Evidence of Learning- SIT720

1. What is the mechanism used by the Voting Classifier to aggregate predictions from multiple base models and their differences? Explain with suitable example. If predictions conflict among the base models, what strategies can be employed to resolve the conflicts and make more reliable final predictions in the Voting Classifier?

2. Can Support Vector Machine (SVM) effectively perform multiclass classification? If so, explain the approach and techniques for successful implementation. If not, clarify the limitations or challenges that restrict SVM's suitability for multiclass classification tasks.

3. Analyse the importance of the features for predicting "target''" using two different approaches. Explain the similarity/difference between outcomes.

4. Create three supervised machine learning (ML) models except any ensemble approach for predicting "target''.
    a. Report performance score using a suitable metric. Is it possible that the presented result is an overfitted one? Justify.
    b. Justify different design decisions for each ML model used to answer this question.
    c. Have you optimised any hyper-parameters for each ML model? What are they? Why have you done that? Explain.
    d. Finally, make a recommendation based on the reported results and justify it.

5. Build three ensemble models including voting classifier for predicting "target".
    a. When do you want to use ensemble models over other ML models? Explain based on the models that you have used in Q4 and Q5.
    b. What are the similarities or differences between among used ensemble models in Q5?
    c. Is there any preferable scenario for using any specific model among the set of ensemble models? Explain based on obtained outcomes.
    d. Write a report comparing performances of models built in question 4 and 5. Report the best method based on model complexity and performance.
    e. Is it possible to build ensemble model using ML classifiers other than decision tree? If yes, then explain with an example.