# Dynamic Calculator - Simple Explanation

**By: 3rd Semester CS Student**

## What is this Calculator?

This is a simple calculator program in Python that can solve math problems with multiple operations. It follows the DMAS rule that we learn in math class (Division, Multiplication, Addition, Subtraction).

## How does it work?

### Step 1: Input Format

The calculator takes numbers and operators as separate inputs like this:

calculator(10, '+', 5, '\*', 2, '-', 3)

### Step 2: Separating Numbers and Operators

The program splits the input into two lists: - **Numbers list**: [10.0, 5.0, 2.0, 3.0]  
- **Operators list**: [‘+’, ’\*‘,’-’]

**Why?** Because we need to follow DMAS rule - first do multiplication/division, then addition/subtraction.

### Step 3: Handle Multiplication and Division First

while i < len(operators):  
 if op == '\*':  
 numbers[i] = a \* b # multiply two numbers  
 numbers.pop(i + 1) # remove second number  
 operators.pop(i) # remove the operator

**What happens?** If we find ’\*’ or ‘/’, we calculate it right away and update our lists.

Example: 5 \* 2 = 10, so we replace 5 and 2 with 10 in our numbers list.

### Step 4: Handle Addition and Subtraction

for i in range(len(operators)):  
 if operators[i] == '+':  
 result = result + numbers[i + 1]  
 elif operators[i] == '-':  
 result = result - numbers[i + 1]

**What happens?** After multiplication/division is done, we do addition and subtraction from left to right.

## Output Screenshot

Example 1:  
Result of this expression is: 17.0  
  
Example 2:  
Result of this expression is: 11.0  
  
Example 3:  
Result of this expression is: 90.0  
  
Example 4:  
Result of this expression is: 31.0

## Why this approach?

1. **DMAS Rule**: We follow the correct order of operations that we learned in math.
2. **Dynamic Input**: Can handle any number of operations.
3. **Simple Logic**: Easy to understand and modify.

## Example Calculation:

For calculator(10, '+', 5, '\*', 2, '-', 3): 1. First: 5 \* 2 = 10 → Lists become [10.0, 10.0, 3.0] and [‘+’, ‘-’] 2. Then: 10 + 10 = 20 3. Finally: 20 - 3 = 17.0

**Result: 17.0** ✓

This is how our calculator solves math problems step by step, just like we do in our notebooks!

*Note: This explanation is written in simple English as requested by a 3rd semester student learning programming.*