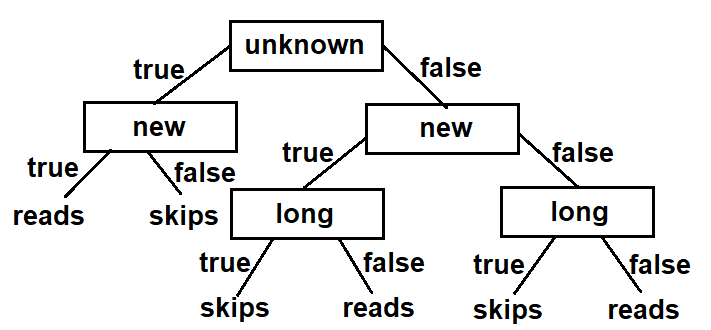
**Assignment 2**

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Question 1:



They are different. The function with the maximum information gain split looks like this.

if long(e): return skips

else if new(e): return reads

else if unknown(e): return skips

else: return reads **(function 1)**

The function from the new decision tree is like

if unknown(e): if new(e): return reads

else: return skips

else: if new(e): if long(e): return skips

else: return reads

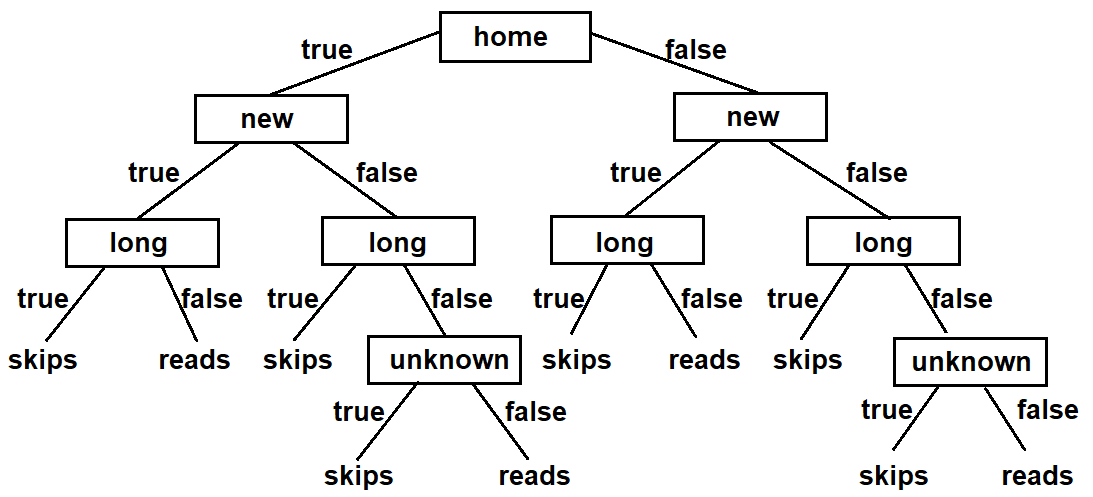
else: if long(e): return skips

else: return reads **(function 2)**

Structurally, they are different functions. And one function cannot be transformed to the other. Additionally, there’s a counter example e19 from Figure 7.1 which is *<unknown, new, long, work, User\_action>*

If we use this to test both functions, the function 1 gives the output User\_action = **skips** while function 2 gives **reads**. Thus, they are completely different.

b)



This tree represents the following function 3 which is substantially the same as function 1.

if home(e): if new(e): if long(e): return skips

else: return reads

else: if long(e): return skips

else: if unknown(e): return skips

else: return reads

else: if new(e): if long(e): return skips

else: return reads

else: if long(e): return skips

else: if unknown(e): return skips

else: return false **(function 3)**

Though the structure of the 2 functions look different, they are identical substantially. As we can transform one function to the other. In the new decision tree, we can see that whatever values and are, if is true, the result is **skips**. This corresponds to 1st line of function 1. Similarly, whatever value is, if is false and is true, the result is **reads.** Corresponding to 2nd line of function 1. Whatever value is, if is false and is false and is true, the result is **skips**. Corresponding to 3rd line of function 1. Finally, whatever value is, if , and are all false, the result is **reads**. Corresponding to 4th line of function 1. Thus, they are the same function.

1. A

Question 2: