

| Category | Instruction | Syntactical Form | Example |
|---------------------|---------------------|---|---|
| INPUT/OUTPUT (I/O) | READ DISPLAY | READ <variable> DISPLAY <variable/constant> | READ height DISPLAY height |
| INITIALIZATION | SET | SET <variable> TO <variable/constant> | SET x TO 5 SET x TO z |
| COMPUTATION | COMPUTE | COMPUTE <variable> AS <expression> | COMPUTE area AS height*width |
| INCREMENT/DECREMENT | ADD SUBTRACT | ADD <variable/constant> TO <variable> SUBTRACT <variable/constant> FROM <variable> | ADD 1 TO x SUBTRACT 1 FROM x SUBTRACT x FROM y |
| BRANCHING | IF-THEN | IF <Boolean expression> THEN <statement if Boolean expression is true> ENDIF | IF temperature is above 90 THEN DISPLAY hot today ENDIF |
| | IF-THEN-ELSE | IF <Boolean expression> THEN <statement if Boolean expression is true> ELSE <statement if Boolean expression is false> ENDIF | IF temperature is above 90 THEN DISPLAY hot today ELSE DISPLAY not so hot day ENDIF |
| | NESTED IF-THEN-ELSE | IF <Boolean expression 1> THEN <statements if Boolean expression 1 is true> ELSE IF <Boolean expression 2> THEN <statements if Boolean expression 2 is true> ELSE <statements if Boolean expression 2 is false> ENDIF ENDIF | IF temperature is below 40 THEN DISPLAY cold day ELSE IF temperature is below 80 THEN DISPLAY mild day ELSE DISPLAY hot day ENDIF ENDIF |
| REPETITION | WHILE-END WHILE | WHILE <Boolean expression> <statements if Boolean expression is true> END WHILE | WHILE (n > 0) COMPUTE sum AS sum + n COMPUTE n AS n - 1 END WHILE |
| | DO-WHILE | DO <statements executed at least once> WHILE <expression> | DO COMPUTE n AS n - 1 WHILE (n > 0) |
| | REPEAT-UNTIL | REPEAT <statements> UNTIL <Boolean expression> | SET n AS 10 REPEAT COMPUTE n AS n + 1 UNTIL (n > 100) |
| | FOR-ENDFOR | FOR <iteration bounds> <statements> ENDFOR | FOR each day of the week DISPLAY day of the week ENDFOR |
| NESTED | NESTED-FOR | FOR <iteration bounds> FOR <iteration bounds> <statements> ENDFOR ENDFOR | FOR each day of the month FOR each day of the week DISPLAY day of the month + day of week ENDFOR ENDFOR |
| TERMINATE PROGRAM | HALT | HALT | HALT |

Definitions

<variable>: An entity that may change its value (e.g. x)

<constant>: A value that does not change (e.g. 4)

<expression>: A mathematical expression involving variables, constants and operators (e.g. $4*x + y + 4*5$)

<boolean expression>: An expression that is TRUE or FALSE (e.g. $n > 3$)

<statement>: One or more expressions in a program (e.g. SET x TO y + z)

Counting Operations

Count as one operation:

1. Each READ, SET, ADD, SUBTRACT, COMPUTE, DISPLAY statement.
2. Each comparison in a Boolean expression, e.g. **IF** x is 0 **OR** x is 20 **THEN** counts as two operations.
ELSE, **ENDIF**, **END WHILE**, **ENDFOR**, **REPEAT**, **HALT** do **NOT** count as operations.