Programming Conventions

Identifier Naming Conventions

Lecture Contents

- This lecture is language-agnostic.
  - These conventions are used within all computer programming.
  - Some language-specific information is given for **Java**, **Python**, and **C#**, and **HTML**

Lecture Contents

- Vocabulary
- Naming Conventions
- Language-Specific Content
  - Java Naming Conventions

Vocabulary – ***variable***

- Computer programs need to store data
- The ***value*** of some such data may change as the program runs
- Programs refer to the place this data is stored as a ***variable***

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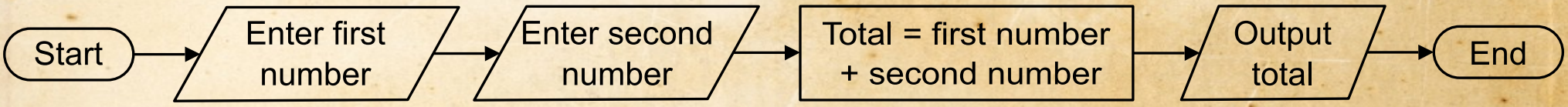
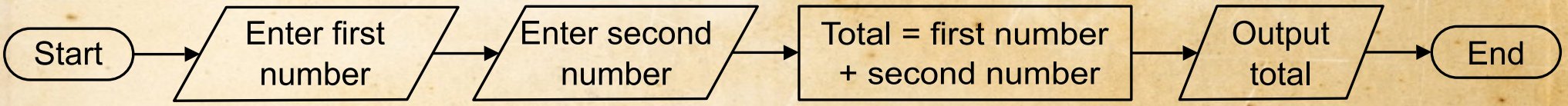


Vocabulary – ***variable***

- Computer programs need to store data
- The ***value*** of some such data may change as the program runs
- Programs refer to the place this data is stored as a ***variable***



- In the example algorithm from above, the program needs a place to store the “first number” and the “second number”.
  - This algorithm uses at three ***variables***:
    “first number”, “second number”, and “total”.

Vocabulary – ***identifier*** or ***label***

- Programers need a way to refer to its *variables*.
- A unique name given to a *variable* is called an ***identifier*** or a ***label***.

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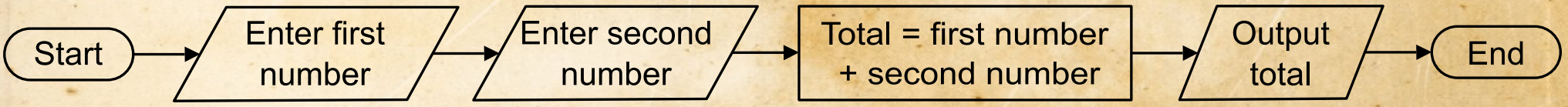
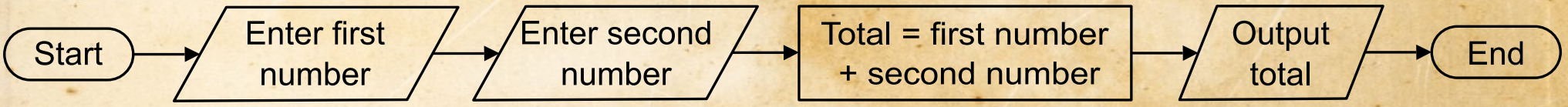


- In the example above, we might label the "first number" as `firstNumber` and the second as `secondNumber`.
  - I often draw ***variables*** as a box with the ***identifier*** above it; the value can then be written in the box:

`firstNumber` `secondNumber`

Vocabulary – ***identifier*** or ***label***

- Programers need a way to refer to its *variables*.
- A unique name given to a *variable* is called an ***identifier*** or a ***label***.



- In the example above, we might label the "first number" as `firstNumber` and the second as `secondNumber`.
- Basically every programming language does <u>not</u> allow any whitespace within an ***identifier***.
  - For example, we cannot use `first number` as a label because there is a space between the two words.

Vocabulary

- Vocabulary
  - ***variable***: a “container” used to store data. The value of the data may change as the program is run.
  - ***identifier*** or ***label***: the unique name given to a variable
    - or the unique name given to a constant, function, class, etc. (which we will learn about later)

Naming Conventions

- Variable names should be **descriptive** to make the code easy to read.
- Since we cannot use whitespace, lower case may be hard to read.
  - `hardtoreadthisvariblename`

Naming Conventions

- Variable names should be **descriptive** to make the code easy to read.
- Since we cannot use whitespace, lower case may be hard to read.
  - `hardtoreadthisvariblename`
- So, programmers have come up with conventions to make *identifiers* easier to read.
  - `easierToReadThisVariableName`
  - `this_one_is_easy_to_read_too`
  - `maybe-you-like-this-style`
- Each programming language has its preferred convention.

Naming Conventions

- The next slides will give an introduction different styles for naming conventions.
- The names of these conventions will not be tested
- However, you must use the appropriate naming conventions when you write your code!

Naming Conventions – *Camel Case*

- ***Camel case***, sometimes called ***lower camel case***:
  - The first letter of the first word is lower case
  - The first letter of every subsequent word is upper case
  - All other letters are lower case
  - Examples:
    - `firstNumber`
    - `userName`
    - `studentDateOfBirth`

Java uses camel case for names of *variables* and *methods*.
Python does not use lower camel case.
C# uses camel case for names of *variables*

Naming Conventions – *Pascal Case*

- ***Pascal case***, sometimes called ***upper camel case***:
  - The first letter of every word is upper case
  - All other letters are lower case
  - Examples:
    - `FirstNumber`
    - `UserName`
    - `StudentDateOfBirth`

Java uses Pascal case for *class* names.
Python uses Pascal case *class* names.
C# uses Pascal case for names of *constants*, *classes*, and *methods*, etc.

Naming Conventions – *Upper Case*

- ***Upper case***:
  - All letters are upper case
  - Usually an underscore between each word for improved readability
  - Examples:
    - `FIRST_NUMBER`
    - `USER_NAME`
    - `STUDENT_DATE_OF_BIRTH`

Java uses Pascal case for names of *constants*.
Python uses Pascal case for names of *constants*.
C# does not use upper case

Naming Conventions – *Snake Case*

- ***Snake case***:
  - All letters are lower case
  - An underscore between each word for improved readability
  - Examples:
    - `first_number`
    - `first_name`
    - `student_date_of_birth`

Java does not use snake case.
Python uses snake case for names of variables, functions, modules, etc.
C# does not use snake case

Naming Conventions – *Kebab Case*

- ***kebab case*** (kebab = 串儿):
  - All letters are lower case
  - A hyphen between each word for improved readability
  - Examples:
    - `first-number`
    - `first-name`
    - `student-date-of-birth`

Java does not use kebab case.
Python and **C#** do not use kebab case.
Kebab case is used in **HTML** for attributes

Lecture Contents

- Vocabulary
- Naming Conventions
- Language-Specific Content
  - **Java Naming Conventions**
  - Python Naming Conventions

Java Naming Conventions

- Java uses the following naming conventions:
  - Class names: `PascalCase`
  - Method names: `camelCase`
  - Variable names: `camelCase`
  - Constant names: `UPPER_CASE`
- Names must not be one of the Java reserved words.
  - `public`, `int`, `void`, `class`, etc.
- Remember that all names should be concise yet **descriptive**.

Reserved Words in Java

- The following are ***reserved words*** in Java, so can not be used as identifiers (note that all are lower case):

abstract	assert	boolean	break	byte	case
catch	char	class	const	continue	default
do	double	else	enum	extends	final
finally	float	for	goto	if	implements
import	instanceof	int	interface	long	native
new	package	private	protected	public	return
short	static	strictfp	super	switch	synchronized
this	throw	throws	transient	try	void
volatile	while	_	true	false	null

Java Naming Conventions

- Java uses the following naming conventions:
  - Class names: `PascalCase`
  - Method names: `camelCase`
  - Variable names: `camelCase`
  - Constant names: `UPPER_CASE`
- You won't be tested on the names, but you must be aware of these, and use the appropriate one for the programming language you're using.
- Remember that all names should be concise yet **descriptive**.

Lecture Contents

- Vocabulary
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  - **Python Naming Conventions**

Python Naming Conventions

- Python uses the following naming conventions:
  - Class names: `PascalCase`
  - Module names: `snake_case`
  - Function/Method names: `snake_case`
  - Variable names: `snake_case`
  - Constant names: `UPPER_CASE`
- Names must not be one of the Python reserved words.
  - `public`, `int`, `void`, `class`, etc.
- Remember that all names should be concise yet **descriptive**.

Reserved Words in Python

- The following are ***reserved words*** in Python, so can <u>not</u> be used as identifiers:

`False`	`True`	`None`		
`and`	`as`	`assert`	`async`	`await`
`break`	`class`	`continue`	`def`	`del`
`elif`	`else`	`except`	`finally`	`for`
`from`	`global`	`if`	`import`	`in`
`is`	`lambda`	`nonlogical`	`not`	`or`
`pass`	`raise`	`return`	`try`	`while`
`with`	`yield`			

- Note that Python is case sensitive, so `False`, `True`, and `None`, not `false`, `FALSE`, etc.

Programming Conventions

Identifier Naming Conventions