COSC 4368: Artificial Intelligence Spring 2018

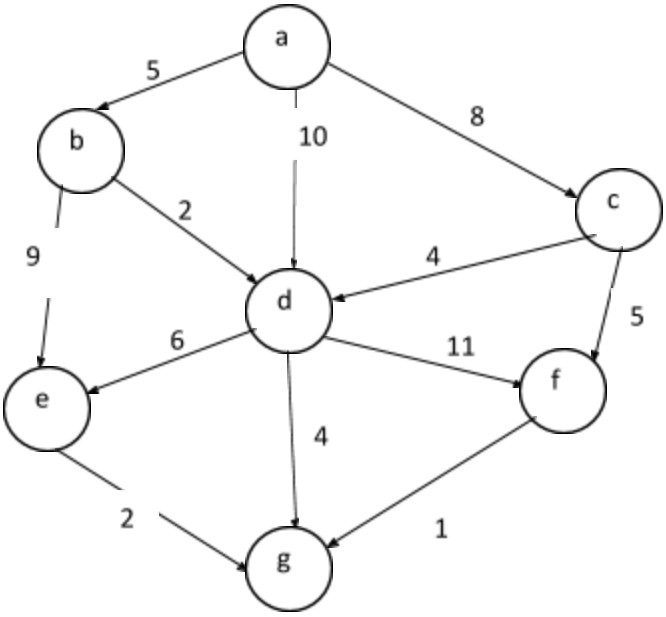
Homework # 2:

Assigned Feb 21, 2018, **Due** March 2, 2018 (midnight)

Team Work
Students can form a team of up to 2 persons to do this homework.

Consider the following directed graph.
Enter all the edges between two nodes in the graph and the length of the edge as *facts* using the **connect** predicate. (The number next to each edge shows the length of that edge). Some examples for nodes **a** and **d** are as follows:

```
connect(a,b,5)
connect(a,d,10)
connect(d,c,4)
connect(d,e,6)
connect(d,f,11)
connect(d,g,4)
```



Write the necessary Prolog code as *rules* to answer the following questions (add them to the knowledge base):

i. Find all the paths between any two nodes in the graph with the total length of the path.
Example:

```
?- path(a,g,Length,Path).
Length = 11,
Path = abdg ;
Length = 15,
Path = abdeg ;
Length = 19,
Path = abdfg ;
Length = 16,
Path = abeg ;
Length = 14,
Path = adg ;
Length = 18,
Path = adeg ;
Length = 22,
Path = adfg ;
Length = 14,
Path = acfg ;
Length = 16,
Path = acdg ;
Length = 20,
Path = acdeg ;
Length = 24,
Path = acdfg ;
```

ii. Find the length of any given path.
Example:

```
?-pathLength([a,b,e,g],Length).
Length = 16 .
```

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You might need to use the following in-built rule in your code:

atom_concat(*Atom1, Atom2, Atom3*)

atom_concat forms the concatenation of Atom1 and Atom2 and puts it in Atom3.

Example:

```
?- A='Second ',

B='Homework',

atom_concat(A,B,C).

C = 'Second Homework'.
```

What you need to deliver:

Each team needs to deliver one source code.
The source code must be in SWI-Prolog. The source code should have enough comments to clarify what has been done in sections (i) and (ii).

Please do not send anything other than your source code. It could be in .txt or .pl format.
Please note that not following the proper instructions will result in loss of marks.