Arithmetic Microoperations

Definition:
Arithmetic microoperations are basic operations performed on the numeric data stored in the registers of a computer's CPU. These operations are the fundamental steps the CPU uses to carry out arithmetic calculations at the hardware level[1] [2].

Types of Arithmetic Microoperations

1. **Addition**
   - Adds the contents of two registers and stores the result in a register.
   - Example: `R3 ← R1 + R2`

2. **Subtraction**
   - Subtracts the contents of one register from another and stores the result in a register.
   - Usually done by adding the two's complement of the subtracted value.
   - Example: `R3 ← R1 - R2`

3. **Increment**
   - Increases the value stored in a register by one.
   - Example: `R1 ← R1 + 1`

4. **Decrement**
   - Decreases the value stored in a register by one.
   - Example: `R1 ← R1 - 1`

5. **Multiplication**
   - Multiplies the contents of two registers.
   - Often implemented as repeated addition and shifting in hardware.

6. **Division**
   - Divides the value of one register by another.
   - Frequently achieved through repeated subtraction and shifting.

7. **Shift Operations**
   - Arithmetic shifting left or right can also be considered an arithmetic microoperation, especially when maintaining the sign bit in signed numbers[1].

In summary:
Arithmetic microoperations provide the essential building blocks for all mathematical processing

in a computer. They operate directly on registers, enabling the fast and efficient execution of basic arithmetic tasks like addition, subtraction, increment, and decrement, which are then used to implement more complex operations and algorithms [1] [2] .

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1. https://www.geeksforgeeks.org/computer-organization-architecture/arithmetic-micro-operations-in-registers/
2. https://vardhaman.org/wp-content/uploads/2021/03/CAO-Unit-I-part-3.pdf