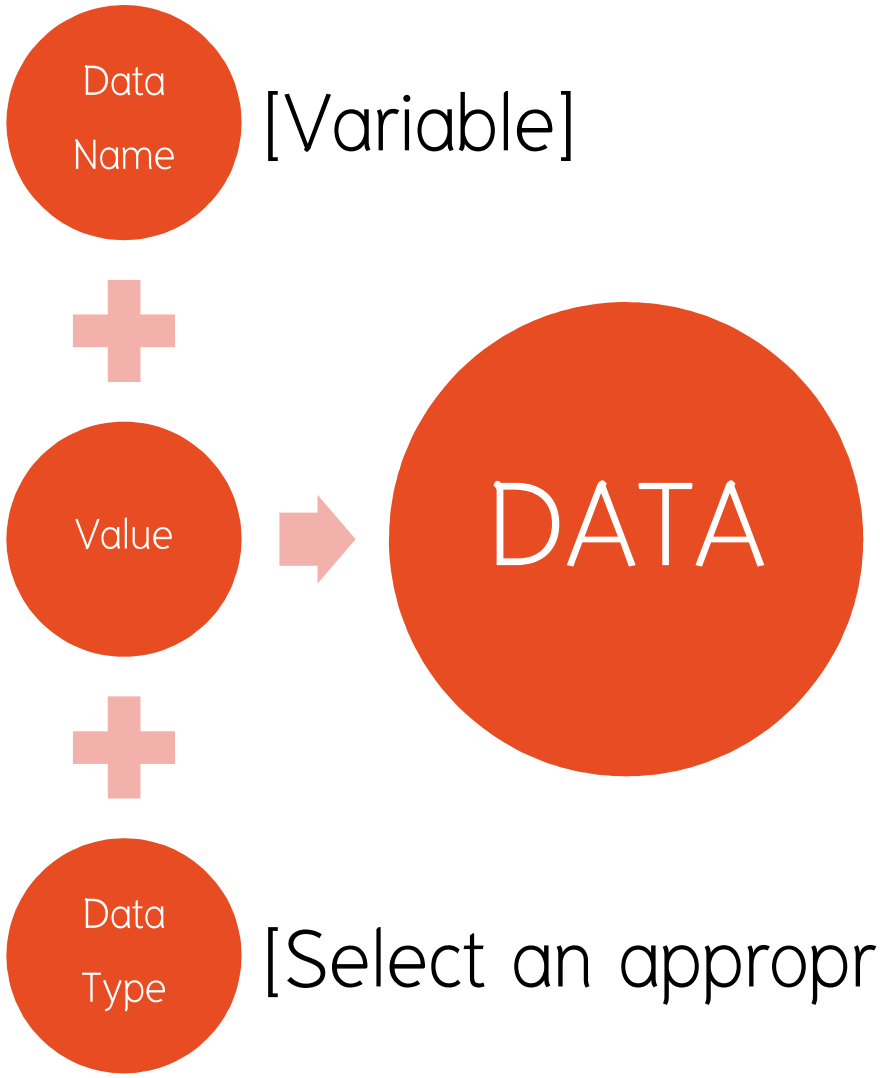
Data
Name
[Variable]
Value
DATA
Data
Type
[Select an appropriate one]

Choose the appropriate data type

- If you choose too big data type, it is a waste of space.
- If you choose too small data type, some information cannot be contained.

Expression

- Expression
  - a finite combination of symbols that is well-formed according to rules that depend on the context.
- Consists of operation and operand
  - Operand
    - the object of a mathematical operation
  - Operator
    - Mathematic operations
      - Plus, minus,
    - Logical operation
      - and, or, not

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Evaluate the expression

- 1+2+3
- 1*2+3
- 1+2*3

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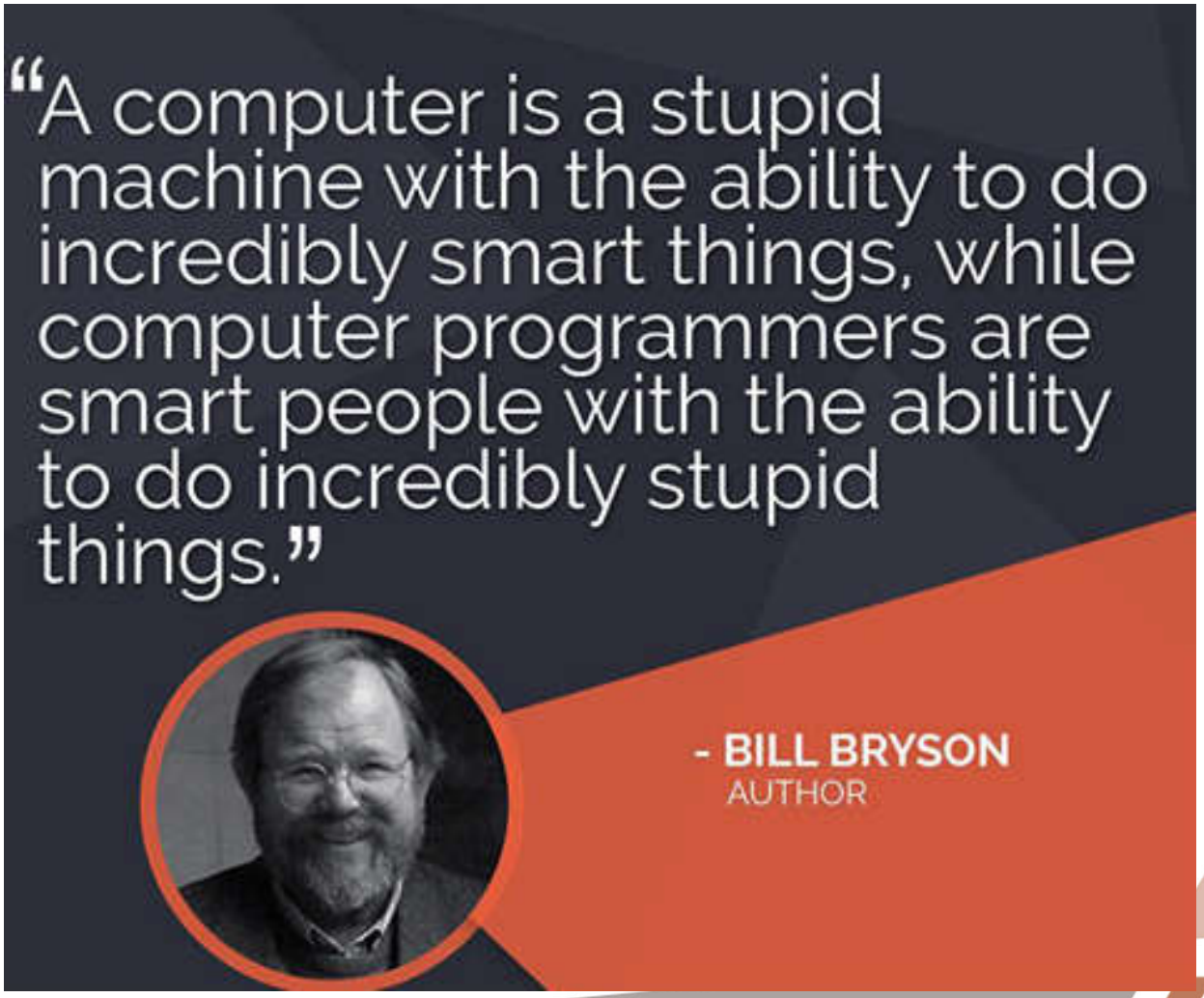
Operation Precedence

- Different precedence in each operator
  - Priority to be computed

- Higher precedence will be computed before the lower one.
  - Next lecture

Q&A



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