

ARTIFICIAL INTELLIGENCE

LAB 1

AIM: Study of Facts, Objects, Predicates and Variables.

Sample Program:

Code:

```
domains
    disease, indication=symbol
predicates
    symptom (disease, indication)
clauses
    symptom(chicken_pox,high_fever).
    symptom(chicken_pox,chills).
    symptom(flu,chills).
    symptom(cold,mild_body_ache).
    symptom(flu,severe_body_ache).
    symptom(cold,runny_nose).
    symptom(flu,runny_nose).
    symptom(flu,moderate_cough).
```

Questions:

1. Goal: symptom(cold,runny_nose)

```
Goal: symptom(cold,runny_nose)
Yes
Goal: _
```

2. Goal: symptom(_,chills)

```
Goal: symptom(_,chills)
Yes
Goal: ►
```

3. Goal: symptom(Disease,runny_nose)

```
Goal: symptom(Disease,runny_nose)
Disease=cold
Disease=flu
2 Solutions
Goal: _
```

4. Goal: symptom(Disease, mild_body_ache) and symptom(Disease,runny_nose)

```
Goal: symptom(Disease,mild_body_ache) and symptom(Disease,runny_nose).
Disease=cold
1 Solution
Goal:
```

5. Add symptom(flu, mild_body_ache) in existing database 7 run following goal

Goal: symptom(Disease,mild_body_ache), symptom(Disease,runny_nose)

```
Goal: symptom(Disease,mild_body_ache),symptom(Disease,runny_nose).
Disease=cold
Disease=flu
2 Solutions
```

EXERCISE:

1. Write a prolog program for the following facts.

- i. Colour of b1 is red
- ii. Colour of b2 is blue
- iii. Colour of b3 is yellow
- iv. Shape of b1 is square
- v. Shape of b2 is circle
- vi. Shape of b3 is square
- vii. Size of b1 is small
- viii. Size of b2 is small
- ix. Size of b3 is large

Code:

```
domains
    component, parameter=symbol
predicates
    colour(component,parameter)
    shape(component,parameter)
    size(component,parameter)
clauses
    colour(b1,red).
    colour(b2,blue).
    colour(b3,yellow).
    shape(b1,square).
    shape(b2,circle).
    shape(b3,square).
    size(b1,small).
    size(b2,small).
    size(b3,large).
```

Questions:

- 1) What is the shape of b3?

```
Goal: shape(b3,X)
X=square
1 Solution
```

2) Which component is having large size and yellow color?

```
Goal: size(X,large),colour(X,yellow).  
X=b3  
1 Solution
```

2. Give answer from the given clauses.

Code:

```
domains  
    X,Y=symbol  
predicates  
    likes(X,Y)  
clauses  
    likes(mary,food).  
    likes(mary,wine).  
    likes(john,wine).  
    likes(john,mary).
```

1) likes(mary,food)

```
Goal: likes(mary,food).  
Yes
```

2) likes(john,wine)

```
Goal: likes(john, wine).  
Yes
```

3) likes(john,food)

```
Goal: likes(john, food).  
No
```

4) John likes anything that Mary likes

```
Goal: likes(john,_),likes(mary,_).  
Yes
```

5) John likes anyone who likes wine

```
Goal: likes(john,X),likes(Y,wine),X=Y.  
X=mary, Y=mary  
1 Solution
```

3. Give answers from the given clauses.

Code:

```
domains  
    X,Y,Z=symbol  
predicates  
    has(X,Y)  
    fruit(Z)  
clauses  
    has(jack,apples).  
    has(ann,plums).  
    has(dan,money).  
    fruit(apples).  
    fruit(plums).
```

1) what Jack has?

```
Goal: has(jack,A).  
A=apples  
1 Solution
```

2) Does Jack have something?

```
Goal: has(jack,_).  
Yes
```

3) Who has apples and Who has plums?

```
Goal: has(X,apples),has(Y,plums).  
X=jack, Y=ann  
1 Solution
```

- 4) Does someone have apples and plums?

```
Goal: has(X,apples),has(X,plums).  
No Solution
```

- 5) Has Dan fruits?

```
Goal: has(dan,X),fruit(Y),X=Y.  
No Solution
```