

Subject: 19CSE305

Lab Session: 08

Notes:

1. Please read the assignment notes carefully and comply to the guidelines provided.
2. Code should be checked into the GitHub and the report to TurnItIn. Once done, please submit your assignments in Teams.
3. Code non-availability in GitHub shall be marked as zero.
4. Any content copy (statements, figures, codes etc.) from anywhere shall attract a penalty of 10 marks. If you obtain content from anywhere for illustration purposes, please cite the source to avoid penalty.
5. Snapshot / screenshot of code and results not allowed in the report. You may copy content from your own code & results and add to the report.
6. Provide data, code snippets or illustrations to support your answer, as applicable.

Please use the data associated with your own project.

Refer: https://scikit-learn.org/stable/modules/naive_bayes.html

Main Section (Mandatory):

A1. For the data provided below, calculate the prior probability for each class.

age	income	student	credit_rating	buys_computer
<=30	high	no	fair	no
<=30	high	no	excellent	no
31...40	high	no	fair	yes
>40	medium	no	fair	yes
>40	low	yes	fair	yes
>40	low	yes	excellent	no
31...40	low	yes	excellent	yes
<=30	medium	no	fair	no
<=30	low	yes	fair	yes
>40	medium	yes	fair	yes
<=30	medium	yes	excellent	yes
31...40	medium	no	excellent	yes
31...40	high	yes	fair	yes
>40	medium	no	excellent	no

A2. Calculate the class conditional densities for various features & classes. Observe if any class conditional density has zero values.

A3. Test for independence between the 4 given features.

A4. Build a Naïve-Bayes (NB) classifier for the above given data. Below code for help.

```
from sklearn.naive_bayes import GaussianNB  
  
model = GaussianNB()  
  
model.fit(Tr_X,Tr_y)
```

A5. Build a NB classifier for your own project data.

Optional Section:

O1. Study the different parameters that may be passed to GaussianNB() model. Study the various attributes returned after the model is trained.

O2. Study about MultinomialNB() and BernoulliNB() classifiers. Compare their applicability for various datatypes.

Report Assignment:

1. Compare the accuracies of NB classifier with other classifier's obtained on your project data so far. State if you'd use NB classifier for your project data or NOT in the result analysis section of your report.