

CS 401 - Artificial Intelligence
Assignment # 1 (for Section A and B)

Max Marks: 60

Due Date: February 18, 2020

Q1. Differentiate between A*, RTA* and LRTA* Algorithms and Implement Dynamic Route Planner for Ambulance Management System in Lahore. You are required to design the complete system for *Dynamic route planning for ambulance optimal path (Shortest-distance finding problem)*. You can use any tool for its implementation. You can use google maps as well. You can use bit-map method for simulation by using (40 x 40) , (60 x 60) or (80 x 80) grid and use cells as 2D locations e.g., start-state (2, 3) to destination (38, 39) with obstacles and roads infra-structure as well. First, map your problem and then propose solution. You can use case study of Rescue 1122 ambulance service in Lahore and design an optimized scheduling system for ambulance planning. (20)

References:

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.137.1955&rep=rep1&type=pdf>
http://turing.cs.pub.ro/blia_2003/Real-time_search_1.htm
<https://arxiv.org/pdf/1308.3309.pdf>
<https://arxiv.org/pdf/1110.4076.pdf>
<http://www.cs.unh.edu/~ruml/papers/rtds-socs10.pdf>
<http://www.ai.soc.i.kyoto-u.ac.jp/~ishida/pdf/aamas98.pdf>
<http://www.cs.cmu.edu/~esefer/papers/realtime.pdf>

Q2. Comparative analysis of features/functions of 4-5 commercial tools/applications for route planning available in different parts of the world e.g., USA, UK, Europe, UAE, etc. For example: www.mapquest.com and WAZE <https://www.waze.com/livemap> <https://developers.google.com/waze/> , THEAA, RAC, Green Flag, etc. Propose some modifications or innovation in these route planners for Pakistani environment. Can we incorporate some extra services like blood donation, ride sharing, security, smart tourism, restaurant recommendation system within main car navigation system, etc., (20)

Q3. Design and describe “data, software and hardware requirements” for the “Smart Crop Monitoring and Management System” from AI perspective. Assume, you are required to design the complete system for an efficient monitoring and management of Crops. There must be modules for planning, healthcare, pesticides/medication, location-based services, transportation, prediction, warning, resource allocation, optimization, weather prediction, epidemics, real-time monitoring of water flow/level, flood and rain predictions, etc., Highlight the use of cloud, Internet of Things, data science, image processing, robotics, drones, prediction, classification and clustering techniques as well.

Write critical report on the advantages and disadvantages [features and limitations] of the existing system. What can be implemented in current system based on Artificial Intelligence that results in “Smart Agriculture”? (20)

Submit hardcopy in office before 4 pm - February 18, 2020.....