

# Embedded Systems with ARM Cortex-M3 Microcontrollers in Assembly Language and C

## Chapter 7 Structured Programming

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Spring 2015

# Divide and Conquer

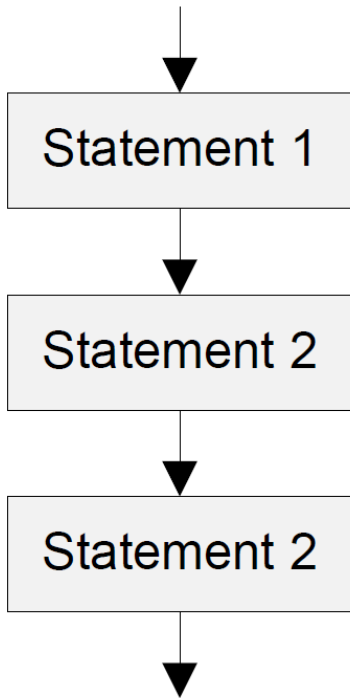
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***"Nothing is particularly hard if you divide it into small jobs."***

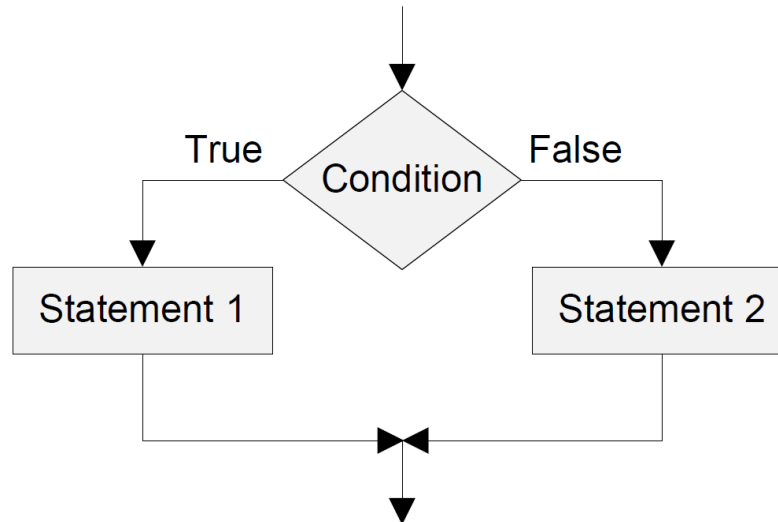
Henry Ford, Founder of Ford Motor

# Three basic control structures

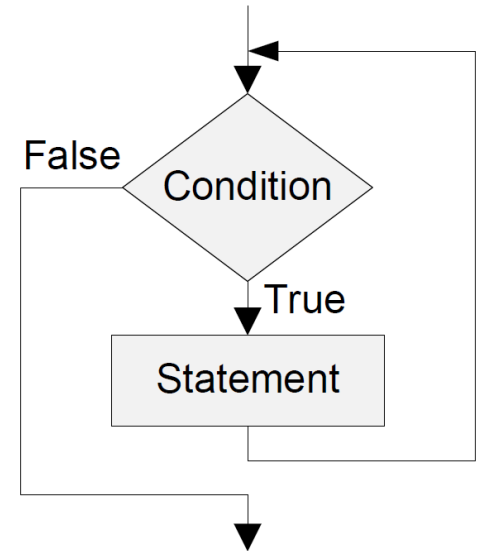
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Sequence Structure



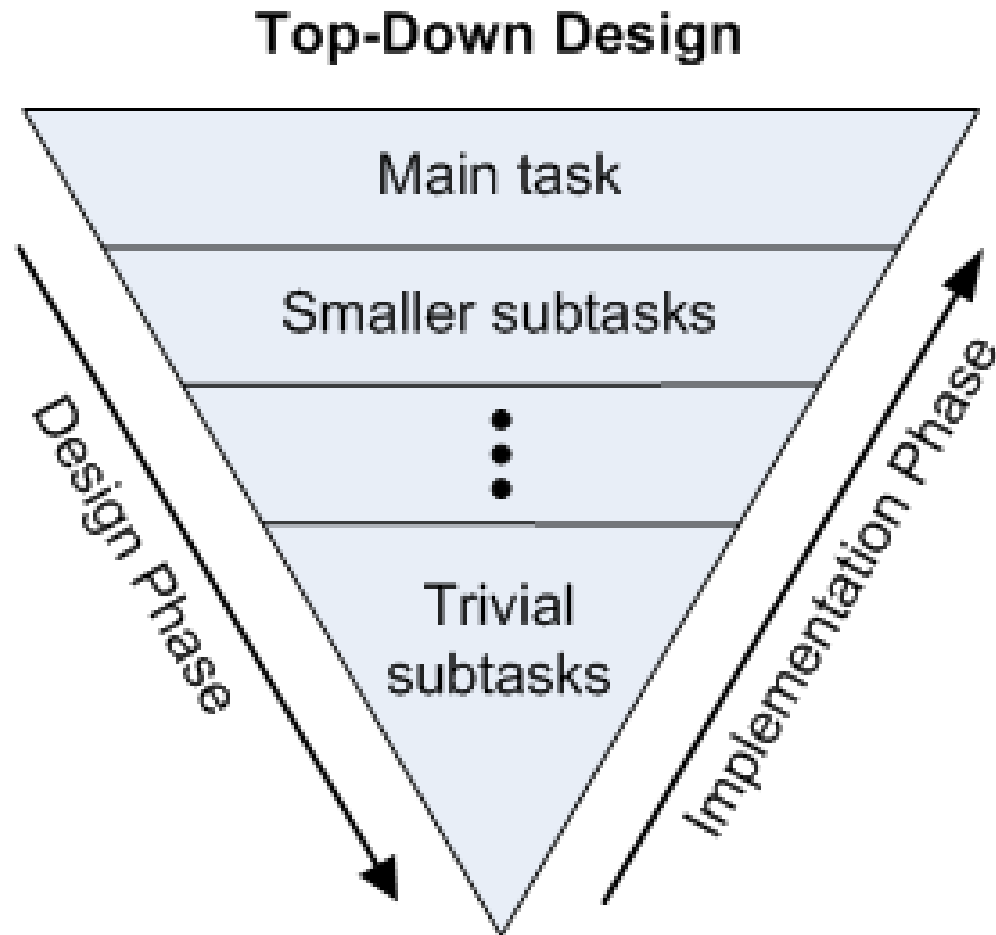
Selection Structure



Loop Structure

# Top-Down Design

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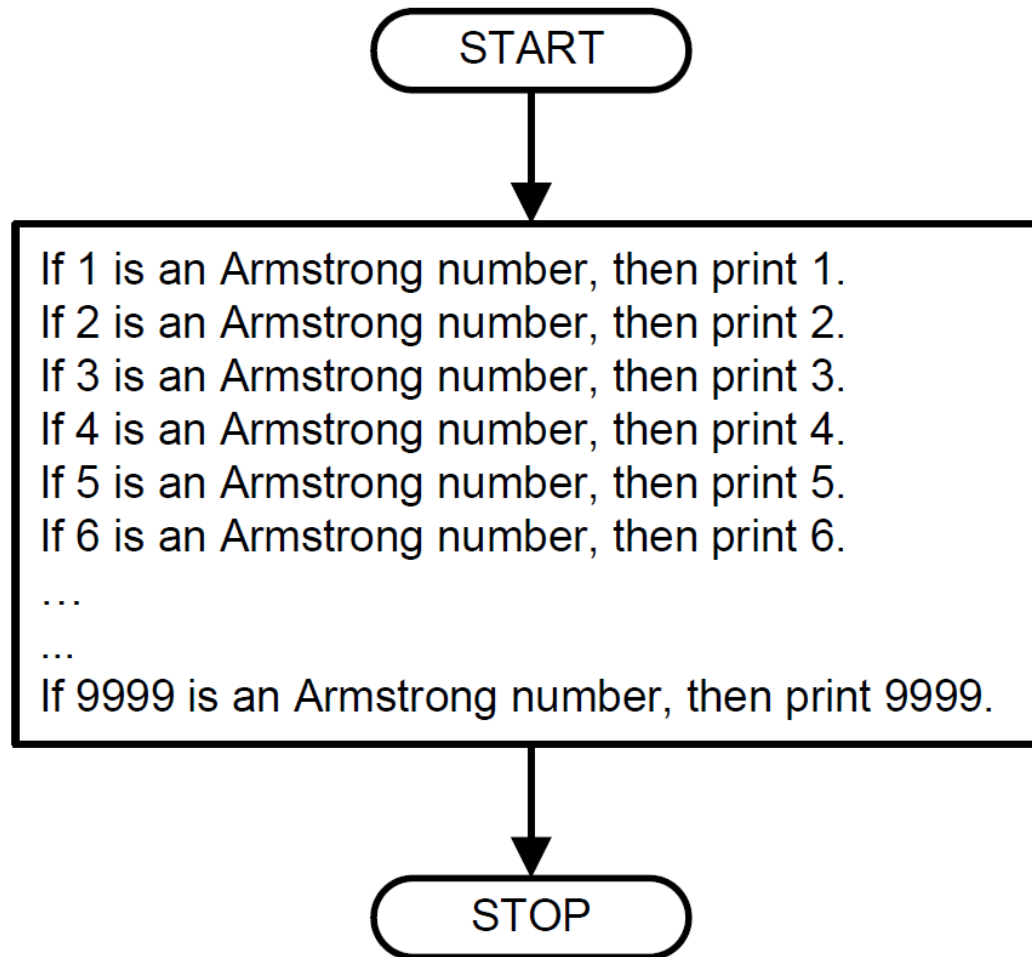
# Top-Down Design Example

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- ▶ Find all Armstrong numbers less than 10,000
- ▶ Given a positive integer that has  $n$  digits, it is an Armstrong number if the sum of the  $n^{\text{th}}$  powers of its digits equals the number itself.
- ▶ For example, 371 is an Armstrong number since we have  $371 = 3^3 + 7^3 + 1^3$ .

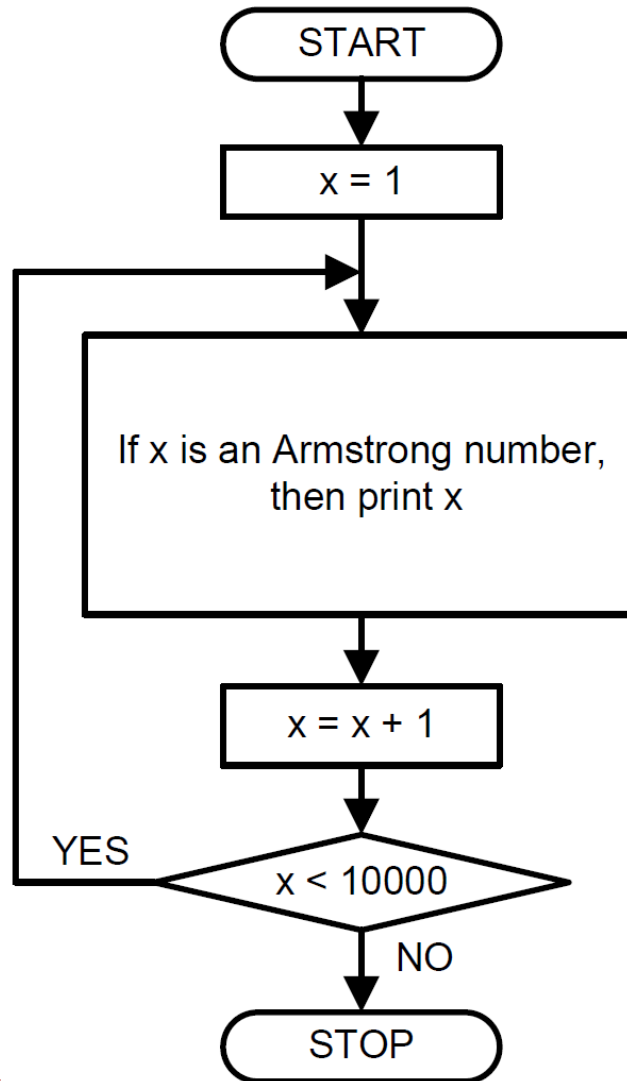
# Top-Down Design Example

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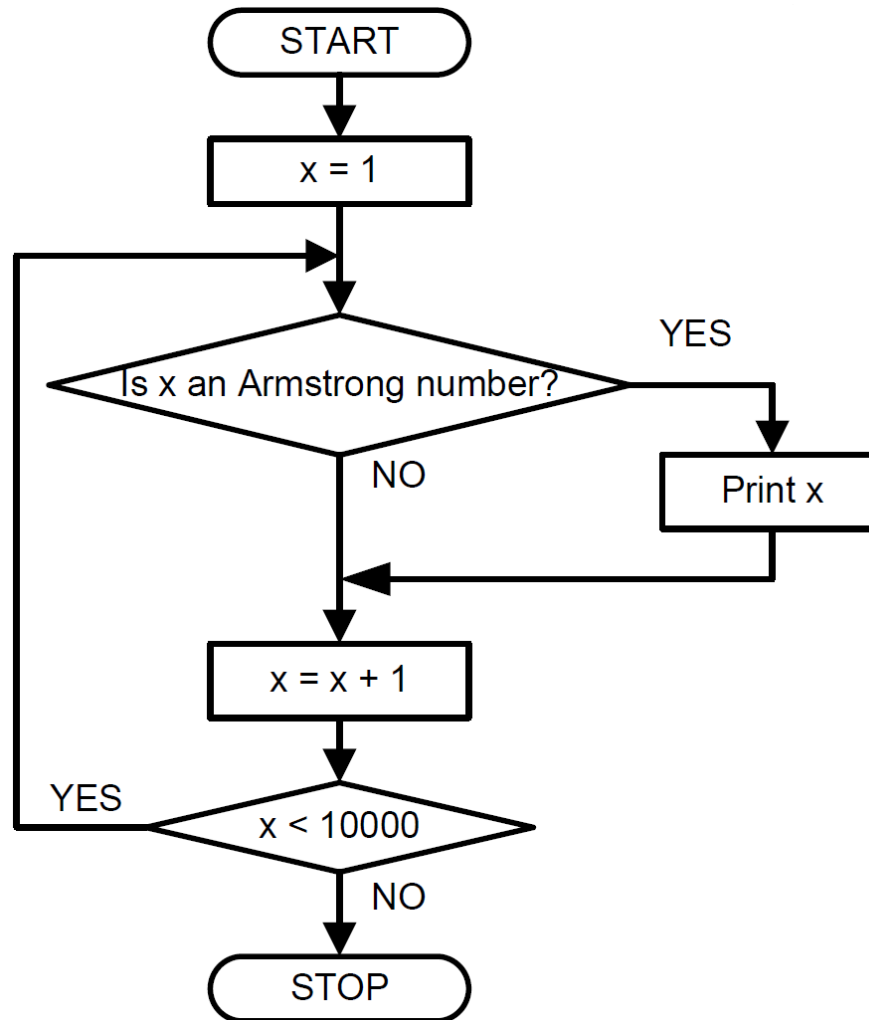
# Top-Down Design Example

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# Top-Down Design Example

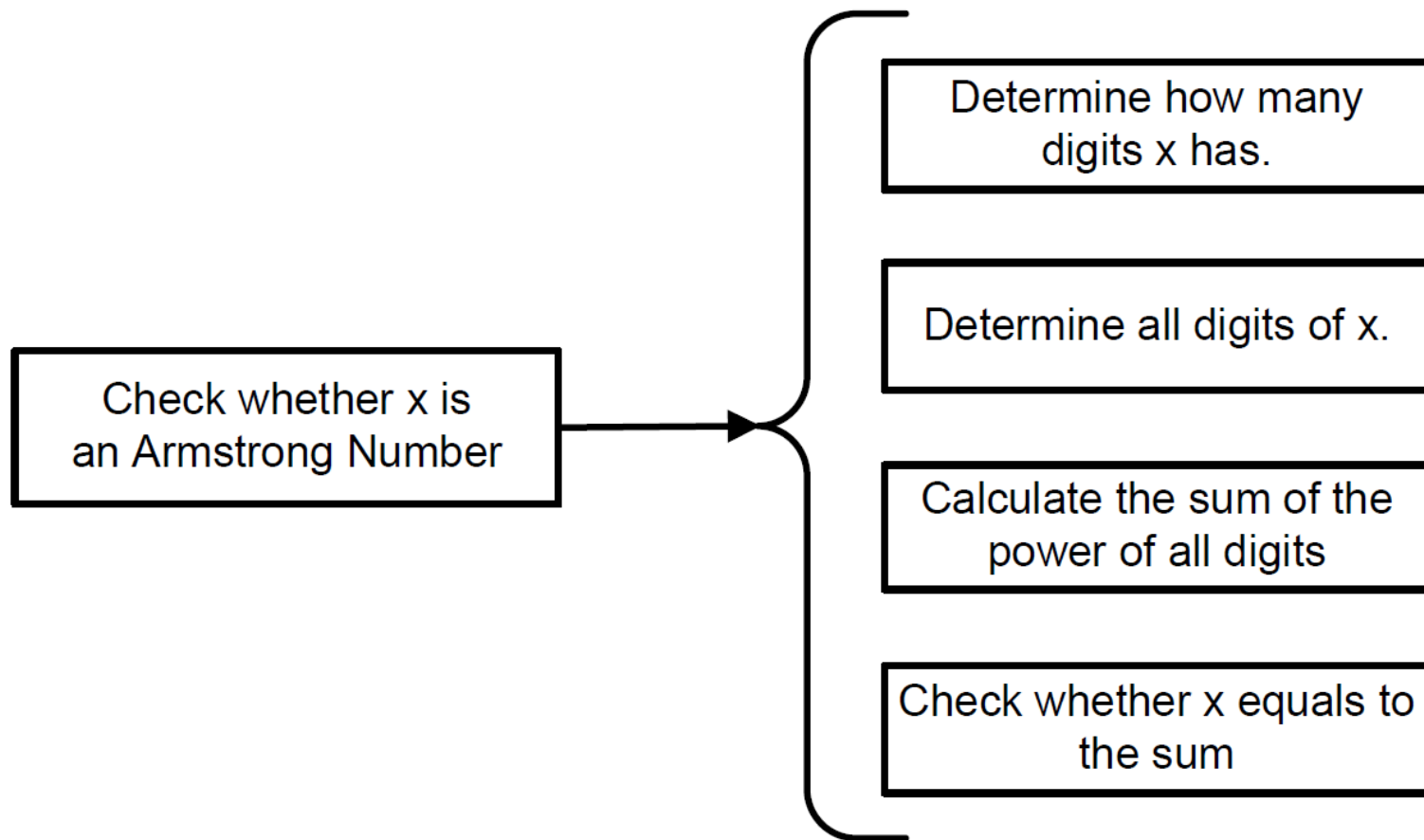
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# Top-Down Design Example

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# Top-Down Design Example: Counting digits

