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Admission no.: U19CS009

ARTIFICIAL INTELLIGENCE - ASSIGNMENT -3

Use SWI – Prolog for answering the following questions (load the rules in the file familytree.pl):

1. Is Albert a parent of Peter?

```
?- %Is Albert a parent of Peter?
|    parent('albert','peter').
true .
```

2. Who is the child of Jim?

```
?- %Who is the child of Jim?
|    parent('jim',X).
X = brian.
```

3. Who are the parents of Brian?

```
?- %Who are the parents of Brian?
|    findall(X,parent(X,'brian'),B).
B = [jim, pat].

?- %Parents of brian are : jim and pat.
|    true.
true.
```

4. Is Irene a grandparent of Brian?

```
?- %Is Irene a grandparent of Brian?
|    parent('irene',X),parent(X,'brian').
X = jim .

?- %Here X has a value,Jim, so it means Irene is grandparent of Brian.
|    true
|    .
true.
```

Yes, Irene is a grandparent of Brian.

5. Find all the grandchildren of Irene.

```
?- %Find all the grandchildren of Irene.
|    findall(Y,(parent('irene',X),parent(X,Y)),B).
B = [brian, lee, sandra, james, kate, kyle].

?- %Here all memebers of B are grandchildren of irene.
|    true.
true.
```

6. Now add the following rule to familytree.pl and re-consult:

older(Person1, Person2) :- yearOfBirth(Person1, Year1), yearOfBirth(Person2, Year2), Year2 > Year1.

7. Who is older than Pat?

```
?- consult('u19cs009-ai-assign01-family-tree.pl').
true.

?- %Who is older than Pat?
|    findall(X,older(X,'pat'),B).
B = [irene, albert, jim, peter].

?- %Here members of B are older than pat.
|    true.
true.
```

8. Who is younger than Darren?

```
?- %Who is younger than Darren?
|    findall(X,older('darren',X),B).
B = [jenny, amanda].

?- %Here all the members of B are younger than darren.
|    true.
true.
```

9. List the siblings of Sandra.

```
?- %List the siblings of Sandra.
|    findall(Y,(parent(X,'sandra'),parent(X,Y)),B).
B = [lee, sandra, james, kate, kyle].

?- %Here all the members of B are siblings of sandra.
|    true.
true.
```

10. Who is the older brother of Sandra?

```
?- %Who is the older brother of Sandra?
|    findall(Y,(parent(X,'sandra'),parent(X,Y),older(Y,'sandra'),male(Y)),B).
B = [james].

?- %Here James is the brother of sandra who is older than her.
|    true.
true.
```

11. Find the predecessors of Kyle.

```
?- %Find the predecessors of Kyle.
|    findall(X,predecessor(X,'kyle'),B).
B = [peter, albert, irene].

?- %Predecessor of Kyle are listed in B.
|    true.
true.
```

12. Does Kate have a sister?

```
?- %Does Kate have a sister?
|    findall(Y,(parent(X,'kate'),parent(X,Y),female(Y),Y\=='kate'),B).
B = [lee, sandra].

?- %Kate's sisters are : Lee and Sandra.
|    true.
true.
```

13. How many females and males are there in the knowledge base?

```
?- %How many females and males are there in the knowledge base?
|    %Number of males are :
|    countMales(X).
X = 8.

?- %How many females and males are there in the knowledge base?
|    %Number of females are :
|    countFemales(X).
X = 7.

?- ^C
Action (h for help) ? exit (status 4)
brijesh@brijesh-GF75-Thin-9SCSR:~/Documents/ai/ai-assign02$
```