Assignment Report

Implementation of algortihm 4.1 and 4.2

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I. Introduction

In this report, we try to implement two algorithms and accordingly depict the results that we have obtained. In first algorithm, we try to find least general generalization for a set of instances. In second algorithm, we try to find least general conjunctive generalization of two conjunctions. The hypothesis space for the given data is 108 as we have 5 features and out of which for 3 of them there are 3 possibilities and for 2 of them there are 2 possibilities. So, the possible instances can be calculated as 3x3x3x2x2=108.

II. Implementation

Initially we pass the given data as input. We know the features and instances. The features given are Ambition, Programming experience, English language skills, Creative and Meticulous. The three instances which have been given for the features which are favorable and belong to our concept are:

1. High, medium, medium, yes, yes.
2. Medium, high, medium, yes, yes.
3. Medium, medium, high, yes, yes.

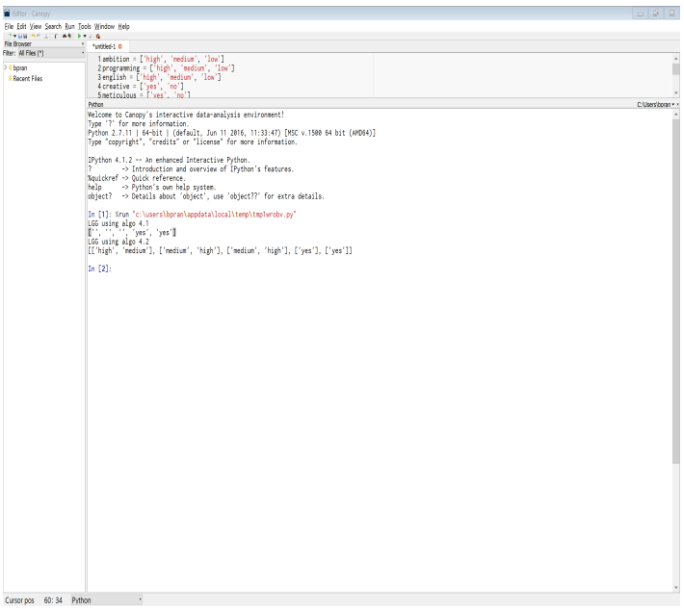
Now as per the given instances, I write the code for the first and the second algorithm in python. Initially I declare all the required things like features, instances. Then I write the code for the first algorithm and then after it for the second algorithm. Finally, I ensure that the code I implemented is satisfying the conjunctive rule. The conjunctive rules that needs to be satisfied for the given data as per the algorithm 4.1 and 4.2 are:
Algorithm 4.1:
Creative = yes ^ Meticulous = yes
Algorithm 4.2:
Ambition = [high, medium] ^ Programming experience = [medium, high] ^ English language skills = [medium, high] ^ [Creative = yes] ^ [Meticulous = yes]

III. Results

The output we got using algorithm 4.1 and 4.2 respectively using the given data are:

Algorithm 4.1:
LGG using algo 4.1
['', '', '', 'yes', 'yes'].
It means the conjunctive rule for the least general generalization of the given data using algorithm 4.1 as per the output we obtained is: Creative = yes ^ Meticulous = yes. Hence the output I obtained satisfies the conjunctive rule of algorithm 4.1.

Algorithm 4.2:
LGG using algo 4.2
[['high', 'medium'], ['medium', 'high'], ['medium', 'high'], ['yes'], ['yes']]
It means the conjunctive rule for the least general generalization of the given data using algorithm 4.2 as per the output we obtained is: Ambition = [high, medium] ^ Programming experience = [Medium, high] ^ English language skills = [medium, high] ^ [Creative = yes] ^ [Meticulous = yes]. Hence the output I obtained satisfies the conjunctive rule algorithm. The output of the implemented code is shown in the screen shot below.



References:

[1] P. Flach, *Machine learning: The art and science of algorithms that make sense of data*. Cambridge: Cambridge university press, 2012.