

Lab 1: Introduction to Prolog: Basic Syntax and Queries

Objective: Understand the basic syntax of Prolog and how to write simple facts and rules.

Theory/Concepts: Prolog is a declarative programming language often used in Artificial Intelligence for knowledge representation and reasoning. It is based on logic programming, where the program is written as a set of facts and rules, and the system infers answers by querying these facts and applying the rules.

- Facts: Basic statements about the world. For example, likes(john, pizza). means "John likes pizza."
- Rules: Logical statements that define relationships between facts. For example, friends(X, Y) :- likes(X, Y), likes(Y, X). means "X and Y are friends if X likes Y and Y likes X."
- Queries: Requests to the system for information. For example, ?- likes(john, pizza). asks whether John likes pizza.

Materials and Tools:

- Software: SWI-Prolog, Text editor (e.g., Notepad)
- Operating System: Windows 10

Code Implementation:

```
% Define facts
```

```
likes(john, pizza).
```

```
likes(mary, burger).
```

```
likes(john, mary).
```

```
% Define rules
```

```
friends(X, Y) :- likes(X, Y), likes(Y, X).
```

```
% Query 1: Check if John likes pizza
```

```
?- likes(john, pizza).
```

```
% Query 2: Check if John and Mary are friends
```

```
?- friends(john, mary).
```

Results:

The following results were obtained after running the above queries in SWI-Prolog:

Query 1: ?- likes(john, pizza).

Result: true

Query 2: ?- friends(john, mary).

Result: false