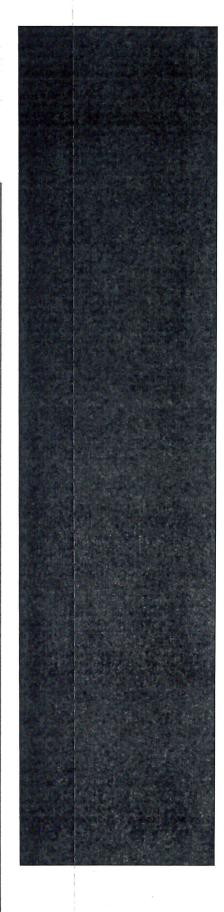
CHALMERS EXAMINATION/TENTAMEN

Course code/kurskod	Course name/kursnamn				
DIT 821	S.E. Ai System				
Anonymous code Anonym kod 0007 - KDE		Examination date Tentamensdatum	Number of pages Antal blad	Grade Betyg	
1 Dit 871 - 0007-kD		15.08.2023	8	VG	

^{*} I confirm that I've no mobile or other similar electronic equipment available during the examination. Jag intygar att jag inte har mobiltelefon eller annan liknande elektronisk utrustning tillgänglig under eximinationen.

eximination	onen.		
Solved task Behandlade uppgifter No/nr		Points per task Poäng på uppgiften	Observe: Areas with bold contour are to completed by the teacher. Anmärkning: Rutor inom bred kontur ifylles av lärare.
1	X	3	
2	X	5	
3	X	4,5	
4	X	4,5	
5			
6			
7		,	
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
Bonus poäng	1	17	
Total exami points Summa poä på tentame	ing	18	



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1- @ under fitting: the probem is when the model is Simple and basic so the soulition doesn't fit

the data

6) over fitting: the probem is when the model is complex so it sensitive for any small Changes.

6) Regularization help to address the overfitting Problem by adding penalty to the complex model durying data training and make

it balance. For example LZ Regularization.

gradient descent works with complex model and alot of data.

Normal equation: works with simple model and less data.

gradient descent. Salve Complex prolem normat eauation: complex problem

b) in true, because we have 00=01

So, they will stay equal.

Of value.

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wo = 6, w1 = -5, w2= 1 (a)

Y= 9(W0 + W1X + W2 X2)

9 (h(x)) 70,5

h(x) 70

6-5X+X2=0

5 X - X2 = 6

1 = 0 Y2 = 2

the k- mean parameter is the number and this parameter determin of clusters how many clusters centroids will Created

by K-mean algorithm when Stort. (1)

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d) the second Step is to assign each data points to closer clusters centroids the third Step is to update cluster Centroids by mean of distance between each data point position and dusters centroid belong to. and go throw each cluster and calculate the means and updat central e) cost function is the sum of set square distance between all data point position and clusters centroids? The k mean make it well formed cost function.

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Q - Feature handling:

traditional Ml. It's need manual feature engineer to handel features manual. - beep Ml. doesn't required manual because everythings automatic handel.

- Data Scaly.

traditional M. work well with Smaller dataset.

Deep M! work well with big data set. V

- performance - Galnity and performance traditional Ml: works better with simple task needs less data aluning traing data.

Deep Ml: work better with Complex neels more dated during training

data.

impresse, also can work well on simple tasks (with many dah)

Still (1)

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b) non-linearity: is serves to capture complex pattents which linear court capture it.

F(X) = X2

c) Kernel Size is observe decide the quality of maps functions produce functions Less Kennel Size Less comptex maps function

d) the functionality of the pooling layer is to reduce the Size of maps function and keep other maps function.

e) vanishing gradient prolem is happen when the network struggle of Learning because es abt es Lagout Loyer (deep). Recurrent neural networks help to some this isuee because it has memory to remober each Step So it Solve this Learning issue. Too brist (0,5)

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(a) probem happen during data collection is Everr data Entering: this can happen when entering invailed data value.

Probem happen After data collection Is: Overtime data (Pecay):

this proben happen when data became. old and not vailed Like phone number emails ... ctc.

6) yes, because ML Algorathm deal with mathmatic numbers.

one-hot fix the probelm by convert Categorical data into binary numbers (0,1) wich can be reads by ML Algorithm.

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c) the formula used to evaluate the accurate of task Like object detection the box to refers to annotated data the Score is bettweenin (0,1) when it is closer toll) is the best result. D) yes its always applicable because Amy model requirements atmos med need Something to evaluate the result. which evaluation metrics do. but they re not the only mag

Example: we create model requiremnets to catch at all ema spam emails and after we add metrics to evaluate if the result is egy equal to the spam mails estated catched.