

*Lecture four:**Content*

- 1. Data type.*
- 2. Program structure.*
- 3. Read and write functions.*
- 4. Arithmetic and logical operation.*

1. data type

Prolog supports the following data type to define program entries.

1. **Integer:** to define numerical value like 1, 20, 0,-3,-50, ect.
2. **Real:** to define the decimal value like 2.4, 3.0, 5,-2.67, ect.
3. **Char:** to define single character, the character can be of type small letter or capital letter or even of type integer under one condition it must be surrounded by single quota. For example, 'a','C','123'.
4. **string :** to define a sequence of character like "good" i.e define word or statement entries the string must be surrounded by double quota for example "computer", "134", "a". The string can be of any length and type.
5. **Symbol:** another type of data type to define single character or sequence of character but it must begin with small letter and don't surround with single quota or double quota.

2. program structure

Prolog program structure consists of five segments, not all of them must appear in each program. The following segment must be included in each program predicates, clauses, and goal.

1. **Domains:** define global parameter used in the program.

Domains

I= integer

C= char

S = string

R = real

2. **Data base:** define internal data base generated by the program

Database

Greater (integer)

3. **Predicates:** define rule and fact used in the program.

Predicates

Mark(symbol,integer).

4. **Clauses:** define the body of the program.. For the above predicates the clauses portion may contain Mark (a, 20).

5.**Goal:** can be internal or external, internal goal written after clauses portion , external goal supported by the prolog compiler if the program syntax is correct

This portion contains the rule that drive the program execution.

2. mathematical and logical operation

a .mathematical operation:

operation	symbol
addition	+
subtraction	-
multiplication	*
Integer part of division	div
Remainder of division	mod

B .logical operation

operation	symbol
greater	>
Less than	<
Equal	=
Not equal	<>
Greater or equal	>=
Less than or equal	<=

3. Other mathematical function

Function name	operation
Cos(X)	Return the cosine of its argument
Sine(X)	Return the sine of its argument
Tan(X)	Return the tranget of its argument
Exp(X)	Return e raised to the value to which X is bound
Ln(X)	Return the natural logarithm of X (base e)
Log(X)	Return the base 10 logarithm of log 10^x
Sqrt(X)	Return the positive square of X
Round(X)	Return the rounded value of X. Rounds X up or down to the nearest integer
Trunc(X)	Truncates X to the right of the decimal point
Abs(X)	Return the absolute value of X

4. Read and write function

Read function:

readint(Var) : read integer variable.

Readchar(Var) : read character variable.

Readreal(Var) : read read (decimal) variable.

Readln(Var) : read string.

Write function

Write(Var) : write variable of any type.

Example 1: write prolog program to read integer value and print it.