Lab 4 – 08226 Artificial Intelligence

This lab tutorial will introduce you to input and output in your Prolog programs, and then introduces you to the use of the anonymous variable.

1.0 Write

Start SWI-Prolog-Editor from the Windows Menu system and create a new Prolog file called **Lab4.pl** and store it in **G:/08226/Lab 4/**.

Consider the following rule:

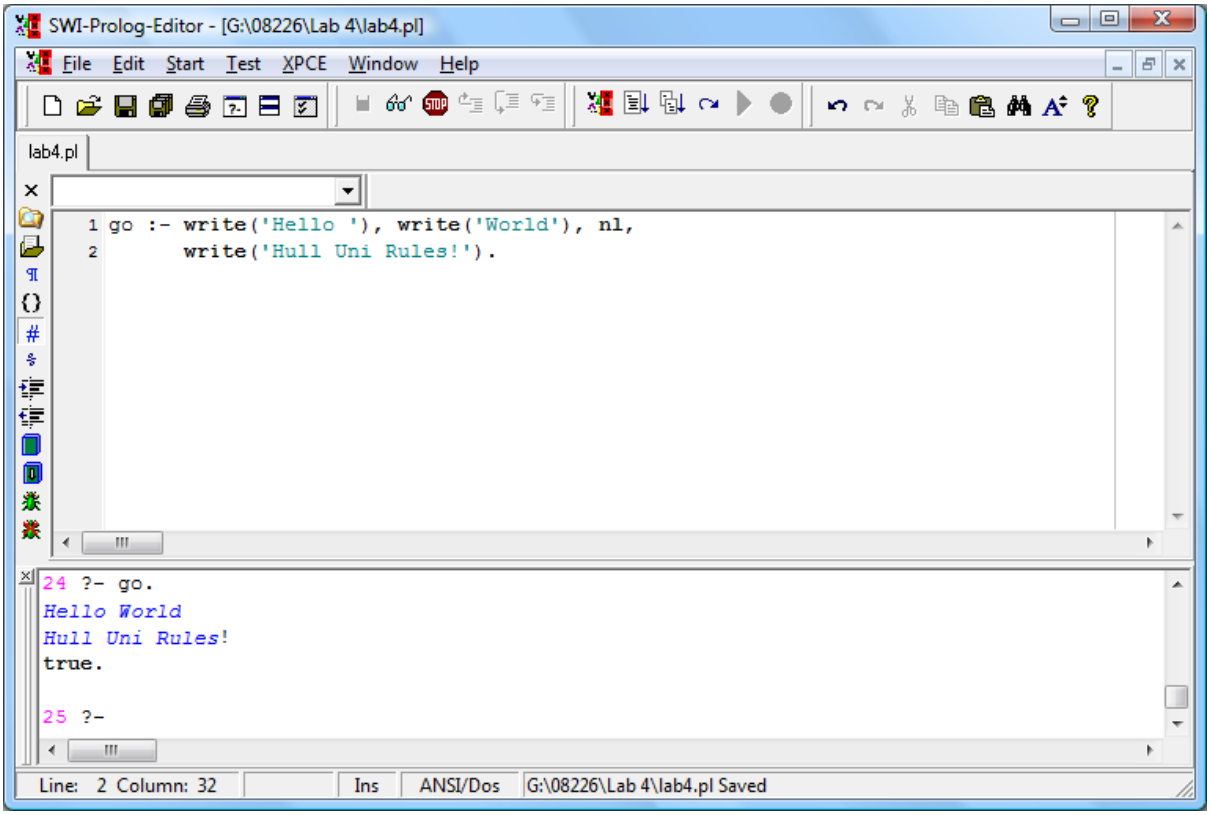
```
go :- write('Hello '), write('World'), nl,
      write('Hull Uni Rules!').
```

The **predicate** (keyword) **write** will output some text to the query window. The predicate **nl** will move the cursor's position to the next line so it acts as a carriage return. Enter the above code into your program and then select **consult**.

Enter the following query

```
?- go.
```

You should see the following:



2.0 Read

Consider the following rule:

```
go :- write('Enter Your Name: '),
      read(Yourname),
      write('Hello '), write(Yourname), nl.
```

The predicate **read** will input a value from the user in the query window. The value can be a number or text. Enter the above code into your program and then select **consult**.

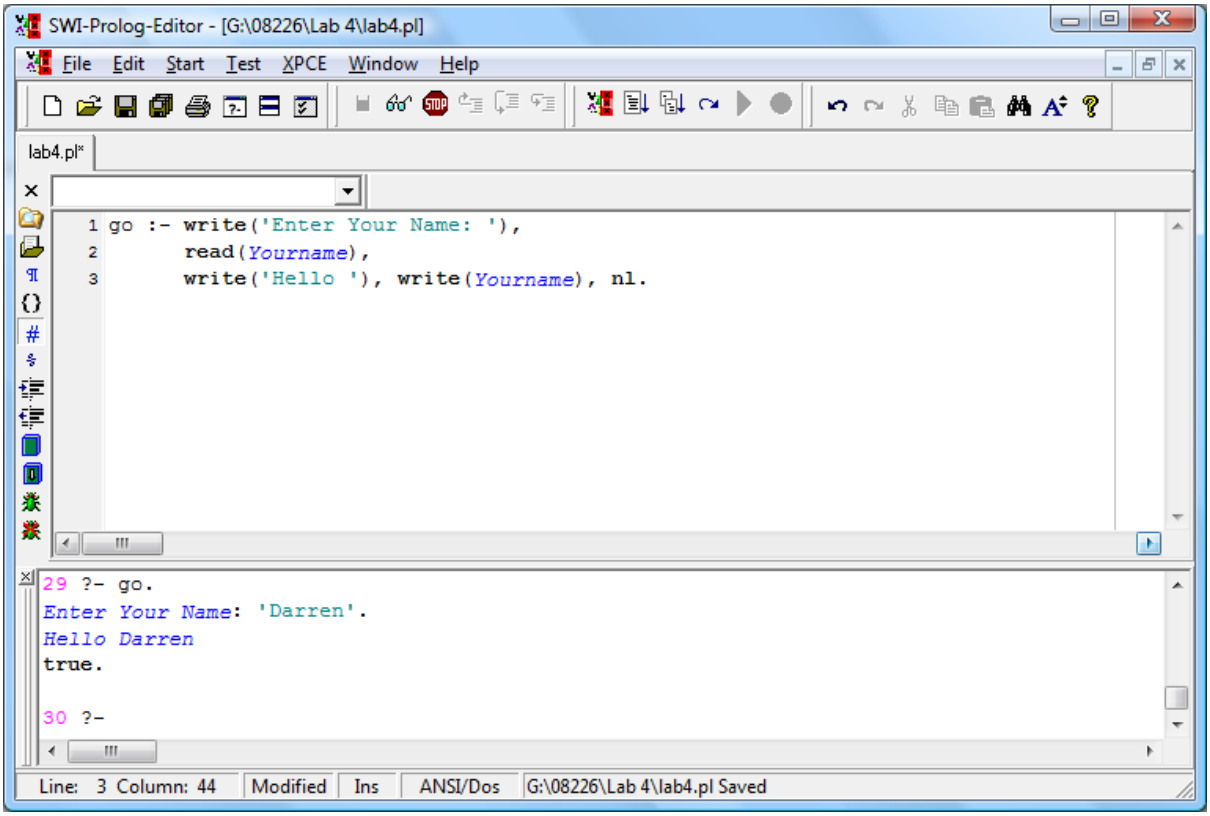
Enter the following query

```
?- go.
```

When you are asked for your name encapsulate it in quotes (we do this to tell Prolog we are inputting text, otherwise it will assume that we are inputting a number), and also remember to follow it be a full stop, e.g.

```
29 ?- go.
Enter Your Name: 'Darren'.
```

Then you should be presented with something similar to:



2.1 IO Exercise 1

Write a Prolog program using facts in the form **month/1** that displays the month depending on the integer entered by the user, e.g. if the user enters **3** the program will display **The Month is March**.

Check your answer here: **IO Exercise 1 Answer**

3.0 Anonymous Variable

The answer to IO Exercise 1 could get into trouble if the user enters a value other than 1 to 12. Therefore we could do with a default rule that would be called for any other value other than 1 to 12.

We can use the anonymous variable, which is the underscore **_**.

Therefore we can add the following line to our answer for IO Exercise 1:

```
month(_) :- write('Invalid Value').
```

The anonymous variable can be used both in your program and in a query. Consider the following program:

```
food(apple,fruit).      /* apple is a fruit */

food(tomato,fruit).     /* tomato is a fruit */

food(lettuce,salad).    /* lettuce is a salad */

food(beef,meat).        /* beef is a meat */
```

We are going to ask Prolog what foods it has.

```
?- food(Food_name,_).
```

The above query will produce the following result:

```
Food_name = apple ;

Food_name = tomato ;

Food_name = lettuce ;

Food_name = beef.
```

Therefore by using the anonymous variable we are telling Prolog that we are not interested in the second argument of the food rule.

3.1 IO Exercise 2

Given the following matrix, write a Prolog program using facts in the form **translate/2** that displays a translated word from English to French entered by the user, e.g. if the user enters **you** the program will display **In French, the word you is vous**. Also make sure that your program handles any unknown inputs.

English	French
you	vous
i	je
the	le
house	maison
now	maintenant

Check your answer here: **IO Exercise 2 Answer**

4.0 IO Exercise 1 Answer

Write a Prolog program using facts in the form **month/1** that displays the month depending on the integer entered by the user, e.g. if the user enters **3** the program will display **The Month is March**.

```
go :- write('Enter a month as an integer: '),
      read(Month),
      write('The Month is '), month(Month), nl.


month(1) :- write('January').
month(2) :- write('February').
month(3) :- write('March').
month(4) :- write('April').
month(5) :- write('May').
month(6) :- write('June').
month(7) :- write('July').
month(8) :- write('August').
month(9) :- write('September').
month(10) :- write('October').
month(11) :- write('November').
month(12) :- write('December').
```

Return to your exercise here: **IO Exercise 1**

5.0 IO Exercise 2 Answer

Given the following matrix, write a Prolog program using facts in the form **translate/2** that displays a translated word from English to French entered by the user, e.g. if the user enters **you** the program will display **In French, the word you is vous**. Also make sure that your program handles any unknown inputs.

English	French
you	vous
i	je
the	le
house	maison
now	maintenant

```
translate(you,vous).

translate(i,je).

translate(the,le).

translate(house,maison).

translate(now,maintenant).

translate(_,'NOT KNOWN').


go :- write('Enter an English word: '),
      read(English), nl,
      translate(English,French),
      write('In French, the word '), write(English),
      write(' is '), write(French).
```

Return to your exercise here: **IO Exercise 2**