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BL2

D:{<<0,0>, 1>, <<0,1>, 0>, <<1,0>, 1>,<<1,1>, 1>}
H: Each hypothesis h ∈ H (h : X → {0, 1}) is represented by a conjunction of constraints on input

   a) h0 = <null, null>
      h1 = <0, 0>
      h2 = <0, 0>
      h3 = <?, 0>
      h4 = <?, ?>

   b) h4 is not consistent with D as <0,1> satisfies h4 (h4(<0,1>) = 1 but c(<0,1>) = 0. Hence, h(x) != c(x) for <<0,1>, 0> ∈ D.

   c) Proposition 2 states that if c ∈H, then hn is consistent with D. However, the actual target concept c ∉ H since c(<0,1>) = 0 and c(x) = 1 for all other x cannot be represented as a conjunction of constraints on the input attributes. Hence, the implication stated by the proposition is vacuously true and not a contradiction.

BL3

   a) Prove that h is consistent with all positive training examples observed so far, not including d.

      1. For all s ∈ S, s is consistent with all training examples observed so far. (def of S)
      2. Every positive training instance so far, not including d, satisfies s (by Proposition 1)
      3. Since h is a minimal generalization of s, h is more general than s.
      4. For all x ∈ X, s(x) = 1 -> h(x) = 1. (def of more general)
      5. Every positive training instance observed so far, not including d, satisfies h.
      6. Thus, h is consistent with all positive training examples observed thus far, not including d (Proposition 1)

   b) Prove that h is consistent with all negative training examples observed so far.

      1. For all g ∈ G, g is consistent with all training examples observed so far. (def ofG)
      2. Every negative training instance so far does not satisfies g (by Proposition 1)
      3. Since some member of G is more general than h,for all x ∈ X, h(x) = 1 -> g(x) = 1. (def of more general)
      4. for all x ∈ X, g(x) = 0 -> h(x) = 0. (contrapositive of 3.)
      5. Every negative training instance observed so far does not satisfy h.

6. Thus, h is consistent with all negative training examples observed thus far (Prop 1)

TM2.3

X1 = <Sunny, Warm, Normal, Strong, Warm, Same> +ve
X2 = <Sunny, Warm, High, Strong, Warm, Same> +ve
X3 = <Rainy, Cold, High, Strong, Warm, Change> -ve
X4 = <Sunny, Warm, High, Strong, Cool, Change> +ve

S0 = {<null, null, null, null, null, null> V <null, null, null, null, null, null>}
S1 = {<Sunny, Warm, Normal, Strong, Warm, Same> V <null, null, null, null, null, null>}
S2 = {<Sunny, Warm, Normal, Strong, Warm, Same> V <Sunny, Warm,High, Strong, Warm, Same>,
<Sunny, Warm, ?, Strong, Warm, Same> V <null, null, null, null, null, null>}
S3 = {<Sunny, Warm, Normal, Strong, Warm, Same> V <Sunny, Warm,High, Strong, Warm, Same>,
<Sunny, Warm, ?, Strong, Warm, Same> V <null, null, null, null, null, null>}
S4 = {<Sunny, Warm, ?l, Strong, ?, ?> V <Sunny, Warm,High, Strong, Warm, Same>, <Sunny, Warm,
Normal, Strong, Warm, Same> V <Sunny, Warm,High, Strong, ?, ?>, <Sunny, Warm, ?, Strong,
Warm, Same> V <Sunny, Warm, High, Strong, Cool, Change>}

G4 ={<Sunny, ?, ?, ?, ?, ?> V <Cloudy, ?, ?, ?, ?, ?>, <Sunny, ?, ?, ?, ?, ?> V <?,Warm, ?, ?, ?, ?>,
<Sunny, ?, ?, ?, ?, ?> V <?, ?, Normal, ?, ?, ?>, <Sunny, ?, ?, ?, ?, ?> V <?, ?, ?, Weak, ?, ?>,
<Sunny, ?, ?, ?, ?, ?> V <?, ?, ?, ?,Cool, ?>, <Sunny, ?, ?, ?, ?, ?> V <?, ?, ?, ?, ?, Same>,
<Cloudy,?, ?, ?, ?, ?> V <?,Warm, ?, ?, ?, ?>, <?, Warm, ?, ?, ?, ?> V <?,?, Normal, ?, ?, ?>,
<?, Warm, ?, ?, ?, ?> V <?,?, ?, Weak, ?, ?>, <?, Warm, ?, ?, ?, ?> V <?,?, ?, ?, Cool, ?>,
<?, Warm, ?, ?, ?, ?> V <?,?, ?, ?, ?, Same>, <?, ?, ?, ?, Cool, ?> V <?,?, ?, ?, ?, Same>}

G3 = {<Sunny, ?, ?, ?, ?, ?> V <Cloudy, ?, ?, ?, ?, ?>, <Sunny, ?, ?, ?, ?, ?> V <?,Warm, ?, ?, ?, ?>,
<Sunny, ?, ?, ?, ?, ?> V <?, ?, Normal, ?, ?, ?>, <Sunny, ?, ?, ?, ?, ?> V <?, ?, ?, Weak, ?, ?>,
<Sunny, ?, ?, ?, ?, ?> V <?, ?, ?, ?,Cool, ?>, <Sunny, ?, ?, ?, ?, ?> V <?, ?, ?, ?, ?, Same>,
<Cloudy,?, ?, ?, ?, ?> V <?,Warm, ?, ?, ?, ?>, <Cloudy,? , ?, ?, ?, ?> V <?,?, ?, ?, ?, Same>,
<?, Warm, ?, ?, ?, ?> V <?,?, Normal, ?, ?, ?>, <?, Warm, ?, ?, ?, ?> V <?,?, ?, Weak, ?, ?>,
<?, Warm, ?, ?, ?, ?> V <?,?, ?, ?, Cool, ?>, <?, Warm, ?, ?, ?, ?> V <?,?, ?, ?, ?, Same>,
<?, ?, Normal, ?, ?, ?> V <?,?, ?, ?, ?, Same>, <?, ?, ?, Weak, ?, ?> V <?,?, ?, ?, ?, Same>,
<?, ?, ?, ?, Cool, ?> V <?,?, ?, ?, ?, Same>}

G2 = { <?, ?, ?, ?, ?, ?> V <?, ?, ?, ?, ?, ?>}
G1 = {<?, ?, ?, ?, ?, ?> V <?, ?, ?, ?, ?, ?>}
G0 = {<?, ?, ?, ?, ?, ?> V <?, ?, ?, ?, ?, ?>}