



12 Pages

1. Please give the information requested in the boxes below
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1	Student Number	2304827
2	Title of Examination Paper	Artificial intelligence
3	Module Code	ACCA7026
4	Date and Time of Examination	08.05.2024 9:00 - 11:00
5	Examination Venue	20 310
6	Seat Number	34
7	Number of Answer Books handed in	

List the numbers of the questions you have attempted	Office Use
2.	04.5
3	09
4	16.5
Total	30

(Gweler yr ochr arall am y fersiwn Cymraeg)

FOREIGN

Examiner Only

note.

1. cause

used (2)

tasks.

37.5%

$$\begin{array}{r} 30 \\ \hline 80 \end{array}$$

2.1 A* ~~need~~ need know the start node and final node.

It's ~~need~~ need know the ~~known~~ total environment because these information will ~~used to related to~~ will used to calculate the costs. Thus it's also not fit for dynamic tasks. A* is not fit for finding a good strategy. We usually use it to find the shortest path between two points in known world.

2.2 MCTS is suitable for create strategy and it can used in dynamic nature of game such as Go and Chess. It can consider diverse case and give the ~~most~~ best choice which is most probably to win.

more detailed explanation required.

[09]

$$UCB = \bar{X} + C \sqrt{\frac{\log N}{n_i}}$$

$$\bar{X} = v_i = 0.8$$

$$C = 1.5$$

$$N = 80$$

$$n_i = 15$$

$$UCB = v_i + C \sqrt{\frac{\ln N}{n_i}} = 0.8 + 1.5 \sqrt{\frac{\ln 80}{15}} = 1.24$$

3.2

3.2.1 unsupervised. It's aim to find structure.

3.2.2 supervised. It's a classification problem.

3.2.3 supervised.

3.2.4 Reinforcement learning. It's aim to optimize the sequence of action to get great rewards.

dynamic environment exploration & exploitation

Question No.

[164]

0/10

4.2.1

0/1

4.2.2

0/1

4.2.3 Missing values is a very small part of the dataset.

2/2

All in all, only the missing values has very little influence to the result we can do it.

4.3 We need to classify the result to "accepted" or "rejected". So it is a binary classification task.

4/4

GRE, TOEFL, University Rating, SOP, LOR, GPA, Research, Admit

4.4

In this question, we need to predict whether the applicant was accepted or rejected. Thus ~~the~~ ^{the} S activation function which is a binary classification is suitable. It can give us a probability.

We

When we The selection of activation function is depend on task. We need ~~consider~~ think about the kinds of tasks (eg: classification or regression) and the result we need (eg: x% or (x_1, x_2))

4.5 Overfitting means the model perform well in ~~the~~ training data and poorly perform on unseen data.

To solve the problem

1. We can reduce the number of layers.
2. ~~Early~~ Early stopping.
3. Using Bagging. Boosting. Stracking.

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4.6

4.6.1

$$TP = 150$$

$$FP = 30$$

$$TN = 5$$

$$FN = 15$$

Table completed

4/4

4.6.2

$$\text{precision} = TP / (TP + FP) = 150 / (150 + 30) = 0.83$$

$$\text{recall} = TP / (TP + FN) = 150 / (150 + 15) = 0.91$$

$$F_1 = 2(\text{precision} \times \text{recall}) / (\text{precision} + \text{recall})$$

$$= 2(0.83 \times 0.91) / (0.83 + 0.91)$$

$$= 0.87$$

$$\text{accuracy} = (TP + TN) / (TP + TN + FP + FN)$$

$$= (150 + 5) / (150 + 5 + 30 + 15)$$

4/8

45 165
70