Evaluation

1. Consider the data given in the table below. The table shows the predictions made for a continuous target feature by two different prediction models for a test dataset.

ID	Target	Model 1 Prediction	Model 2 Prediction	ID	Target	Model 1 Prediction	Model 2 Prediction
1	2,623	2,664	2,691	16	2,570	2,577	2,612
2	2,423	2,436	2,367	17	2,528	2,510	2,557
3	2,423	2,399	2,412	18	2,342	2,381	2,421
4	2,448	2,447	2,440	19	2,456	2,452	2,393
5	2,762	2,847	2,693	20	2,451	2,437	2,479
6	2,435	2,411	2,493	21	2,296	2,307	2,290
7	2,519	2,516	2,598	22	2,405	2,355	2,490
8	2,772	2,870	2,814	23	2,389	2,418	2,346
9	2,601	2,586	2,583	24	2,629	2,582	2,647
10	2,422	2,414	2,485	25	2,584	2,564	2,546
11	2,349	2,407	2,472	26	2,658	2,662	2,759
12	2,515	2,505	2,584	27	2,482	2,492	2,463
13	2,548	2,581	2,604	28	2,471	2,478	2,403
14	2,281	2,277	2,309	29	2,605	2,620	2,645
15	2,295	2,280	2,296	30	2,442	2,445	2,478

Based on the data, calculate the evaluation measures listed below, for each model:
   a. The sum of squared errors
   b. The R^2 measure

Based on the measures, which model is performing better for the dataset?

2. The contingency table below shows the evaluation results for a binary classifier applied to a set of 768 test examples, which are annotated with the class labels (A, B).

From this table calculate:

   a) The precision score for both of the classes.

   b) The recall score for both of the classes.

   c) The F1-measure score for both of the classes.

d) The overall classification accuracy for all the data.

Predicted Class

A	B	
407	93	A
108	160	B

Real Class

3. The table below shows the true classes for 12 example emails, which are labelled as "spam" or "non-spam". The table also reports the labels predicted by three different binary classifiers for those emails.

a) Calculate the *overall accuracy* for each of the classifiers on this data. Based on your calculations, which classifier is the most accurate?

b) Calculate the *precision* of each classifier relative to the "spam" class. Based on your calculations, which classifier achieves the highest precision for this class?

Example	True Class Label	KNN	DecisionTree	Logistic Regression
1	spam	spam	spam	spam
2	non-spam	non-spam	spam	non-spam
3	spam	non-spam	non-spam	spam
4	non-spam	non-spam	non-spam	non-spam
5	spam	spam	spam	spam
6	non-spam	non-spam	non-spam	non-spam
7	non-spam	spam	spam	non-spam
8	non-spam	non-spam	spam	spam
9	spam	spam	non-spam	spam
10	spam	spam	non-spam	non-spam
11	spam	non-spam	non-spam	spam
12	spam	spam	spam	spam