Assignment 2, Question 1

NAME: Mishelle Bitman, mishelle.bitman@torontomu.ca, 501091629
NAME: Ivana Miovcic, ivana.miovcic@torontomu.ca, 501012152
NAME: Daniel Persaud, d2persaud@torontomu.ca, 501083191

1a) [X, Y | Z] and [a, b, c | [d, e, Y]]

Left side can be written as: [X, Y | Z] = [X, Y, Z]
Right side can be written as: [a, b, c | [d, e, Y]] = [a,b,c,d,e,Y]
Take X = a, Y = b, Z = [c,d,e,b]
Yes, given the variables above, the first list becomes [a, b, c, d, e, b] and the second list becomes [a, b, c, d, e, b] and the two lists match.

1b) [q, [A | [r, s]], t] and [q, [r, [r, s]] | B]

Left side can be written as: [q, [A, r, s], t]
Right side can be written as: [q, [r, [r,s]], B]
Take A = r, B = t
Then the first list becomes [q, [r, r, s], t] and the second list becomes [q, [r, [r,s]], t] and the two lists do not match as [r, r, s] does not equal [r, [r,s]].

1c) [[Cow | [cat, dog]], bird, bug, chicken] and [[ant, [cat, dog]] | Horse]

Left side: [[Cow | [cat, dog]], bird, bug, chicken] = [[Cow, cat, dog], bird, bug, chicken]
Right side: [[ant, [cat, dog]] | Horse] = [[ant, [cat, dog]], Horse]
Cow = ant
Horse = [bird, bug, chicken]
The two lists do not match. Even if Cow was assigned the value ant, then the expression on the left would be [[ant, cat, dog], bird, bug, chicken], and the [[ant, [cat, dog]], bird, bug, chicken] and the lists would not be the same.

1d) [1, A, 2 | [A, 3, 4]] and [B | [2, C | [D | E]]]

Left side can be written as: [1, A, 2, A, 3, 4]
Right side can be written as: [B, 2, C, D | E]
Take B = 1 A = 2 C = 2 D = 2 E = 3,4
Then the first list becomes [1, 2, 2, 2, 3, 4] and the second list becomes [1, 2, 2, 2, 3, 4] and the two lists match.

1e) [A|[A|[[A|[[A]]]]]] and [b|C]

Left side: [A|[A|[[A|[[A]]]]]] = [A, A|[[A|[[A]]]]] = [A, A, [A|[[A]]]] = [A, A, [A, [A]]]
Right side: [b|C]

Take A = b and C = [b, [b, [b]]].
The left side becomes [b, b, [b, [b]]] and the right side becomes [b, b, [b, [b]]]. The two sides match and the lists are equal with the given variables above.

1f) [X | [Y | [Z | [X]]]] and [all, around, the, world, Y]
Left side: [X | [Y | [Z | [X]]]] = [X | [Y | [Z, X]]] = [X | [Y, Z, X]] = [X, Y, Z, X]
Take X = all , Y = around, Z = the, X = World
No, the lists are not equal because X is a single variable and can not represent two different values. The variable Y in the right list also does not map to any elements in the left list.

1g) [1, 2 | [X | [Y, Z | X]]] and [Q | [R, S, [], [[Y]]]]

Left side: [1, 2 | [X | [Y, Z | X]]] = [1, 2, X | [Y, Z | X]] = [1, 2, X, Y, Z | X]
Right side: [Q | [R, S, [], [[Y]]]] = [Q, R, S, [], [[Y]]]
Take Q = 1,
R = 2,
S = [ ],
Y = [ ],
Z = [[Y]] = [[[ ]]],
X = [ ]
Then [Q, R, S, [], [[Y]]] = [1, 2, [ ], [ ], [[[ ]]] and [1, 2, X, Y, Z | X] = [1, 2, [ ], [ ], [[[ ]]]]
Yes, the two lists are equal using the variables above.

1h) [Lions, [[and], tigers], [and], bears, oh | [[my]]] and [[I, have], [[A], Bad], Feeling | [About | This]]

Left side: [Lions, [[and], tigers], [and], bears, oh, [my]]
Right side = [[I, have], [[A], Bad], Feeling, About | This] = [[I, have], [[A], Bad], Feeling, About, This]
Take Lions = [I, have], A = and, Bad = tigers, Feeling = [and], About = bears, This = [oh, [my]]
Then [[I, have], [[A], Bad], Feeling, About, This] = [[I, have], [[A], Bad], Feeling, About, This]
Yes, the left side is equal to the right side given the variables above.