

Sheet3 - Prolog arithmetic expression

Arithmetic expression

addition	+
multiplication	*
subtraction	-
division	/
power	^
mod	mod

In prolog 'is' has a special functionality in evaluating arithmetic expressions. But with condition that the expression should be on the right side of 'is' otherwise it will give an error.

On Prolog Query Prompt :

?- X is 3+2. // expression on right side of 'is'
X = 5.

?- 3+2 is X. // expression on left side of 'is'
ERROR: is/2: Arguments are not sufficiently instantiated

?- X = 3+2. // just instantiate variable X to value 3+2
X = 3+2.

?- 3+2 = X.
X = 3+2.

?- X is +(3,2).
X = 5.

?- 5 is 3+2.
True

How does Prolog answer to below Queries

1. ?- 3+2 is 5.
2. ?- X is 3*2.
3. ?- X is 3-2.
4. ?- X is -(5,3,1).
5. ?- X is -(5,3,1).
6. ?- X is 5-3-1.

Answer

- [1] false.
- [2] X = 6.
- [3] X = 1.
- [4] ERROR: is/2: Arithmetic: `(-)/3' is not a function
- [5] X = 1.
- [6] X = 1.

Extra Questions:

1. ?- X is 3/5.
2. ?- X is 3 mod 5.
3. ?- X is 5 mod 3.
4. ?- X is 5^3.
5. ?- X is (5^3)^2.
6. ?- X = (5^3)^2.
7. ?- 25 is 5^2.
8. ?- Y is 3+2*4-1.
9. ?- Y is (3+2)*(4)-(1).
10. ?- Y is -(+(3,2),4),1).
11. ?- X is 3*2, Y is X*2.

Answer

1. X = 0.6.
2. X = 3.
3. X = 2.
4. X = 125.
5. X = 15625.
6. X = (5^3)^2.
7. true.
8. Y = 10.
9. Y = 19.
10. Y = 19.
11. X = 6,
Y = 12.