CA1

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1 Definitions

AI
When humans consider the operation of a computer program as exhibiting intelligence, then that program has *Artificial Intelligence*.

Machine Learning
This is a type of *Inductive Learning* which takes a set of observations and can make generalisations by learning what the desired output is.

Deep Learning
In deep learning, the computer program is structured so as to mimic the human brain. This neural network is a replication of the interconnection between neurons via dendrites. The term 'deep' refers from the transformation from initial 'raw' representations to increasingly more abstract forms.

Parametric and Nonparametric models

Supervised Learning and its components
In supervised learning, each observation is type-coded with a 'label'. For instance, 'Spam', 'Not Spam' for email data. Each observation has the same set of characteristic 'features'. The algorithm learns the mapping from features

to labels and so can make predictions about new observations. The predicted output is a probability estimation. Representations include decision trees, rules and instances. The confusion matrix or ROC curve are evaluation measures.

Define AI, Machine learning and Deep learning. (50-70 words)
Define Parametric and Nonparametric models. (50-70 words)
Define Supervised learning and its components with examples. (50-70 Words)
Define Unsupervised learning and its components with examples. (50-70 Words)
What are the common types of error in Machine learning? (50 -70 Words)

Q2 Please solve the case study (2.5*4=10 marks) (800 words)
The purpose of this assignment is to build your machine learning project plan. For this exercise, you can use any one of the example scenarios provided with a completely fictitious example of the problem. You will be developing a strategic plan for machine learning adoption within this company, and eventually proposing a structure for a successful machine learning project. You will start by describing your current overall state of machine learning readiness. You will then explain the business outcome your project is driving towards, and how business success will be evaluated. You will describe, at a high-level, what machine learning project you wish to undertake. Finally you will outline the risks of this approach, in relation to your stage of readiness and the scope of the project.

Select any-one of them
You are in the social media division of a political party, and you want to keep better track of the party's profile and reputation online.
You are the head of the Corporate clients division of a major health service provider chain, and you want corporate health applications decided faster and better.
You are a software designer and you want to use ML to improve the user experience.

Answer the following questions 1) Provide a brief description of your company, industry, or business.
2) What business outcome are you supporting with your machine learning project? How is this outcome relevant and important for the company? How will you evaluate whether the desired outcome is being achieved?
3) What machine learning project will you propose to support this business

outcome? At a high level, what will your machine learning model be doing? Make the case that this is a viable project (at least in theory) and relates to your overall business goals.
4) Given the state of readiness you have described and the scope of the project you're proposing, is this a risky project, broadly speaking? That is, is it appropriate to the stage your company is at or will it provide particular challenges?

Q3 Please write the summary of the journal paper you read and explain about the machine learning techniques you learn from the journal and what are the advantage and disadvantage of the application discussed in the research project. (800 words) (5 Marks)

Q4 Please also prepare presentation (10- 15 minutes) explaining Answer 2 and Answer 3 in detail. Presentation will be hold on 27-11-2020 on zoom during class. (20 marks)