Artificial Intelligence

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Lab Assignment 3

1. Which functions are used to take input and show output in PROLOG? Write a program to input your name from the keyboard and display it on screen.

Solution:

```
rnw :-
        write('Enter your name: '),
        read(User), process(User).
process(User) :-
        write('Your name as per you is : '),
        write(User).
```

2. Write a PROLOG program for solving the following:

i) Implement a Menu Driven Calculator having functionalities like: Addition, Subtraction, Multiply, Divide. Take two variables, input it from the keyboard then display the result in third variable on screen.

Solution:

```prolog
readUser :-
        write('Choose from the following: '),nl,
        write('1. Addition'),nl,
        write('2. Subtraction'),nl,
        write('3. Multiplication'),nl,
        write('4. Division'),nl,
        read(UserOP),
        write('Enter first operand:'),
        read(User1),
        write('Enter second operand:'),
        read(User2),
        calculator(UserOP, User1, User2).

calculator(Op,X,Y) :-
        Op =:= 1,
        Ans is X + Y,
        write(Ans).

calculator(Op,X,Y) :-
        Op =:= 2,
        Ans is X - Y,
        write(Ans).

calculator(Op,X,Y) :-
        Op =:= 3,
        Ans is X * Y,
        write(Ans).
```

```
calculator(Op,X,Y) :-
        Op =:= 4,
        Ans is X / Y,
        write(Ans).
```

ii) Find maximum and minimum of 3 numbers, read numbers from keyboard.

Solution:

```prolog
readUser :-
        write('Enter first number:'),nl,
        read(User1),
        write('Enter second number:'),nl,
        read(User2),
        write('Enter third number:'),nl,
        read(User3),
        calMax(User1, User2, User3),
        calMin(User1, User2, User3).


calMax(X,Y,Z) :-
        X > Y, X > Z,
        Ans is X,
        write('The maximum of three is : '),
        write(Ans),nl.


calMax(X,Y,Z) :-
        Y > X, Y > Z,
        Ans is Y,
        write('The maximum of three is : '),
        write(Ans),nl.


calMax(X,Y,Z) :-
        Z > X, Z > Y,
        Ans is Z,
        write('The maximum of three is : '),
        write(Ans),nl.


calMin(X,Y,Z) :-
        X < Y, X < Z,
        Ans is X,
        write('The minimum of three is : '),
        write(Ans),nl.
```

```prolog
calMin(X,Y,Z) :-
        Y < X, Y < Z,
        Ans is Y,
        write('The minimum of three is : '),
        write(Ans),nl.

calMin(X,Y,Z) :-
        Z < Y, Z < X,
        Ans is Z,
        write('The minimum of three is : '),
        write(Ans),nl.
```

readUser

Enter first number:

5

Enter second number:

2

Enter third number:

7

The maximum of three is : 7

The minimum of three is : 2

true

| Next | 10 | 100 | 1,000 | Stop |

?-   readUser

iii) A traffic signal system has rules as follows:

a. ODD date number plate vehicles are eligible for Monday, Wednesday and Friday.

b. EVEN number plate vehicles are eligible for Tuesday, Thursday and Saturday.

c. On Sunday all vehicles are eligible for running in traffic. Read a vehicle number from the keyboard & display its eligible days.

Solution:

```
readUser :-
        write('Number plate :'),nl,
        read(UserInput),
        days(UserInput).

days(X) :-
        X mod 2 =:= 1,
        write('Monday, Wednesday, Friday, Sunday.'),nl.

days(X) :-
        X mod 2 =:= 0,
        write('Tuesday, Thursday, Saturday, Sunday.'),nl.
```

readUser

Number plate :

1234

Tuesday, Thursday, Saturday, Sunday.

true

readUser

Number plate :

1243

Monday, Wednesday, Friday, Sunday.

true

| Next | 10 | 100 | 1,000 | Stop |

?- `readUser`