**Northeastern University**

CS 5100 Foundations of Artificial Intelligence

**Homework and PA #5** [300 points]

Please - clearly write your **full name** on the first page. Submit a single PDF file as your answer.

Please provide brief but complete explanations, using diagrams where necessary, and suitably using your own words. While presenting calculations and equations, explain the variables and answers in words.

Study Chapter 8, 9 and 10 of Russel AI textbook – selected sections only, plus propositional Logic notes provided. Answer the below questions:

1. **From textbook p. 315-320** [50 points]
2. Problem 8.1 a, b and c
3. Problem 8.3
4. Problem 8.6
5. Problem 8.9 a and b
6. Problem 8.10 a and b
7. **From textbook p. 365** [30 points]
8. 9.23 a and b only
9. 9.24 a, b, c only
10. **From textbook p. 396-398** [20 points]
11. Problem 10.2
12. Problem 10.3
13. Problem 10.4
14. Problem 10.9

PART B: Programming Assignment

1. Study this tutorial about STRIPS approach to AI planning.

<http://www.primaryobjects.com/2015/11/06/artificial-intelligence-planning-with-strips-a-gentle-introduction/>

Compile and run the code to simulate the Sneak-Past-Dragon-to-Castle Problem and explain the results. How would you use this framework and code to solve the Wumpus World problem? No need to implement this but explain in detail how this would be designed.

1. Study this tutorial about GRAPHPLAN approach to AI planning.

<https://www.annytab.com/graphplan-algorithm-in-python/>

Compile and run the code to simulate the Bucharest routing Problem they implemented and explain the results. How would you use this framework and code to solve another AI problem of your choice? No need to implement this but explain in detail how this would be designed.

**References**

<https://towardsdatascience.com/ai-planning-historical-developments-edcd9f24c991>

<https://en.wikipedia.org/wiki/Graphplan>