ASSIGNMENT 1

Machine Learning

FA21-BSE-105

Question1: [CLO-1] - [Bloom Taxonomy Level: <Applying>]
Using Candidate-Elimination algorithm, find (manually) the set of all hypotheses consistent with the following training instances. Show step-by-step complete working of the algorithm. (create and upload the PDF file)

Origin	Manufacturer	Color	Decade	Type	Target
Japan	Honda	Blue	1980	Economy	+
Japan	Toyota	Green	1970	Sports	-
Japan	Toyota	Blue	1990	Economy	+
USA	Chryler	Red	1980	Economy	-
Japan	Honda	White	1980	Economy	+

S0 : < ∅ , ∅ , ∅ , ∅ , ∅ >
G0: <?,?,?,?,?>

FOR h1 : <Japan, Honda, Blue, 1980, Economy> +

S1: <Japan, Honda, Blue, 1980, Economy>
G1: <?,?,?,?,?>

FOR h2 : <Japan, Toyota, Green, 1970,Sports> -

S2: <Japan, Honda, Blue, 1980, Economy>
G2: {< ?, Honda,?,?,?>, < ?,?, Blue, ?,?>, <?,?,?,1980,?>, <?,?,?,?, Economy>}

FOR h3: <Japan, Toyota, Blue, 1990, Economy> +

S3: <Japan, ?, Blue, ?, Economy>
G3: { < ?,?, Blue, ?,?>, <?,?,?,?, Economy>}

FOR h4: <USA; Chryler, Red, 1980, Economy> -

S4: <Japan, ?, Blue, ?, Economy>
G4: { < ?,?, Blue, ?,?>, <Japan,?,?,?, Economy>}

FOR h5: <Japan, Honda, White, 1980, Economy> +

S5: <Japan, ?,?,?,Economy>
G5: <Japan, ?,?,?,Economy>

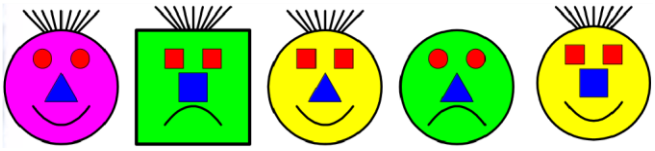
Final Specific Hypothesis

S5: <Japan, ?,?,?,Economy>

Final General Hypothesis

G5: <Japan, ?,?,?,Economy>

Question2: [CLO-1] - [Bloom Taxonomy Level: <Applying>]
Using Find-S algorithm, find (manually) a hypothesis that is consistent with the following dataset. Show step-by-step complete working of the algorithm. (create and upload the PDF file)



Train/Test Split : 60%/40%
Training set :

h1 : <circle, circle, yes, triangle, pink, up> +
h2 : <square, square, yes, square, green, down> -
h3 : <circle, triangle, yes, triangle, yellow, up> +

Testing set:

h4 : <circle, triangle, no, triangle, green, down> -
h5 : <circle, square, yes, square, yellow, up> +

Most specific hypothesis: < ∅ , ∅ , ∅ , ∅ , ∅ , ∅ >
Training:

h0: < ∅, ∅ , ∅ , ∅ , ∅ , ∅ >
h1: <circle, circle, yes, triangle, pink, up>
h3: <circle, ?, yes, triangle, ? , up>

TRAINED MODEL: h3: <circle, ?, yes, triangle, ? , up>

TESTING:

h4 : <circle, triangle, no, triangle, green, down> - **(predictive output : negative || original output : negative)**
h5 : <circle, square, yes, square, yellow, up> + **(predictive output : negative || original output : positive)**

ACCURACY = ½ = 50%