Machine Learning Question Bank

Unit 1 –

1. Describe Linear algebra.
2. Discuss the ways to represent data in linear algebra.
3. Explain operation of linear algebra
4. Illustrate multivariate calculus.
5. Define learning. Explain its types.
6. Define Machine Learning
7. Differentiate between supervised and unsupervised learning.
8. Describe need of feature selection in machine learning model
9. Explain hypothesis space
10. Explain Linear Regression Model in detail
11. Write short note on (i) Train data (ii)Test data
12. Define inductive bias. Discuss its type in details.
13. How to choose the right inductive bias?
14. Explain the different cross-validation techniques
15. What is overfitting? Explain how it can be avoided.
16. Explain model evaluation for classification and regression
17. Describe cross validation.
18. Difference between linear regression and non-linear regression
19. Define sum of square error(SSE)
20. Discuss Gradient Descent in details.
21. Explain Decision Tree.
22. Construct the decision tree for following dataset.

Outlook	Temperature	Humidity	Windy	Play
sunny	hot	high	false	NO
sunny	hot	high	true	NO
overcast	hot	high	false	YES
rainy	mild	high	false	YES
rainy	cool	normal	false	YES
rainy	cool	normal	true	NO
overcast	cool	normal	true	YES
sunny	mild	high	false	NO
sunny	cool	normal	false	YES
rainy	mild	normal	false	YES
sunny	mild	normal	true	YES
overcast	mild	high	true	YES
overcast	hot	normal	false	YES
rainy	mild	high	true	NO

1. Explain following terms
ii. Training Data
iii. Testing Data
iv. Validation Data
v. Underfitting and overfitting
6. Explain Bias and Variance

Unit II–

1. Define instance base learning
2. Discuss Feature Engineering.
3. Describe feature reduction in details
4. Describe need of feature selection in machine learning model

5. Explain Principal component analysis(PCA)
6. Minimize features using PCA for following dataset.

X1	X2
4	11
8	4
13	5
7	14

1. Recall recommendation system
2. Discuss collaborative filtering recommendation system.
3. Explain probability.
4. Discuss Ridge & Lasso Regularization
5. Describe collaborative filtering based recommendation
6. Illustrate the concept of Gaussian Distribution.
7. Explain Gaussian Naïve Bayes.
8. Describe maximum likelihood.
9. Explain Bayesian Parameter estimation.
10. Construct Decision tree for following dataset.

Outlook	Temperature	Humidity	Windy	PlayTennis
Sunny	Hot	High	False	No
Sunny	Hot	High	True	No
Overcast	Hot	High	False	Yes
Rainy	Mild	High	False	Yes
Rainy	Cool	Normal	False	Yes
Rainy	Cool	Normal	True	No
Overcast	Cool	Normal	True	Yes
Sunny	Mild	High	False	No
Sunny	Cool	Normal	False	Yes
Rainy	Mild	Normal	False	Yes
Sunny	Mild	Normal	True	Yes
Overcast	Mild	High	True	Yes
Overcast	Hot	Normal	False	Yes
Rainy	Mild	High	True	No

Unit –III

1. Describe classification supervised machine learning
2. Discuss logistic regression.
3. Draw the graph of sigmoid function.
4. Explain

v. Gradient descent

vi. online Gradient Descent

7. Explain support vector machine classifier.
8. Discuss kernel function in SVM.
9. Define hard margin and soft margin.
10. Define Bias and Variance
11. Summarize Bias Variance tradeoff.