# Welcome to Transcode

Lecture 1: What is this programming thing anyway

# That programming stuff

## How does a computer work?

Parts:

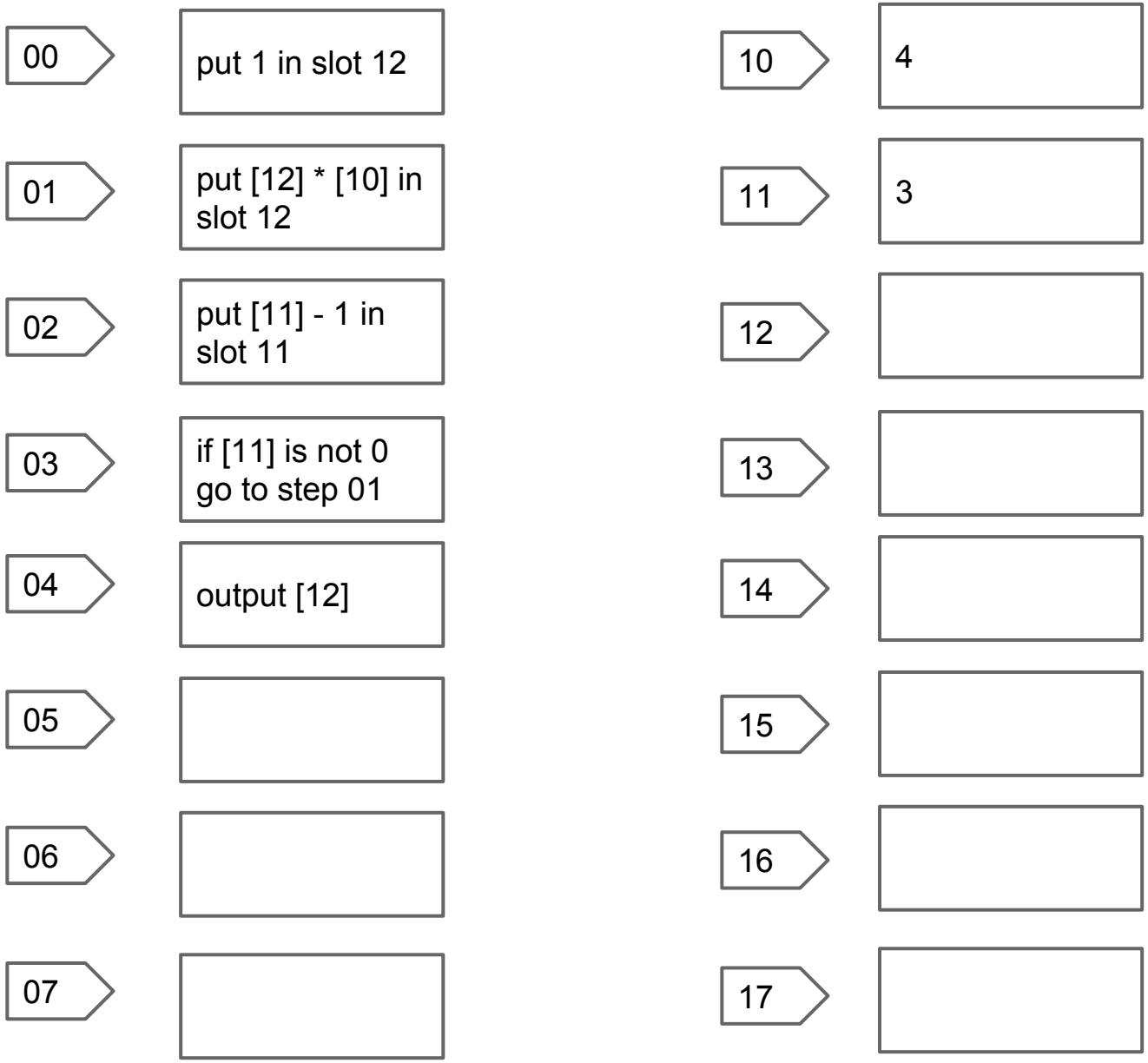
- Memory.  Numbered buckets with numbers in them.
- A set of **instructions** which can be kept in memory.
- A **program counter** which keeps track of what instruction you're on.
- An arithmetic logic unit, which makes calculations

## How does a computer work?

What does it do:

- Looks at where the program counter points
- Interprets that as an **instruction** with **arguments**
- Loads the **arguments** from memory into the ALU and **executes** the instruction
- Stores the **result** back to memory
- Adjusts the program counter
  - Usually just the next instruction
  - Sometimes, jumps to a different one

# Let's do an example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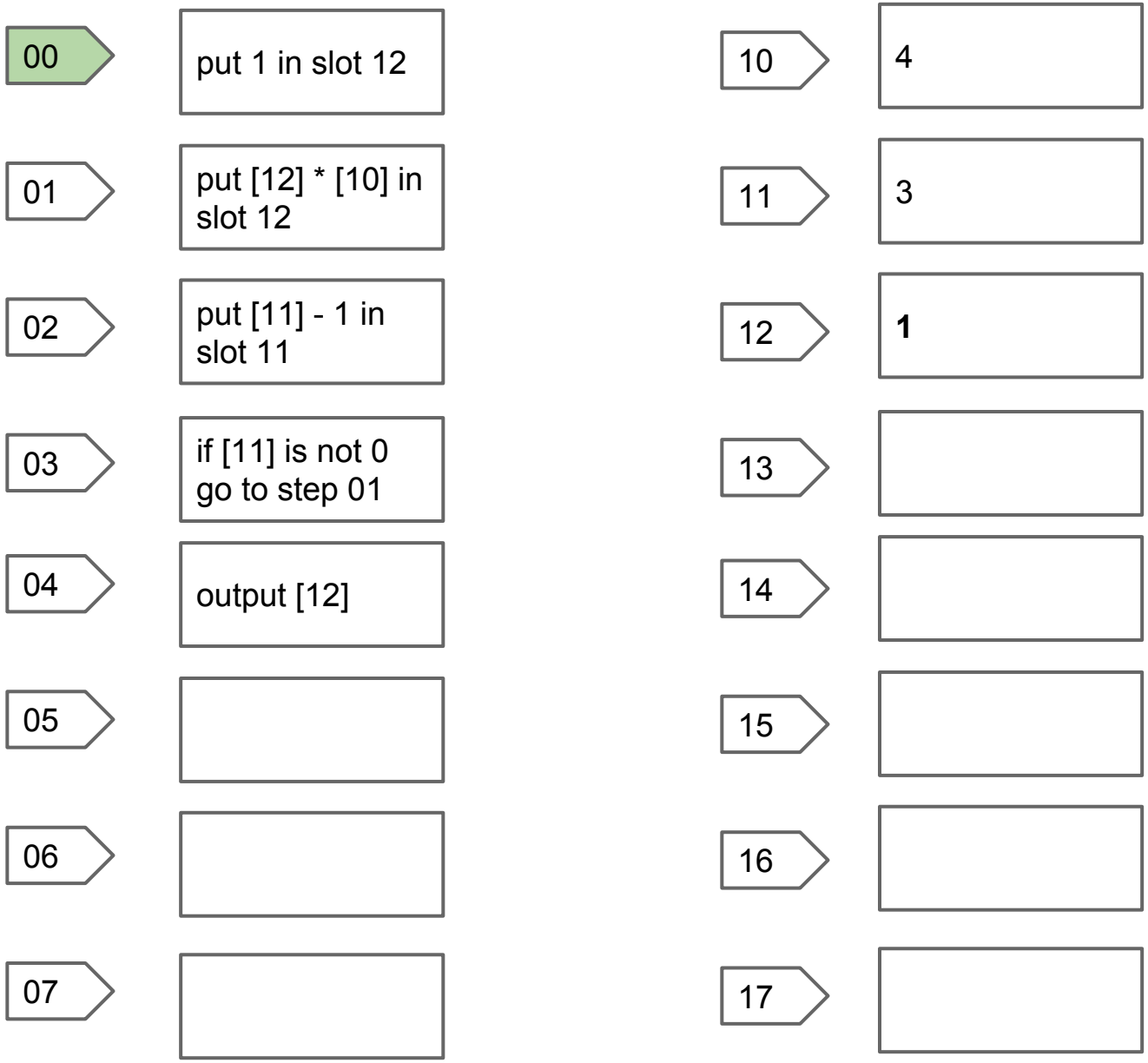
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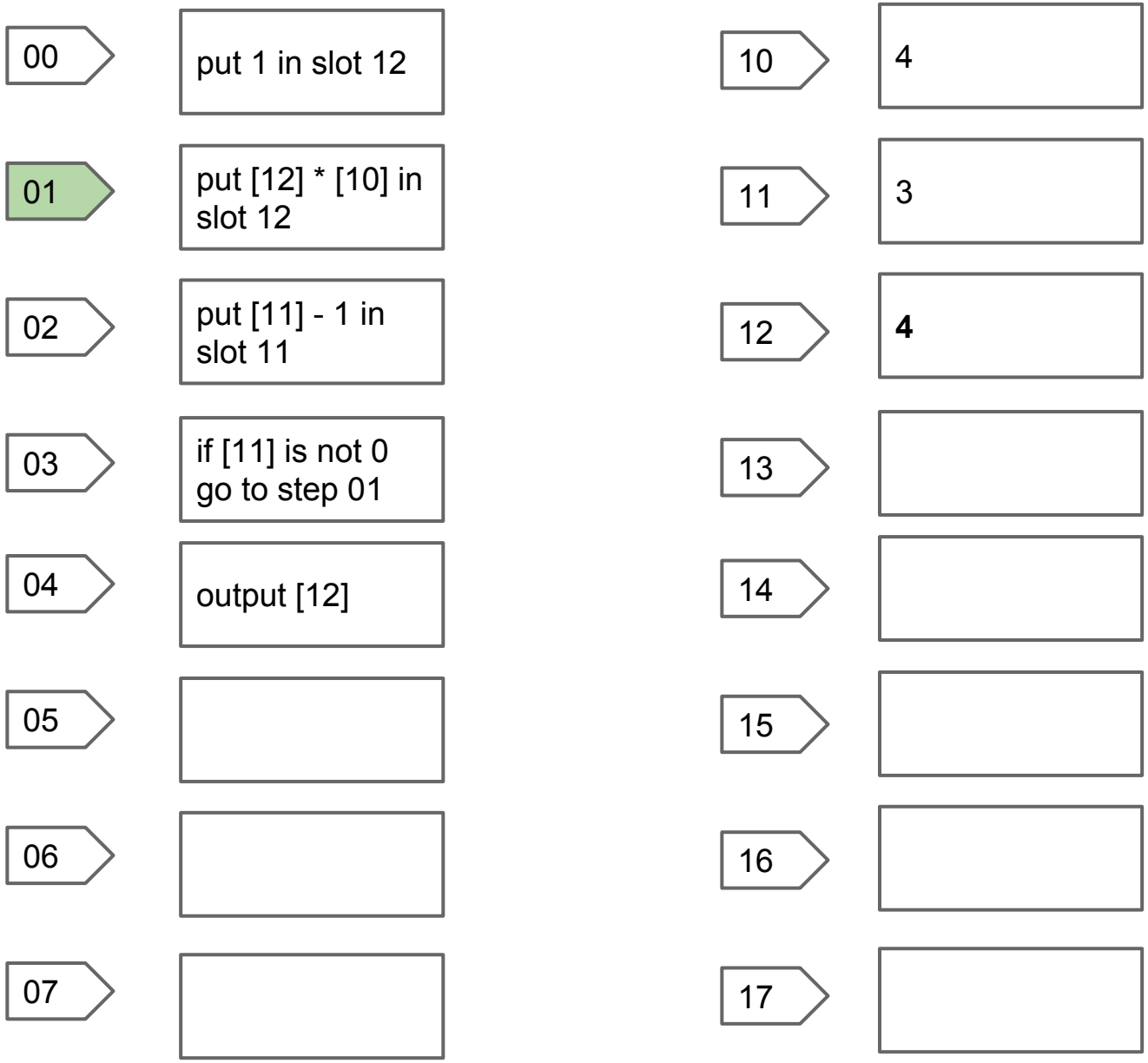
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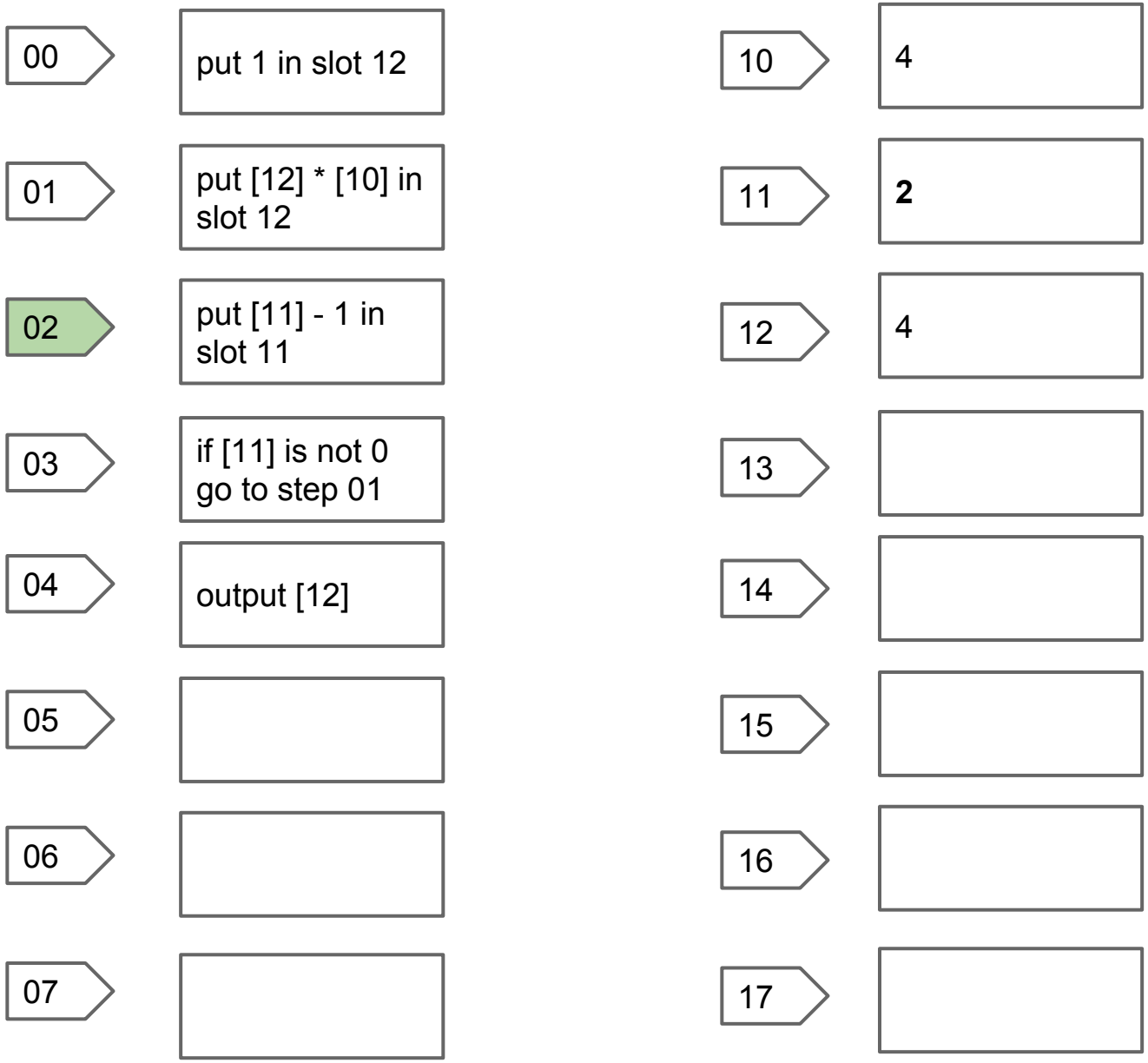
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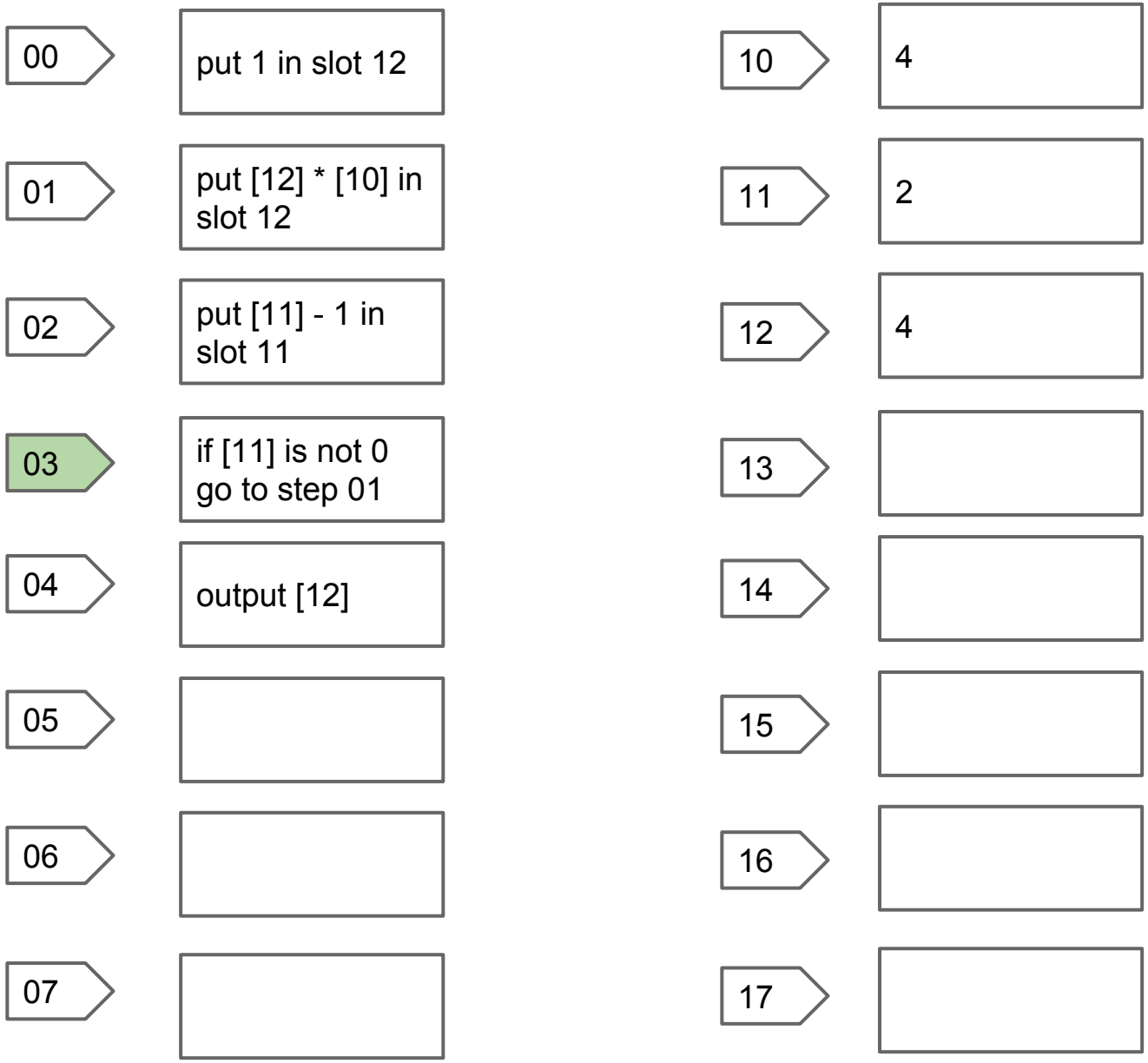
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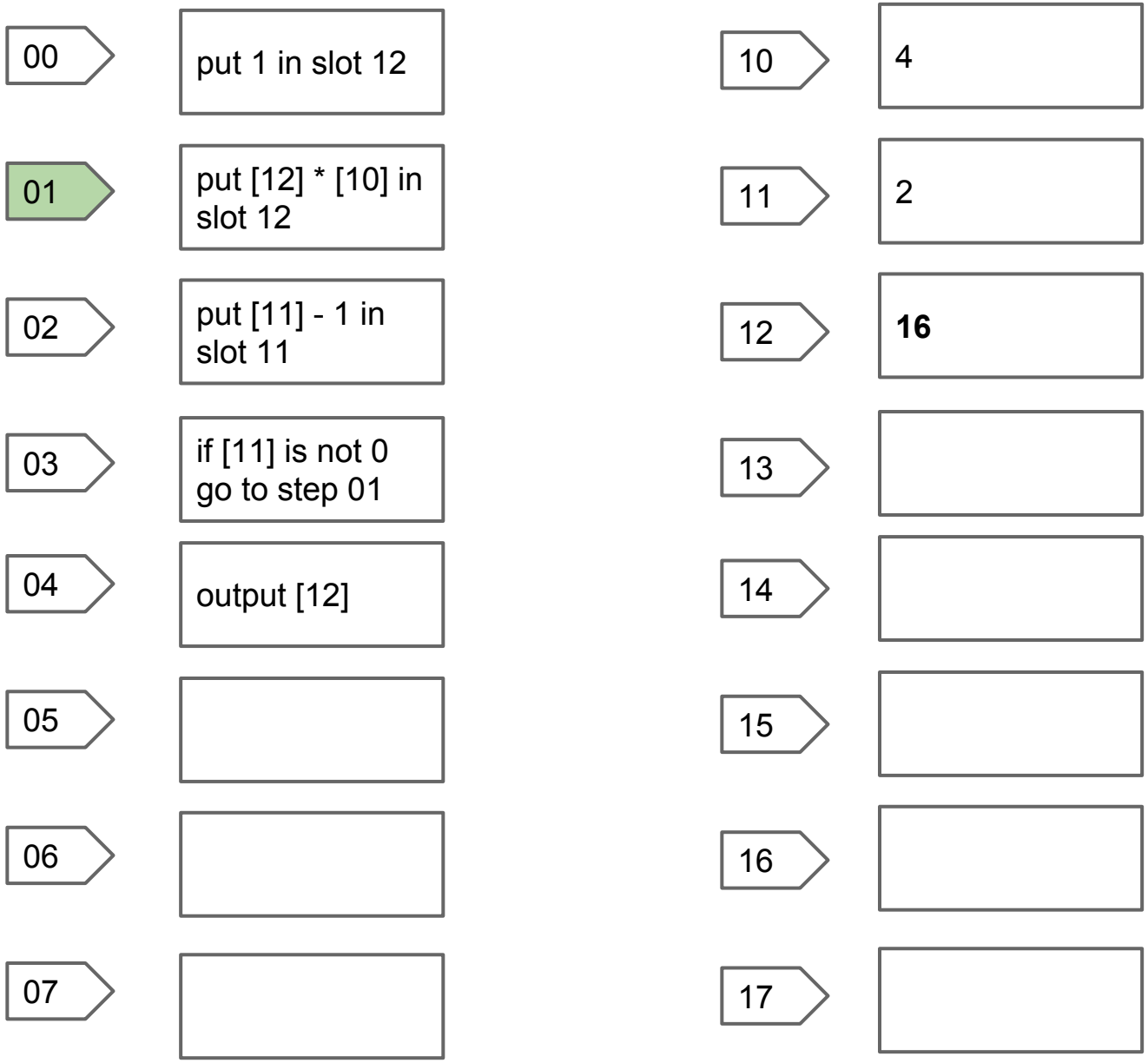
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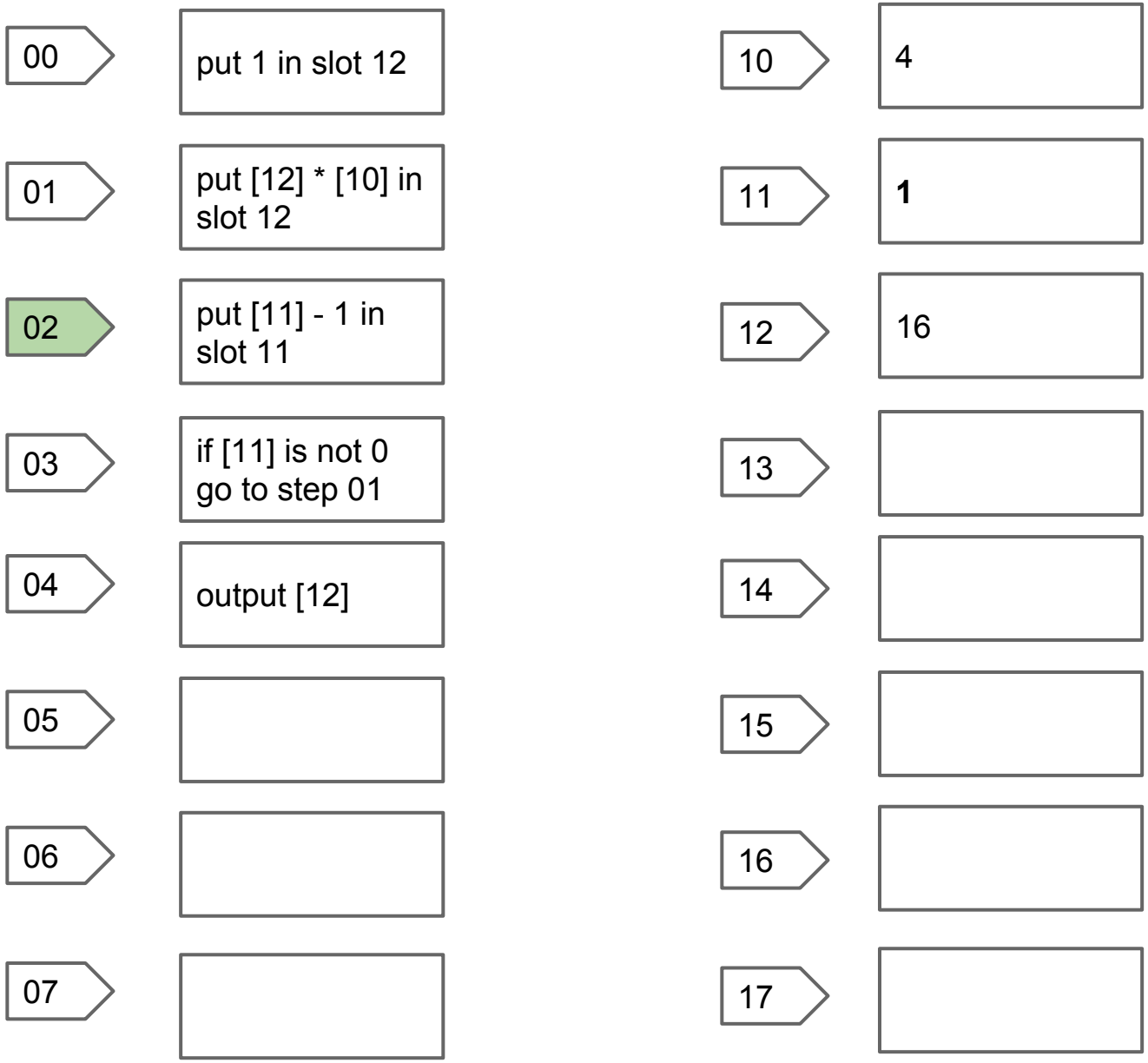
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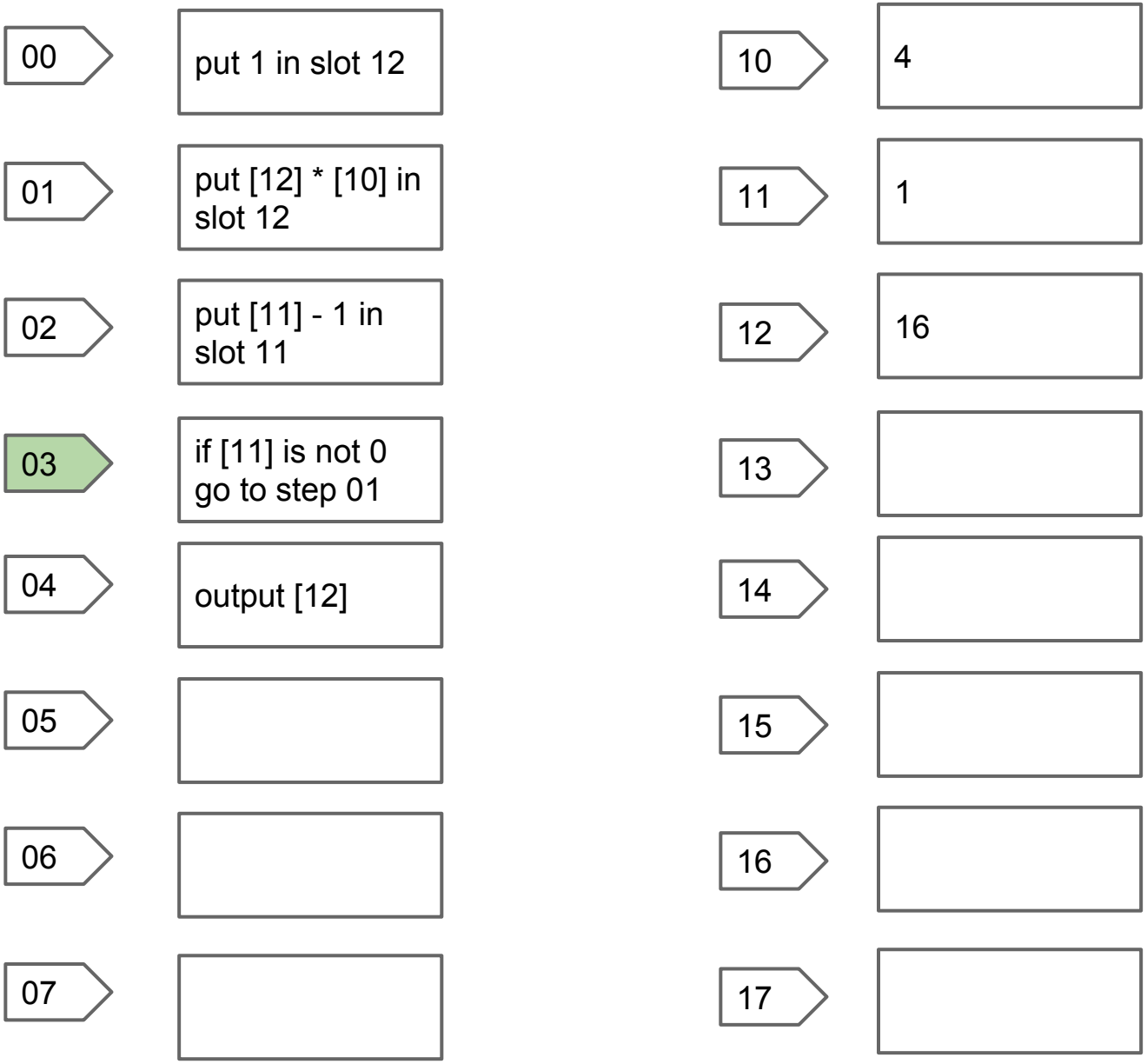
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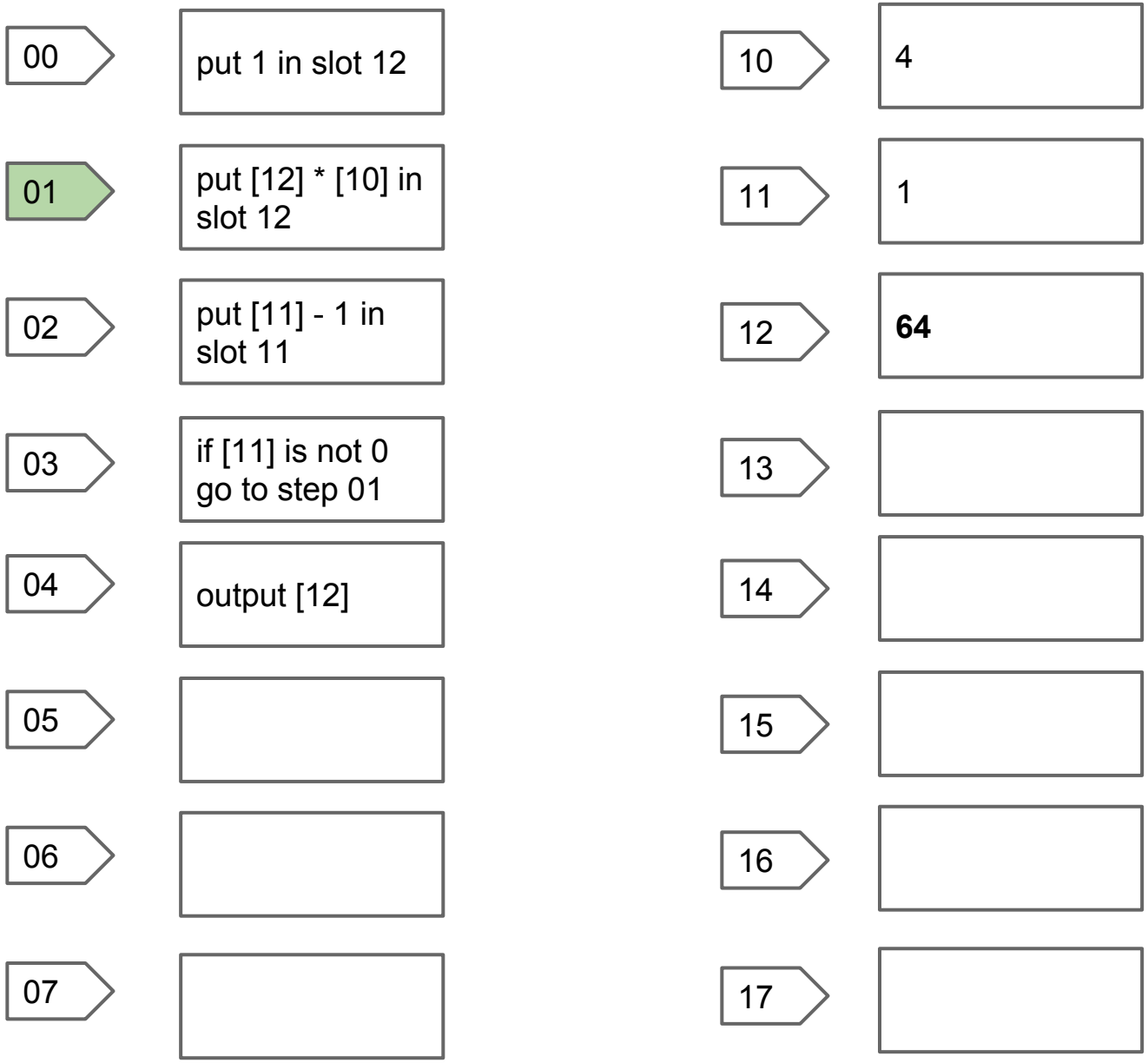
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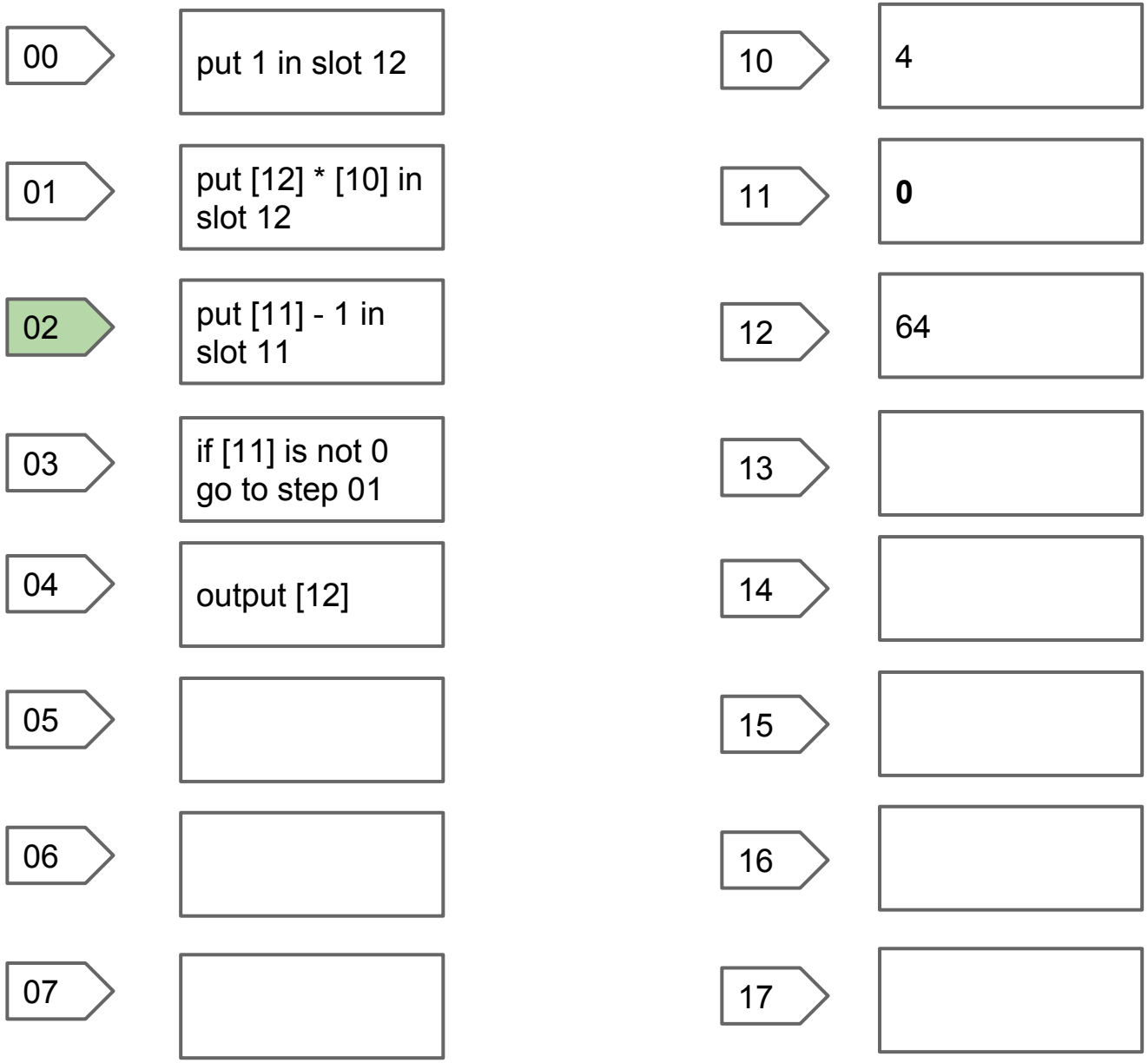
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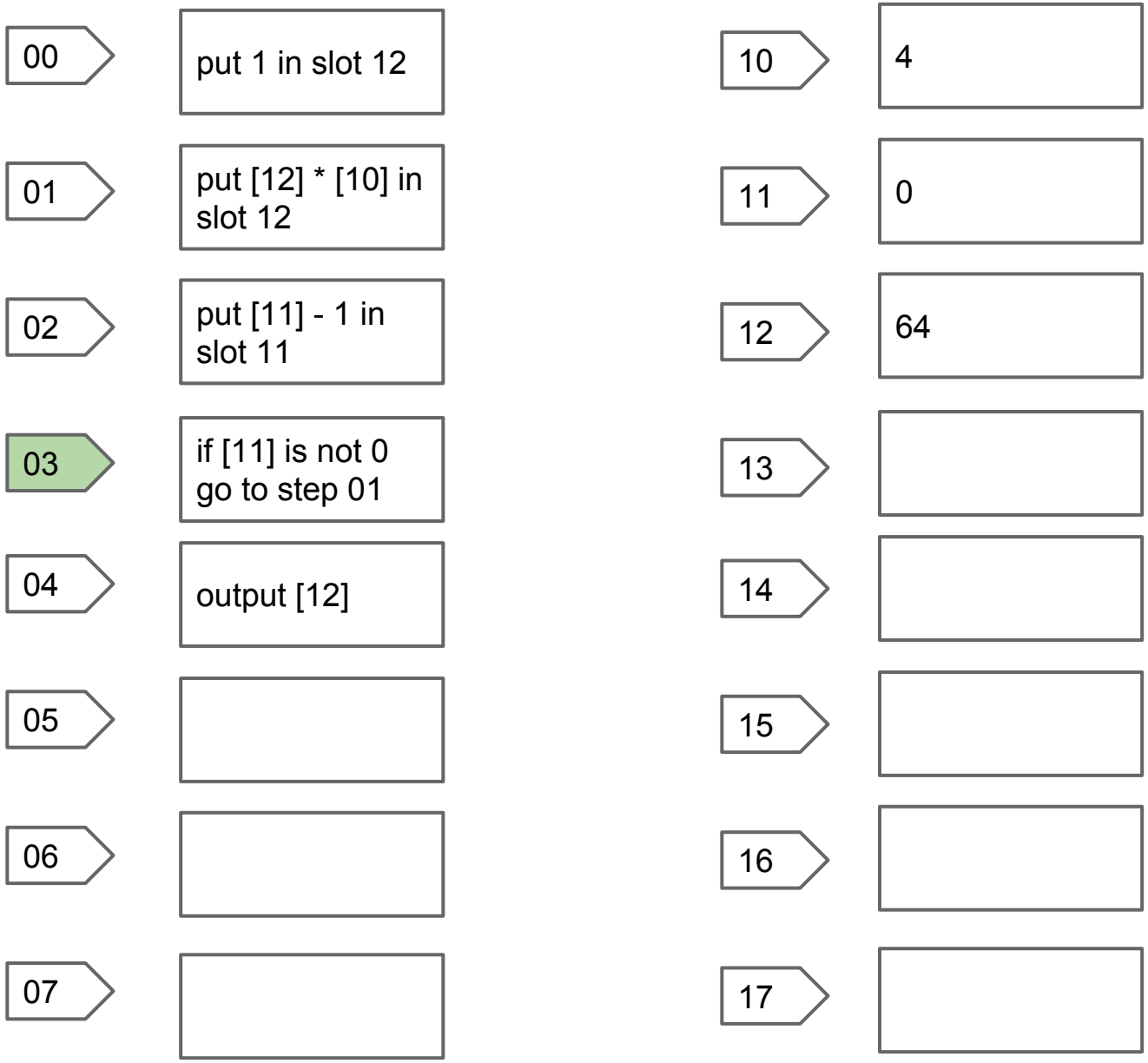
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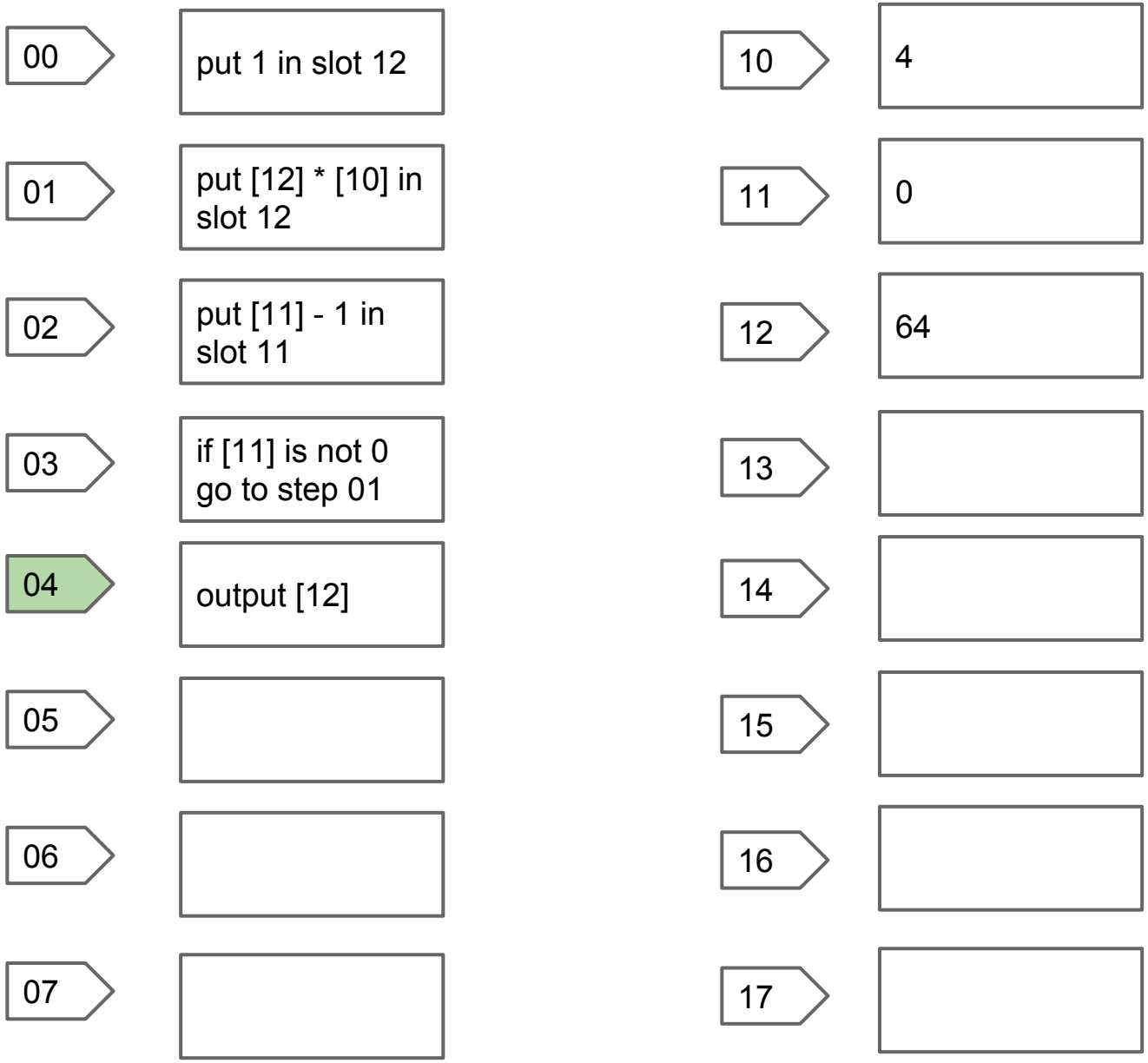
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# What did that do?

# Very simple instructions

**(we would be pretty frustrated)**

# Compiler

Is a program that takes complicated instructions, and **translates** them to simple instructions.

# Interpreter

Is a program that takes complicated instructions and **follows** them.

# Writing complicated instructions

- More complicated for the computer.  Less complicated for you.
- The rules for writing them is called a **programming language**
- We'll be using **Python**
- Specifically, Python is an interpreted language