BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI
HYDERABAD CAMPUS
CS F407: Artificial Intelligence

Assignment No: 2 **Total Marks: 30** **Submission Date: 30.4.22**

1. Problem 1:

The goal of this problem is to expose you to the task of modeling real world knowledge by applying the knowledge representation concepts learnt in the course, and their inferencing techniques.

Overview:

If an honest politician has given a promise he keeps the promise. If a party has given a promise, and a person is a leader of the party, then that means the party has given a promise. If the person keeps his promise and he is the leader of the party then the party keeps its promise. If a person is the leader of a party then the person is a politician. Party ABCD makes a promise P1. ABCD did not keep the promise P1. The leader of the party ABCD is XYZ . XYZ is a person

You need to do the following steps:

- Design the knowledge representation scheme for the above knowledgebase.
- Convert the knowledge base into an FOPL model.
- Use a tool or write a program to implement the same.

[10 Marks]

2. Problem 2 :

AI researchers have developed several Expert System shells for the development of Expert systems. These shells are empty Expert System knowledge bases, which have the structure and interface already written for you; all you need to do is to add the knowledge into the KB. Instead of writing an Expert System from scratch, for this problem you will be using a small Expert System shell to design and implement an expert system. You may use PyKnow Framework for building the concerned expert system.

Design a Career Expert System that can recommend the set of courses a student needs to take over a period of 4 years that can land him into an IT job or a research

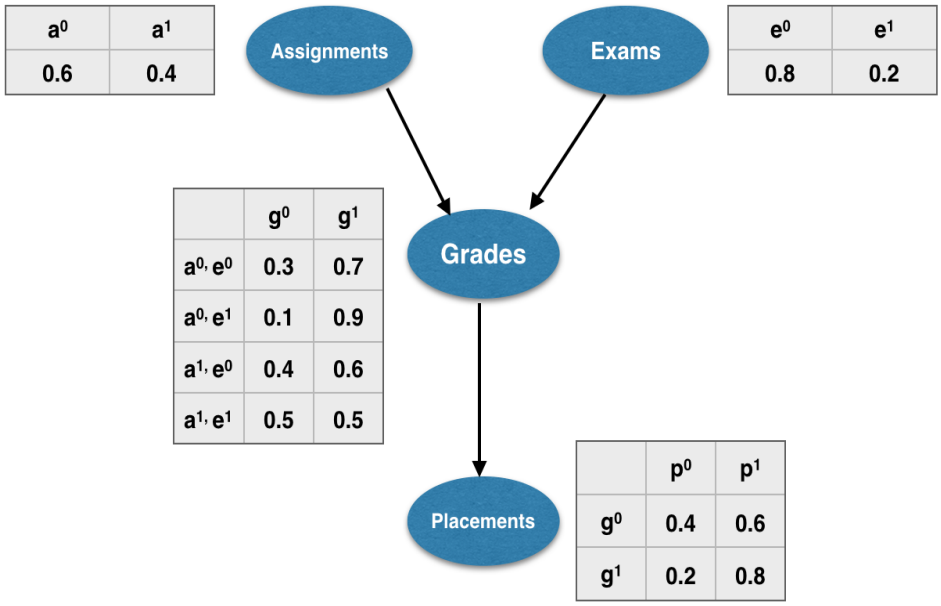
oriented career or a career in management. The expert system could also suggest the hobby clubs he/she could be part of that might increase his exposure towards his desired career path. Take into consideration various factors such as CGPA, paper publications, awards or memberships of any clubs that might influence the overall goal.

[10 Marks]

3. **Problem 3 :**

Students at the University need to do their assignments and write the exams well in order to get a good grade which will in turn get them a good placement. The probability distribution of getting a placement are as follows.

[10 Marks]



a^0	a^1
0.6	0.4

e^0	e^1
0.8	0.2

	g^0	g^1
a^0, e^0	0.3	0.7
a^0, e^1	0.1	0.9
a^1, e^0	0.4	0.6
a^1, e^1	0.5	0.5

	p^0	p^1
g^0	0.4	0.6
g^1	0.2	0.8

Calculate the probability that in spite of not writing the exams and just submitting the assignments and with a low grade the student manages to secure a placement.

Design a Bayesian network for the above problem. Model the above Bayesian network and simulate it using SamIam tool/ Genie tool.

References:-

SamIam is a software tool for the creation and consultation of Bayesian networks. The SamIam software package can be downloaded from:
http://reasoning.cs.ucla.edu/samiam/.

An alternative package is Genie, a Windows-based system, which, however, also runs on Linux using wine; it contains much more functionality than SamIam. However, as a consequence of this, Genie is less easy to use than SamIam. Genie can be downloaded from: https://www.bayesfusion.com/.

Submissions:
All your submissions need to be tarred into a file named Your_ID.rar. Include a readme.txt with group details in your tar file. Upload only one file per group in the following form.

https://docs.google.com/forms/d/e/1FAIpQLSewCFZ7ctSb9rrbEThbFijevxRUhu1IbQfOkekvhdIAYV_5RQ/viewform

Also ensure the members of the group are the same as those from the previous assignment.

For any further queries please reach out to p20170403@hyderabad.bits-pilani.ac.in