17th October, 2023

BRAC UNIVERSITY
Department of Computer Science and Engineering
B.Sc. in CS / CSE Program
Quiz 1, Fall 2023

Course: **CSE437 (Data Science: Working with Real World Data)**
Full Marks: **10**
Time: **60 minutes**

Note: Course Outcome (CO), Cognitive Level and Mark of each question are mentioned at the right margin.

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1. When you're looking for a community to live in, there are a lot of factors you might consider, e.g., home affordability, proximity to work, and quality of the nearby natural environment. Livability is a measurement of how attractive a neighborhood, city, and/or region is for you based on a variety of factors.
Construct a regression tree which is a non-linear machine learning model to predict the **livability score** of different cities of this world considering the *Safeness score, Environment, and Affordability* features of the following dataset. Consider the expansion threshold as 2. [CO2, C4, Marks: 10]

	City	*Safeness score*	*Environment*	*Affordability*	*Livability Score?*
	Tokyo	88	Excellent	Expensive	80
	Seoul	86	Good	Affordable	78
	Singapore	84	Good	Expensive	75
	Delhi	50	Unhealthy	Affordable	50
	New York	70	Good	Expensive	79
	Karachi	40	Unhealthy	Affordable	47
	Amsterdam	90	Excellent	Affordable	86

Afterward, **Infer** the livability score of Dhaka city from the constructed regression tree and based on the following feature values:

City	*Safeness score*	*Environment*	*Affordability*	*Livability Score?*
Dhaka	52	Unhealthy	Expensive	?