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Arithmetic through BASIC

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It may be emphasized that mathematical background may not be very important to use a computer or to write a program for a computer. However, we are to deal with numbers also guite frequently in programming. Let us discuss a few arithmetic operations that are important when programming in BASIC language.

We alrady have the impression that computer is a sophistucated calculator, and we can add and subtract numbers by using plus and minus signs:

```
PRINT 4 3
PRINT 12-7
PRINT 5 8-3 2-1
```

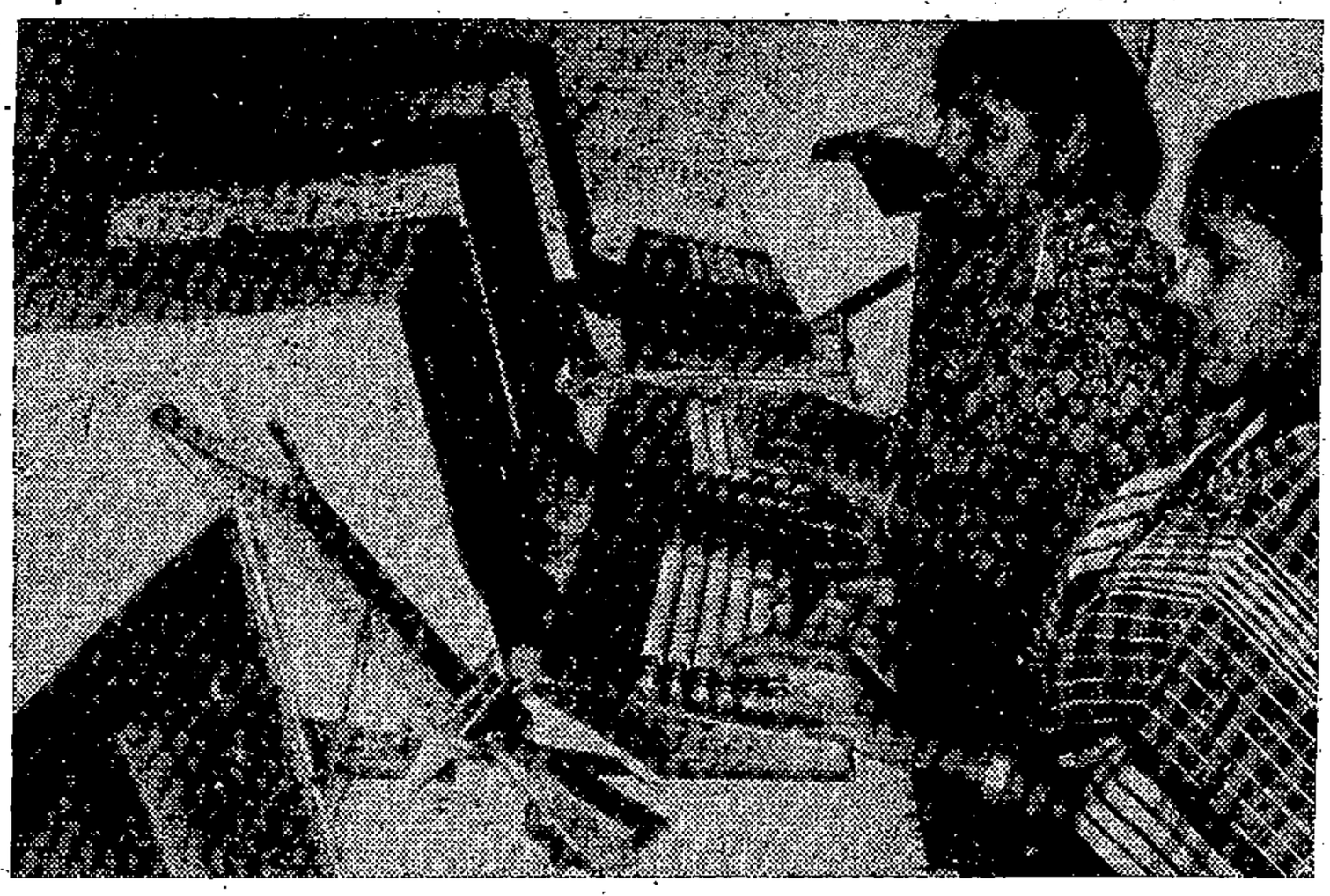
The above are few commands and it may be noticed that the numbers with and signs are written all on one line, and the computer will add or subtract from left to right.

It does not mean that computer can not do other operations like multiplication and division. Of course computer can performmultiplication and division also. To multiply asterisk symbol (0) is used. To divide the slash symbol (I) is used. We are to remember that everything has to be on one line. To multiply 3 times 4, the equation is represented by 3 4. similarly to divide 12 by 4 the equeation is written as 12/4.

Next important issue is the order of the operations, The standard rule is to calculate from left to right, first executing the multiplication and division, and them the addition and subtraction. If we have an equation like 8-12/4, the division 12/4 is performed first. The result thus obtained 3, is then added to 8 to get the final result 11.

Let us suppose we really wanted & added to 12 first, and then that sum divided by 4. On paper, we could write 8—12 as the numerator of a fraction : them under the bar, we write 4 to indicate division However, the expression should be written all one line with computers. Parentheses may be used in case of group members. But in that case we are to be sure that have always a matching pair of parenthesis. So for our example, we can write (8 12/4. This time the result is 20/4, or 5. In this way we night do lot of experiments with various experssions using all the operator signs and different placements of the parentheses in PRINT statements.

Now we may look into one more step in the order of operations which is operation concerning expo ents. Exponents are perfo ed before the multiplication and division operations. The exponention operator is an up arrow (1) on various micro computers in. Some micro computers use a carot symbol (v) in most of the cases. For example 5 4 3 10 starts with 4/3, which means 4 raised to the third power (cubed), or 64. The next operation is the multiplication 64. 10, or 640, the next operation is the addition 5 640 or 645, for the final result.



EXPRESSIONS WITH VARIABLES

We can try using numeric values when we are familiar in using actual numbers. A variable is simply a letter or name that represents a number. Those who are conversent with algebraic operations, would recall using letters in numeric experssions or formulae. As an example, A-L W is a formula for area equals length times width. When, we are to solve a problem we will have a number for L and number for W, which results in a number for A.

Let us explain this with the help of a sample program:

```
100 L—10
100 W—5
120 A—L 0 W
130 PRINT A
```

Line 120 performs the operation of multiplying the numbers represented by the variables L and W. Then line 130 prints the number represented by the variable A. If it is desired, we can delete line 120 and just use PRINT L0W for line 130. The rsult is the same.

The arithmetic symbols and order of operations are same for variables and constants.

(To be continued)