

# **ARTIFICIAL INTELLIGENCE SESSIONAL**

**Course Code: CSE 4111**

## **LAB REPORT**

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# Experiment No. 1

**Title:** Arithmetic Operations Using Python

**Objective:** To perform addition, subtraction, multiplication, and division using Python.

**Algorithm:**

1. Input two numbers.
2. Apply arithmetic operators.
3. Display results.

**Program:**

```
a = int(input("Enter first number: "))
b = int(input("Enter second number: "))

print("Addition =", a + b)
print("Subtraction =", a - b)
print("Multiplication =", a * b)
print("Division =", a / b)
```

**Output:**

```
Enter first number: 10
Enter second number: 5
Addition = 15
Subtraction = 5
Multiplication = 50
Division = 2.0
```

**Conclusion:** Arithmetic operations were successfully performed using Python.

## Experiment No. 2

**Title:** Arithmetic Operations Using Prolog

**Objective:** To perform subtraction and multiplication using Prolog.

**Program:**

```
subtract(A,B,R) :- R is A-B.  
multiply(A,B,R) :- R is A*B.
```

**Output:**

```
?- subtract(10,5,R).  
R = 5.  
  
?- multiply(4,3,R).  
R = 12.
```

**Conclusion:** Prolog successfully handled arithmetic operations.

## Experiment No. 3

**Title:** Addition of Two Numbers Using Prolog

**Objective:** To add two numbers using Prolog.

**Program:**

```
add(A,B,R) :- R is A+B.
```

**Output:**

```
?- add(5,7,R).  
R = 12.
```

**Conclusion:** Addition was implemented successfully.

## Experiment No. 4

**Title:** Sum of Elements in a List Using Prolog

**Objective:** To calculate sum of list elements.

**Program:**

```
sumlist([],0).  
sumlist([H|T],S):- sumlist(T,S1), S is H+S1.
```

**Output:**

```
?- sumlist([1,2,3,4,5],S).  
S = 15.
```

**Conclusion:** Recursive list processing was achieved.

## Experiment No. 5

**Title:** Reverse a Number Using Python

**Objective:** To reverse a given number.

**Program:**

```
n = int(input("Enter number: "))
rev = 0
while n > 0:
    rev = rev*10 + n%10
    n = n//10
print("Reversed number=", rev)
```

**Output:**

```
Enter number: 1234
Reversed number = 4321
```

**Conclusion:** Number reversal was successful.

## Experiment No. 6

**Title:** FOL Conversion and Prolog Implementation

**Objective:** To represent facts and rules using Prolog.

**Facts and Rules:**

```
likes(sakib, football).  
likes(sabbir, fruits).  
likes(sabbir, X):- likes(_, football).  
likes(sakib, X):- likes(sabbir, X).
```

**Query and Output:**

```
?- likes(sakib, X).  
X = fruits.
```

**Conclusion:** Logical reasoning was successfully implemented.

## Experiment No. 7

**Title:** Family Relationship Representation Using Prolog

**Objective:** To represent family relations.

**Facts:**

```
brother(rashid, tamim).  
man(rashid).  
woman(champa).
```

**Queries and Output:**

```
?- man(X).  
X = rashid.  
  
?- woman(X).  
X = champa.
```

**Conclusion:** Family relations were modeled correctly.

## Experiment No. 8

**Title:** ELIZA Chatbot Implementation

**Objective:** To simulate human conversation.

**Program:**

```
response("hello","Hello! How are you?").  
response("sad","Why are you feeling sad?").  
response("bye","Goodbye!").
```

**Sample Interaction:**

```
User: hello  
Bot: Hello! How are you?
```

**Conclusion:** A simple ELIZA chatbot was successfully implemented.