Assignment #7

머신러닝 이론과 실전 Due: November 1, 2021

1. Write your own code for 1-level decision tree. '1-level decision tree' means a tree that splits only the root node.
    a. Use a file named "titanic.csv" for the training. The "titanic.csv" dataset has three categorical X variables and one categorical Y variable (named 'Survived').
    b. Make your program to implement 1-level decision tree only for two classes.
    c. Prompt the user whether to run CART tree or C4.5 tree.
    d. Find a splitting rule, then split the current node into two subnodes. (Categorical variables should be considered in this assignment)
    e. Print out the 1-level tree information and number of observations from each class (see below).

The output file for classification generated by the program must look like

```
Tree Structure (CART)
      Node 1: No (711, 1490)
        Node 2: Class = {First, Second}, Yes (510, 467)
        Node 3: Class = {Third, Crew}, No (201, 1023)

Tree Structure (C4.5)
      Node 1: No (711, 1490)
            Node 2: Class = {First}, Yes (310, 167)
            Node 3: Class = {Second}, No (200, 300)
            Node 4: Class = {Third}, No (100, 923)
            Node 5: Class = {Crew}, Yes (101, 100)

Confusion Matrix (Training)
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                   Predicted Class
                      Yes      No
Actual      Yes       239      14
Class       No         12     153

Model Summary (Training)
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Overall accuracy = .793
```