COM6509 Machine Learning and Adaptive Intelligence (AUTUMN 2019~20)
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Review Test Submission: Formal Quiz 1

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Course	COM4509 Machine Learning and Adaptive Intelligence (AUTUMN 2019~20)
Test	Formal Quiz 1
Started	18/10/19 17:00
Submitted	18/10/19 17:47
Due Date	18/10/19 18:10
Status	Completed
Attempt Score	7 out of 10 points
Time Elapsed	47 minutes out of 50 minutes
Instructions	

Question 1

2 out of 2 points

We have two random variables X and Y. Each of the random variables can take only two values, 0 or 1. The joint distribution of X and Y is given as

$P(X=0, Y=0) = 0.2$
$P(X=0, Y=1) = 0.6$
$P(X=1, Y=0) = 0.1$
$P(X=1, Y=1) = 0.1$

What is the probability of $P(X=1)$? Use two decimals for the answer (no rounding).

Question 2

0 out of 3 points

With reference to the dataset of Movie Body Count used in Lab 1, what is the probability that a movie with more than 40 dead bodies and duration greater than 120 mins has an IMDB_rating greater than 7? Use only three decimals for your answer (no rounding).

Question 3

2 out of 2 points

We have a perceptron algorithm running. At a particular iteration through the dataset, the values of the parameters are $\boldsymbol{w} = [0.5 \ -1]^T$ (this is $w_1 = 0.5$ and $w_2 = -1$) and $b = 0.5$. We randomly pick a point with coordinates $\boldsymbol{x} = [1 \ 3]^T$ (this is $x_1 = 1$ and $x_2 = 3$). The label for this data point is +1. If the learning rate is 2, what is the updated value for b? Use two decimal points for the answer (no rounding).

Question 4

1 out of 1 points

We train two machine learning models for regression over a dataset. Let us call the two models Model A and Model B. After training both models using the same dataset, we compute the mean squared error (MSE) for each model over the same training data. Model A gives a MSE=0 and Model B gives a MSE=10. We now use both models to make predictions on a new dataset. Model A gives a MSE=100 and Model B gives a MSE=30. Which of the two models provides a better generalisation?

Question 5

2 out of 2 points

For Lab 2, you designed a movie recommendation system. The system used a matrix of ratings to build a model that expresses the matrix of ratings as the product of the matrix of users times a matrix of movies. Let us assume we have a dataset that has the movie ratings of 100 movies provided by 500 users. After training the movie recommendation system, we want to predict the rating that user 401, let's call him Joe, would give to movie 30, let's assume it is "Joker". Assume the user can be represented by the

vector $\boldsymbol{u}_{\mathbf{Joe}} = [2.3 \ -1.2]^T$ and the movie by the vector $\boldsymbol{v}_{\mathbf{Joker}} = [5.1 \ 3.1]^T$. Joe decides to watch the movie and after watching the movie, Joe gives a rating of 6.5 to the movie. Compute the squared error between the actual rating that Joe gave to the movie and the rating predicted by your system. Use two decimal points for your answer (no rounding).

Friday, 18 October 2019 17:48:06 o'clock BST

← OK