

Manipulation of Data Part 1

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Expression

A valid sequence of operand(s) and operator(s) that reduces (or *evaluates*) to a single value.

Operator

A language-specific syntactical token (usually a symbol) that causes an action to be taken on one or more operands.

Operand

A value that receives the operator's action.

Precedence

Determines the order in which the operators are allowed to manipulate the operands.

Higher precedence goes first.

Associativity

Determines the order in which the operators of the same precedence are allowed to manipulate the operands.

Expression

$$2 + 3 * 4 + 5$$

Mark the Operator(s)
(using an exclamation point or line)

2 + 3 * 4 + 5

! ! !

Identify the Precedence

(using numbers with 1 being highest)

(multiplication is higher than addition)

$$2 + 3 * 4 + 5$$

! ! !

2 1 2

Identify Associativity
(using letters with a being first)
(addition is from left to right)

$$2 + 3 * 4 + 5$$

! ! !

$$2a \quad 1 \quad 2b$$

Evaluation

The process of applying the operators to the operands and resulting in a single value.

Evaluation – Step 1

(this changes to the next slide)

$$2 + 3 * 4 + 5$$

! ! !

2a 1 2b

Evaluation – Step 2

(this changes to the next slide)

$$2 + 12 + 5$$

! !

2a 2b

Evaluation – Step 3

(this changes to the next slide)

$$14 + 5$$

!

2b

Evaluation – Done

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Parentheses

Change the order of evaluation in an expression. You do what's in the parentheses first.

Evaluation

(with parentheses – example 1)

$$(2 + 3) * (4 + 5)$$

! ! !

1a 2 1b

Evaluation

(with parentheses – example 2)

$$(2 + 3) * 4 + 5$$

! ! !

1 2 3

The End