



Department of CSE (AI & ML)

21AI63- MACHINE LEARNING

IA 3 - Question Bank

Module 2

| SL.NO | QUESTION | COs |
|-------|--|-----|
| 1. | In context to prepare the data for Machine Learning algorithms, Write a note on (i) Data Cleaning (ii) Handling text and categorical attributes iii) Feature scaling | 2 |
| 2. | Using code snippets, outline the concepts involved in i) Measuring accuracy using Cross-Validation. ii) Confusion Matrix. iii) Precision and Recall. | 2 |
| 3. | With the code snippets show how Grid Search and Randomized Search helps in Fine Tuning a model. | 2 |
| 4. | Design a machine learning pipeline for real estate model. | 2 |
| 5. | Explain the steps in end to end machine learning project. | 2 |
| 6. | How to discover and visualize data to gain insights. | 2 |
| 7. | What is data cleaning, explain with suitable example. | 2 |
| 8. | With the code snippet explain how Multilabels classification different from multiclass Multioutput classification? | 2 |

Module 5

| SL.NO | QUESTION | COs |
|-------|---|-----|
| 1. | Explain the concept of Bayes theorem with an example. | 5 |
| 2. | Explain Bayesian belief network and conditional independence with example. | 5 |
| 3. | Explain Brute force MAP hypothesis learner and minimum description length principle. | 5 |
| 4. | Define (i) Prior Probability (ii) Conditional Probability (iii) Posterior Probability | 5 |

| 5. | Explain the concept of EM Algorithm. | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------|---|-------------|----------|-------------|------------|------|------------|----------|-------|-----|--------|----------|----|-----|--------|----------|------|--------|--------|----------|----------|--------|--------|----------|-----|--------|------|----------|------|--------|-----|----------|------|--------|--------|----------|-----|-----|------|----------|--------|--------|--------|----------|----------|------|--------|--------|-----|----|-------|------|------|------|----|----|-------|------|--------|------|-----|-----|------|------|--------|------|-----|-----|-------|------|--------|--------|-----|-----|----------|------|------|--------|-----|-----|----------|-----|--------|------|-----|-----|------|------|------|--------|----|---|
| 6. | Explain Naïve Bayes Classifier with an Example. | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7. | Discuss Maximum Likelihood and Least Square Error Hypothesis. | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8. | Describe Maximum Likelihood Hypothesis for predicting probabilities. | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9. | <p>Apply Naïve Bayes algorithm to classify given instance using below training data.</p> <p>New Instnce:</p> <p><i>{Outlook = sunny, Temperature = cool, Humidity = high, Wind = strong}</i></p> <table><tr><th>Day</th><th>Outlook</th><th>Temperature</th><th>Humidity</th><th>Wind</th><th>PlayTennis</th></tr><tr><td>D1</td><td>Sunny</td><td>Hot</td><td>High</td><td>Weak</td><td>No</td></tr><tr><td>D2</td><td>Sunny</td><td>Hot</td><td>High</td><td>Strong</td><td>No</td></tr><tr><td>D3</td><td>Overcast</td><td>Hot</td><td>High</td><td>Weak</td><td>Yes</td></tr><tr><td>D4</td><td>Rain</td><td>Mild</td><td>High</td><td>Weak</td><td>Yes</td></tr><tr><td>D5</td><td>Rain</td><td>Cool</td><td>Normal</td><td>Weak</td><td>Yes</td></tr><tr><td>D6</td><td>Rain</td><td>Cool</td><td>Normal</td><td>Strong</td><td>No</td></tr><tr><td>D7</td><td>Overcast</td><td>Cool</td><td>Normal</td><td>Strong</td><td>Yes</td></tr><tr><td>D8</td><td>Sunny</td><td>Mild</td><td>High</td><td>Weak</td><td>No</td></tr><tr><td>D9</td><td>Sunny</td><td>Cool</td><td>Normal</td><td>Weak</td><td>Yes</td></tr><tr><td>D10</td><td>Rain</td><td>Mild</td><td>Normal</td><td>Weak</td><td>Yes</td></tr><tr><td>D11</td><td>Sunny</td><td>Mild</td><td>Normal</td><td>Strong</td><td>Yes</td></tr><tr><td>D12</td><td>Overcast</td><td>Mild</td><td>High</td><td>Strong</td><td>Yes</td></tr><tr><td>D13</td><td>Overcast</td><td>Hot</td><td>Normal</td><td>Weak</td><td>Yes</td></tr><tr><td>D14</td><td>Rain</td><td>Mild</td><td>High</td><td>Strong</td><td>No</td></tr></table> | Day | Outlook | Temperature | Humidity | Wind | PlayTennis | D1 | Sunny | Hot | High | Weak | No | D2 | Sunny | Hot | High | Strong | No | D3 | Overcast | Hot | High | Weak | Yes | D4 | Rain | Mild | High | Weak | Yes | D5 | Rain | Cool | Normal | Weak | Yes | D6 | Rain | Cool | Normal | Strong | No | D7 | Overcast | Cool | Normal | Strong | Yes | D8 | Sunny | Mild | High | Weak | No | D9 | Sunny | Cool | Normal | Weak | Yes | D10 | Rain | Mild | Normal | Weak | Yes | D11 | Sunny | Mild | Normal | Strong | Yes | D12 | Overcast | Mild | High | Strong | Yes | D13 | Overcast | Hot | Normal | Weak | Yes | D14 | Rain | Mild | High | Strong | No | 5 |
| Day | Outlook | Temperature | Humidity | Wind | PlayTennis | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D1 | Sunny | Hot | High | Weak | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D2 | Sunny | Hot | High | Strong | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D3 | Overcast | Hot | High | Weak | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D4 | Rain | Mild | High | Weak | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D5 | Rain | Cool | Normal | Weak | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D6 | Rain | Cool | Normal | Strong | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D7 | Overcast | Cool | Normal | Strong | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D8 | Sunny | Mild | High | Weak | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D9 | Sunny | Cool | Normal | Weak | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D10 | Rain | Mild | Normal | Weak | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D11 | Sunny | Mild | Normal | Strong | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D12 | Overcast | Mild | High | Strong | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D13 | Overcast | Hot | Normal | Weak | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D14 | Rain | Mild | High | Strong | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10. | <p>The following table gives data set about stolen vehicles. Using Naïve bayes classifier classify the new data (Red, SUV, Domestic)</p> <p style="text-align: right;">(08 Marks)</p> <p style="text-align: center;">Table</p> <table><tr><th>Color</th><th>Type</th><th>Origin</th><th>Stolen</th></tr><tr><td>Red</td><td>Sports</td><td>Domestic</td><td>Yes</td></tr><tr><td>Red</td><td>Sports</td><td>Domestic</td><td>No</td></tr><tr><td>Red</td><td>Sports</td><td>Domestic</td><td>Yes</td></tr><tr><td>Yellow</td><td>Sports</td><td>Domestic</td><td>No</td></tr><tr><td>Yellow</td><td>Sports</td><td>Imported</td><td>Yes</td></tr><tr><td>Yellow</td><td>SUV</td><td>Imported</td><td>No</td></tr><tr><td>Yellow</td><td>SUV</td><td>Imported</td><td>Yes</td></tr><tr><td>Yellow</td><td>SUV</td><td>Domestic</td><td>No</td></tr><tr><td>Red</td><td>SUV</td><td>Imported</td><td>No</td></tr><tr><td>Red</td><td>Sports</td><td>Imported</td><td>Yes</td></tr></table> | Color | Type | Origin | Stolen | Red | Sports | Domestic | Yes | Red | Sports | Domestic | No | Red | Sports | Domestic | Yes | Yellow | Sports | Domestic | No | Yellow | Sports | Imported | Yes | Yellow | SUV | Imported | No | Yellow | SUV | Imported | Yes | Yellow | SUV | Domestic | No | Red | SUV | Imported | No | Red | Sports | Imported | Yes | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Color | Type | Origin | Stolen | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Red | Sports | Domestic | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Red | Sports | Domestic | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Red | Sports | Domestic | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Yellow | Sports | Domestic | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Yellow | Sports | Imported | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Yellow | SUV | Imported | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Yellow | SUV | Imported | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Yellow | SUV | Domestic | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Red | SUV | Imported | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Red | Sports | Imported | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |