

國立交通大學試題紙

科目：人工智慧 (A)

日期：96 年 7 月 26 日 第 1 頁 共 1 頁

請 “✓” 明 ✓不可看書 可看書

* 請將答案依題號順序寫入答冊

1. You are a witness of a night-time hit-and-run accident involving a taxi in Athens. All taxis in Athena are blue or green. You swear, under oath, that the taxi looked blue. Extensive testing shows that under the dim light conditions, the probability that a taxi looks blue, given the taxi is actually blue, is 75%. Likewise, the probability that a taxi looks green, given the taxi is actually green, is also 75%. Based on maximum likelihood, what is the most likely color for that hit-and-run taxi (5pts)? What now based on MAP (maximum a posteriori), given that 9 out of 10 Athenian taxis are green(5pts)?
2. In learning, attributes can be roughly categorized as discrete-valued or continuous-valued. For which type of attributes, we never use the same attribute twice along one path in a decision tree and why not (5pts)? Then how do we reuse the same attribute in the other category along one path (5pts)?
3. (10pts) Let's define "Boolean True" as 1, and "Boolean False" as 0. Given two Boolean inputs, implement a neural network with only two input units, one hidden unit and one output unit to learn an XOR function. Draw your neural network clearly, and specify all the weights and thresholds. Note that you can have whatever connections you like.
4. (10pts) Describe two widely-used pruning strategies for decision tree learners, and briefly explain why pruning is useful.
5. (10pts) By comparing rote learners (learning by simply remember each observed training example) with decision tree learners, briefly describe the need for inductive bias.