COMP 4983: Lab Exercise #7 Mark: /50

[Due: Oct 28, 2022 @2359
Assignment Submission
Folders]

Instructions:

In this lab, you will induce and use a decision tree to predict if a given day is suitable to PlayBocce based on the following features:

- **Forecast** = {Sunny, Overcast, Rain}
- **Temperature** = {Hot, Mild, Cool}
- **Humidity** = {High, Normal}
- **Wind** = {Weak, Strong}

You are provided with a training set of 14 samples shown in the table below.

Sample	Input Features				Output: PlayBocce
	Forecast	Temperature	Humidity	Wind	
1	Sunny	Hot	High	Weak	No
2	Sunny	Hot	High	Strong	No
3	Overcast	Hot	High	Weak	Yes
4	Rain	Mild	High	Weak	Yes
5	Rain	Cool	Normal	Weak	Yes
6	Rain	Cool	Normal	Strong	No
7	Overcast	Cool	Normal	Strong	Yes
8	Sunny	Mild	High	Weak	No
9	Sunny	Cool	Normal	Weak	Yes
10	Rain	Mild	Normal	Weak	Yes
11	Sunny	Mild	Normal	Strong	Yes
12	Overcast	Mild	High	Strong	Yes
13	Overcast	Hot	Normal	Weak	Yes
14	Rain	Mild	High	Strong	No

1) [45 marks] Perform decision tree induction and draw the decision tree learned from these training samples up to a maximum tree depth of five (5). For each node, clearly indicate the information gain for each considered feature. Show all steps.

2) [5 marks] Using the decision tree from Step (1), predict whether it is suitable to play bocce on a {Sunny, Cool, High, Strong} day.

Deliverable:

All work submitted is subject to the standards of conduct as specified in BCIT Policy 5104. Late submissions will not be accepted.

[Oct 28, 2022 @2359] Submit your solution to this lab exercise using the filename *lab7.pdf* to BCIT Learning Hub (Laboratory Submission | Lab 7). Your submission must include a cover page clearly specifying your name and student number.