

國立交通大學試題紙

九十八學年度第一次
博士班資格考

科目：人工智慧 (A)

日期：99 年 1 月 27 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案卷

答題時字跡需工整，否則不予計分。Write your answers legibly; otherwise you will get zero score.

1. (10 pts) From Bayesian point of view, discuss the difference between the Maximum Likelihood model(ML) and the Maximum A Posteriori model(MAP). (Try to be precise and concise.)
2. (16 pts) An exactly m-of-n Boolean function is one whose value is “True” if exactly m attributes out of n Boolean attributes are “True.” Draw an ANN and a decision tree for an exactly 2-of-3 Boolean function (assuming True= 1; False= 0). Specify all the necessary weights. (Note there could be more than one answer. Just put down one. Also you can have only ONE layer of hidden units.)
3. (10 pts) Briefly describe “repeated random sampling” and “k-fold cross validation” in accuracy estimation, and briefly explain which is better in general.
4. (14 pts) As a data mining system designer, you are asked to develop a mining system. You are informed that your client is a Wall st. stock market investor who is serious about long-term investment, and interested in high-quality market prediction. What are the concerns of your mining system? (Try to be precise and concise.)

科目：人工智慧(B)

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1. (10 points) Define the following terms and give an example in terms of AI design for each one.
 - A. Reflex agent
 - B. Model-based agent
 - C. Goal-based agent
 - D. Utility-based agent
2. (10 points) For each of the following tasks, select an agent model from Problem 1 for its implementation, and explain the reason why you think the model is a proper choice, i.e., neither too simple nor too complicated for the given task.
 - A. Search on the Internet for a good restaurant.
 - B. Solve a Sudoku (數獨) puzzle.
 - C. Plan a 7-day honeymoon trip in Hawaii.
 - D. Design an expert system for fast H1N1 diagnosis.
3. (10 points) Prove the following statements:
 - A. Breadth-first search is a special case of uniform-cost search.
 - B. Uniform-cost search is a special case of A* search.
4. (20 points) Consider the following facts:
 - The members of the *Bridge Club* are Joe, Sally, Bill, and Ellen.
 - Joe is married to Sally.
 - Bill is Ellen's brother.
 - The spouse of every married person in the club is also in the club.
 - The last meeting of the club was at Joe's house.
 - A. Represent these facts in predicate logic.
 - B. Given the five facts listed above, construct resolution proofs to demonstrate the truth of the following two statements. If you need other facts to construct the proofs, add them and explain why.
 - The last meeting of the club was at Sally's house.
 - Ellen is not married.